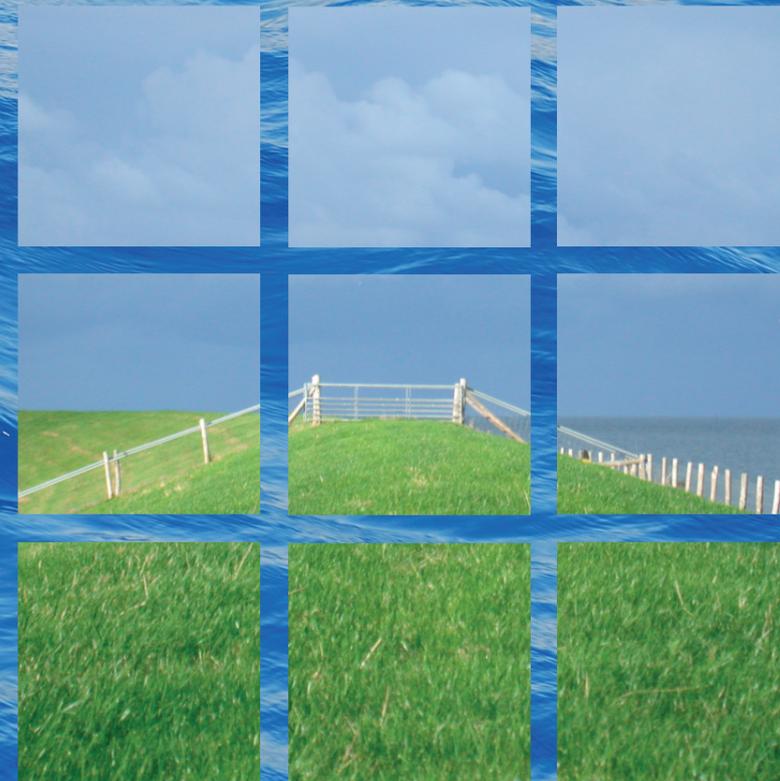


Economic policy instruments and evaluation methods in Dutch water management
Sander Boot

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Sander Boot



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Economic policy instruments and evaluation methods in Dutch water management

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**Economic Policy Instruments and Evaluation Methods
in Dutch Water Management**

An analysis of their contribution to an integrated approach

**Economische beleidsinstrumenten en
evaluatiemethoden in het Nederlandse waterbeheer**

Een analyse van hun bijdrage aan een integrale benadering

Proefschrift
ter verkrijging van
de graad van doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de rector magnificus
Prof.dr. S.W.J. Lamberts
en volgens het besluit van het College van Promoties

de openbare verdediging zal plaatsvinden op
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SUMMARY

PROBLEM STATEMENT AND RESEARCH QUESTIONS

In international water policy, a trend can be observed towards more attention for economic approaches in water management. In 1992, at the International Conference on Water and the Environment (ICWE) in Dublin, the Convention on the Protection and Use of Transboundary Water Courses and International Lakes was adopted. Guiding Principle 4 of this convention states that 'water has an economic value in all its competing uses and should be recognised as an economic good'. The argumentation for this principle states that '...past failure to recognise the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources'. In 1993, the World Bank wrote a policy paper in which it advocated a demand management approach to water management, including the use of economic policy instruments. In 2000, the European water framework directive (WFD) was issued, strongly emphasising sound economic management of water in its Member States. Policy principles, instruments and methods included in the WFD to achieve this are (amongst others) the full cost recovery principle (including environmental and resource costs), the polluter and user pays principles, and economic analyses of human activities with an impact on water systems at the level of river basins and sub-basins. Theoretical benefits of economic approaches¹ towards water management include efficiency in public management, an efficient allocation and use of natural resources, and the possibility of (further) deregulation of water management (leaving a larger part of water management to the market), with an associated flexibility for economic actors in the realisation of public goals.

A major trend in water management at the Dutch national level is going from sectoral towards integrated water management. The latter concept, which was introduced in the 1980s, at first mainly addressed integration of formerly separate aspects of water policy and management (internal integration), and the integration of the policy domain of water with other, related policy domains (external integration). In recent years, the emphasis of integrated water management has shifted outside the political and administrative arena, towards integration with society and the market. Together with an advocated 'dialogue' with water systems, this approach is referred to by Van Ast (2000) as 'interactive water management'. Central aspects of this approach are basing the spatial planning of river basins on the capacities and functioning of water systems and aquatic ecosystems (the water systems approach), stakeholder participation and open planning processes, and transparency of policy and management. This form of water management shows clear parallels with the way the concept of 'sustainability' has been given shape in recent years, through the triptych of 'people, planet, profit'.

¹ The types of economic approaches studied in this thesis are economic policy principles, economic steering instruments, market creation and support, contracts involving financing aspects of water management and economic evaluation methods.

This thesis raises the question what balance is struck between these dimensions of sustainability in making the proposed economic approach to water management operational, via the use of economic steering instruments and evaluation methods. The type of economic approach advocated at the global and EU-level, and the way in which it is made operational at those levels seems to be strongly motivated from an environmental perspective (and thus strongly focused on the 'planet'-dimension of sustainability). Economic policy principles, steering instruments and evaluation methods that aim to integrate the ecological and/or environmental component in economic activities can in theory contribute to filling in integrated water management from this perspective. Examples of such economic elements are the already mentioned policy principles of the European Water Framework Directive, neo-classical economic steering instruments for environmental policy (such as environmental taxes) and economic evaluation methods that include valuing nature and the environment, such as societal, or even ecological cost-benefit analysis. The composed goal of this thesis is to analyse *whether or not* the economic approaches as used by public water managers in The Netherlands contribute to integrated water management, if so, *how* (to what dimension(s) of integrated water management), and *how* this contribution can be *explained*. The *central research question* of this thesis is therefore:

'What role do economic policy instruments and evaluation methods play in integrated water management in The Netherlands?'

This question encompasses a number of sub questions, being:

1. What assumptions does economics make and what conditions does economics raise with regard to the functioning of economic policy instruments and evaluation methods?
2. What are the starting points of integrated water management, how is the concept made operational in Dutch water management, and how are economic policy instruments and evaluation methods embedded in this policy domain?
3. What contribution can economic steering instruments and evaluation methods make in theory to the implementation of the concept of 'integrated water management' and what contribution do they make in the practice of Dutch water management?
4. How can the role economic steering instruments and evaluation methods play in Dutch water management be explained?

In answering these questions, this thesis uses the following working hypotheses:

- In formulating policy, various actor coalitions have varying goals they aim to achieve by implementing economic steering instruments and evaluation methods;
- International policy acts as a framework for Dutch water policy and management, but this framework is made operational largely at the national or lower level. During this process, the actors involved can, to a certain degree, give their own interpretation to this international framework;
- The process of making the policy framework concrete and operational is strongly influenced by trends in society and governance.

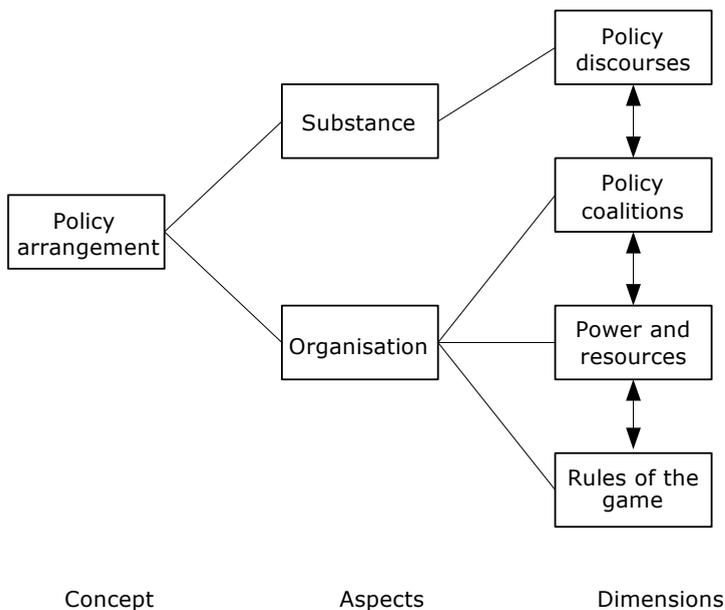
The research object of this thesis is 'policy arrangements' (see the analytical framework for an explanation) in which various types of economic instruments and evaluation methods are involved. The types of economic instruments studied in this thesis include neoclassical

economic steering instruments (such as environmental taxes²) on the one hand and decentral, location-specific arrangement based on contracts on the other. The latter category of arrangements applies insights from new institutional economic theory. As far as economic evaluation methods are involved, this thesis focuses on societal cost-benefit analysis.

ANALYTICAL FRAMEWORK

In order to be able to answer each of the sub questions of this thesis, but especially the fourth (the explanatory question), a theoretical framework was developed, in which the analytical concept of 'policy arrangements' is the central element. Policy arrangements are defined as 'the substantial and organisational stabilisation of a policy domain'. Policy arrangements consist of the elements 'discourse', 'actors', 'power and resources' and 'rules of the game' (institutions) and their mutual relationships. The concept and its elements (dimensions) are schematically represented by figure S1 below.

Figure S.1: schematic representation of a policy arrangement, its aspects and dimensions



(Source: Van Tatenhove et al., 2000: 56)

² With regard to neoclassical economic steering instruments, a distinction can be made between instruments giving a positive incentive to the target group (such as subsidies and other forms of market support) and instruments giving a negative incentive (such as environmental levies). This thesis only discusses neoclassical steering instruments giving a negative incentive.

The concept of policy arrangements can be used to reconstruct processes of decision-making with regard to policy issues. In order to be able to use the concept for the purpose of this thesis (analysis of *factors* that influence the role economic steering instruments and evaluation methods play in Dutch water management), its dimensions were made operational. In this process, special attention was paid to the elaboration of the dimensions 'discourse' and 'actor coalitions', because of their importance with regard to the scope of the analytical framework. The 'discourse' dimension was elaborated by specifying the influence of exogenous factors on this discourse. Exogenous factors are independent phenomena that only play a role in an arrangement as soon as they become part of discourse. Examples of such exogenous factors are trends in society, natural scientific phenomena, and trends in public management. The dimension of 'actor coalitions' was elaborated by involving the perceptions, interests, motives and strategies of individual actors in analysis. These characteristics of individual actors can serve to explain the behaviour of these actors. After having added these elaborations of two dimensions, three levels of factors can be distinguished that may influence the application and scope of economic steering instruments and evaluation methods in Dutch water management: the level of exogenous factors that influence both substances and organisation of the arrangement, the level of interaction between dimensions of the policy arrangement, and the level of individual actors that exert their influence on the arrangement via the dimension of 'actor coalitions'. The elaborations made to the analytical concept allow for a comprehensive analysis of possible factors. In this thesis, the elaborated analytical framework is referred to as 'meta-model for policy analysis'.

In order to be able to perform a more specific analysis of factors that influence the design, application and scope of economic steering instruments and evaluation methods in Dutch water management, the characteristics of the elements of the analytical framework and their mutual relationships were specified in more detail and subsequently categorised. For example, for private actors, a distinction is made between 'dwellers' and 'nomads'. This kind of distinction can provide insight in the motives of various actors and can thus provide an explanation for the position they take with regard to the design and scope of economic steering instruments and evaluation methods in water management. A similar type of reasoning can be applied to the other elements of the analytical framework. Table T1 below provides an overview of the most important factors, their categories and characteristics. In the empirical part of this thesis, policy arrangements are typified by using these categories and characteristics.

Table T1: overview of aspects and characteristics for each dimension of the analytical framework

Dimension	Aspect	Characteristics
Discourse	General	Type of discourse (ontological, normative or strategic?); Level (international, national, regional, local); Arenas (societal, scientific, political, administrative); Degree of consensus in arenas and discourses; Existence and stability of dominant discourse; Type of discourse (emphasis on similarities or differences?); About which goal? Focus (ecological, economic, social aspects, combination?); <i>Important discourses</i> : scale and time; Interpretation of integrated water management; Consequences of exogenous factors; Economic approach? (normative discourse); Selection criteria (esp. efficiency) and optimisation; (Institutionalisation of) Economic steering instruments and evaluation methods; Suitability of instruments and methods for integrated water management;
	Interpretation of policy issue	F.e. effects of society on environment and v.v.; matters of time and scale; spatial variation and differentiation; 'age' of issue;
	Impulses for change	Exogenous factors (societal and natural scientific trends, trends in governance, shock events); Endogenous factors (changes in Dutch water management);
Institutions	General	Degree of institutionalisation issue/dominant discourse; Type of institutions involved (formal, informal, process or content, general or specific); Institutions that regulate use of natural resources (institutional resource regime); Paradigms; Level at which institutions function; Flexibility (windows of opportunity); <i>Important institutions</i> : formal institutions: political rules (laws, norms), economic rules (a.o. property rights), contracts, elements of policy (such as policy principles); Informal institutions: paradigms, informal rules about the process;
	Policy for the issue	History of public policy; Phase in policy cycle; Number of policy alternatives; Primary and secondary policy goals; Position of issue on political agenda; Level at which policy is made and executed; Degree of concordance between intended policy and present policy; Stability of present arrangement; Effect of proposed economic steering instrument or evaluation method on present arrangement
	Decision-making process	Style of policymaking and execution and related consequences;
Actor coalitions	Actors	Number of actors; Degree of organisation/representation; Belief systems; Interests; Goals, Motives; Position wrt. economic instrument or method;
	Actor coalitions	Existence of coalitions; Degree of organisation of coalitions; Degree of concordance of interests and strategies;
Power and resources	Resources (general)	Distribution of resources; Influence of exogenous factors on distribution and use of resources; Crucial/dominant resources? Important resources: institutions, information, story lines, financial means, protest;

	Strategy (of actor coalitions)	Risk strategy; Strategic use of resources; Focus of resources on aspect of arrangement (discourse, institutions, relationships)
	Story lines	Use of concepts and other elements of policy in story lines; Focus in story lines (technical/political suitability, required institutions, fundamental or pragmatic arguments); Use of paradigms
	Power	Power balance (distribution of power in process) as a consequence of the combination of elements above; What dimensions of the arrangement determine power balance?

The role economic steering instruments and evaluation methods play in Dutch water management (and as a consequence the contribution they make to integrated water management) can be characterised by means of two categorisations. The first related to the degree to which the instrument/method is aimed at sustainability in general and each of its dimensions (economic, ecological or social) in particular. The second relates to the level at which an arrangement aims to approach the issue at hand. This level can be an indication for the degree to which one or more issues are addressed at the same time, in an integrated manner. Dietz (2000: 239) distinguishes the following four levels in a layered institutional structure of policy approach:

- Level 1: informal institutions (culture);
- Level 2: formal institutions (rules of the game);
- Level 3: organisation (game concept: governance and management);
- Level 4: allocation (actual behaviour).

As a rule of thumb, it can be stated that the higher the level, the more integrated the approach will be. This, however, does not mean that the highest level is always the most suitable level at which to approach an issue.

STRUCTURE OF THE EMPIRICAL PART

The empirical section of this thesis is divided into 2 parts. Chapter 4 describes a number of generic factors that may influence the application of economic steering instruments and evaluation methods in specific arrangements in Dutch water management. This concerns both factors that influence the organisation of the decision-making process (and through it the organisation and substance of the arrangement) and factors that influence the substance (the discourse). Generic here means that these factors (may) apply to more than one (type of) policy arrangement. These generic factors consist of, for example, European water policy and general trends in society and public governance that are not specific for water management. These elements are predominantly part of the institutional dimension of policy arrangements. Chapters 5 and 6 analyse a number of specific governance arrangements that involve (proposals for) the application of economic steering instruments and evaluation methods in water systems management. The results of chapter 4 act as a framework for the description and analysis of these arrangements. Besides an arrangement involving a societal cost benefit analysis (SCBA), chapters 5 and 6 describe arrangements involving economic steering instruments (see table T2 below).

Table T2: economic steering instruments involved in the arrangements described in the empirical part

Aspect of water management	Governance arrangement	
	Central	Decentralised
Water quantity management	Ground water charge Surface water charge	Blue services for water quantity management PPP*-arrangements for water quantity management
Water quality management	Pollution charge (SWPA-charge) for point sources Agricultural charges (pesticide-charge, nutrient charge, pollution charge on diffuse pollution from agriculture) Charges for diffuse sources of pollution, other than agricultural	Blue services for water quality management
Water quantity and quality management combined	See discussion below	Blue services for integrated water management PPP-arrangements for spatial projects (such as the Blauwe Stad)

*PPP, public private partnership; SWPA, surface water pollution act

From the table above, the following categories can be retrieved: water systems quality versus quantity management and central versus decentralised instruments and arrangements. Besides these categories, a distinction is made between economic steering instruments and evaluation methods. The distinction between water quality and quantity management is a usual categorisation in former sectoral water management. Because many dimensions of existing policy arrangements are based on this distinction, it is maintained for analytical reasons³. The distinction between central and decentralised arrangements is based on the distinction between arrangements involving generic, neoclassical steering instruments on the one hand and location bound arrangements in which contracts (inter-individual agreements) play a role on the other. The recent attention for decentralised, location bound arrangements is the result of a combination of external factors, such as a change in the way of thinking about the way to approach issues in water management and public management in general. The distinction between steering instruments and evaluation methods is a consequence of steering philosophy: public management can realise public facilities itself (to which apply economic evaluation methods) or can influence private parties to realise public goals (to which, besides economic evaluation methods, apply economic steering instruments). Arrangements in water quantity management are described in chapter 5, arrangements in water quality management in chapter 6. In chapter 7, the above-mentioned categories are compared by means of the analytical framework (meta-analysis). The purpose of this exercise was to identify themes and patterns with regard to factors that influence the

³ Off course, a strict separation of water quality and quantity management runs counter to the philosophy of integrated water management.

choice for steering instruments and evaluation methods and the way they are designed. In other words, this analysis aims to determine the degree of 'generalisability' of the findings with regard to the individual (categories of) arrangements.

The economic evaluation method described in this thesis is a societal cost-benefit analysis (SCBA) of a fictitious large-scale project the central government has launched with regard to the policy concept of 'Room for the river'. The arrangement involving this method can be indicated as a central arrangement. As far as the analysis of arrangements for water quality management is concerned, the emphasis was on diffuse pollution as opposed to point source pollution.

RESULTS, DISCUSSION AND CONCLUSIONS

ANALYSIS OF GENERIC FACTORS

The analysis in chapter 4 shows that water policy at the international and national level is often formulated in terms of high ecological ambitions. These ambitions can be shared under the 'planet'-dimension of sustainability. The policy principles that are linked to these ambitions at the international and national level are to a large extent the same. The more water policy is made operational at lower levels of governance, the more these ecological goals have to compete with different types of goals, belonging to either or both of the other two dimensions of sustainability (people and profit). Many of these goals are not even motivated from the perspective of sustainability. Partly, these 'other' goals originate from higher levels of public management and are based on, or in concordance with, general goals of (and trends in) public governance, such as deregulation, efficient public management, transparency and participation. These trends in public governance are indicated as 'political modernisation'.

As shows from the analysis of arrangements in chapters 5 and 6, these trends in public governance are, consciously or unconsciously, used as an argument to design steering instruments and evaluation methods in a specific way. Policy instruments that are designed from the perspective of 'efficient public management' (the secondary goal) are often less focused on achieving the policy goal for which they were originally proposed (the primary goal). The policy principles and strategy chosen thus depends on the result of a process of prioritising policy goals. In Dutch water management, the emphasis in this respect was more on representing sectoral, economic interests and efficient public management than on ecological starting points. As a consequence, the economic instruments proposed were not allowed to have a strong negative impact on target groups, which meant that ecological goals were often flawed. Evaluation methods often concentrated on limiting government expenditure (public costs), while the benefits of this expenditure played a subsidiary role.

The influence of EU-policy on Dutch water management is twofold. On the one hand, the influence of goals in water and environmental policy is felt, which are mainly based on ecological insights and principles. On the other hand, EU-policy influences water management in its Member States from the perspective of 'sound public management' and rules for the EU-internal market. These goals often conflict and compete in making water

management operational in the Member States. Arrangements that from an ecological perspective, and sometimes even from an economic and social perspective, can be indicated as optimal (best practicable) may hit the barrier of EU-criteria for the internal market, such as those regarding government support and a level playing field. Occasionally, arrangements are even rejected from the perspective of guidelines for the elaboration of EU-water or environmental policy, even if the proposed arrangement is a more sophisticated arrangement than the one chosen by the EU (such was the case for the MINAS-system for nutrient management from agricultural sources). Uniformity of water and/or environmental policy in all Member States is the criterion for this judgement. Finally, the economic steering instruments and evaluation methods as suggested or prescribed at EU-level often serve sound public management instead of the purpose of achieving ecological or socio-economic policy goals.

On the basis of the analysis made in chapter 4, the working hypotheses as formulated earlier can be confirmed.

CONCLUSIONS WITH REGARD TO THE 'INTEGRATIVENESS' OF THE ARRANGEMENTS

This thesis poses the question what contributions economic steering instruments and evaluation methods make to integrated water management and how these contributions can be explained. Integrated water management in this thesis is interpreted as an approach to water management based on:

- Weighing all effects of activities;
- Balancing all related interests;
- Attention for internal and external integration, including interaction;
- A comprehensive systems approach.

The three types of arrangements as discussed in this thesis were judged with regard to the degree to which they meet these criteria for integrated water management. The results of this judgement are described below, structured according to the criteria. The general theme for judging these arrangements with regard to these criteria is the balance between the ecological, social and economic dimension of sustainability.

All effects

With regard to this criterion, it can be stated that generic economic steering instruments aim to integrate the effects of economic activities on nature/the environment (the ecological dimension of sustainability) in decision-making by economic actors. Target groups of these instruments mainly point at the (in their perception) negative effects of these instruments on the socio-economic dimension of sustainability and at the limited degree to which these dimensions are taken into consideration. Due to institutional limitations, options for this are limited. It can be concluded that the focuses of government and target groups with regard to aspect of sustainability do not match.

Contrary to central arrangements, decentralised arrangements, due to their flexibility with regard to process and content of the arrangement, have the potential to pay attention to all

types of effects of the arrangement and to make a balanced decision with regard to these types of effects. However, the degree to which this happens strongly depends on the design of the decision-making process, based on the power balance between and the intentions of the actors involved. Due to the limited degree of institutionalisation of the decision-making process, limited guarantees exist for such balanced decision-making to date.

The arrangement in which decision-making takes place about flood prevention aims to weigh the ecological, social, and economic effects of alternative strategies in a balanced manner. In this process the societal cost benefit analysis (SCBA) is presented as an integrated evaluation method. The SCBA is increasingly regarded as an integrated evaluation method for all types of effects, while this method can by definition at most measure all economic effects. Moreover, at present, too little scientific and political consensus exists regarding the economic evaluation of 'external effects'. As a consequence not all effects that can potentially be valued economically are included in analysis. Furthermore, a SCBA is a snapshot of economical values. Therefore, the method is not equipped to integrate changing societal preferences in decision-making. The process of institutionalisation of process and content of the SCBA at the national level increased the risk that this method acquires the status of integrated evaluation method. Finally, there seems to be attention mainly for the net effects at the macro level without paying much attention to the distribution of these effects. A good arrangement for the compensation of distributional effects brings along transaction costs, which hardly seem to play a role. In order to be able to deal with changes in the decision-making process regarding long-term, large-scale projects with a considerable societal impact, this thesis introduces the concept of a 'dynamic cost benefit analysis'.

All interests

The weighing of interests is an important discussion point with regard to generic steering instruments. While the desired effect of these instruments is to enhance the ecological interest in economic decision-making, the decision-making process is so unilateral (top-down) and little transparent that stakeholders do not feel automatically represented. Moreover, adversaries think the emphasis is too much on the ecological dimension.

The decision-making process of decentralised arrangements in theory offers the possibility to weigh all interests. In most cases, the government authorities involved try to achieve a proper representation of interest by involving societal organisations and by generally accepted democratic planning processes. However, indirectly and less properly represented stakeholders often do not have a clear view on informal decision-making processes between primary actors and the agreements made between these actors. This is partly due to the lack of transparency of these informal processes and partly due to the less active involvement and limited degree of organisation of these secondary actors.

The line of reasoning for the arrangement 'room for the river' with regard to the criterion 'all interests' is similar to that regarding the criterion 'all effects'. If not all effects are included, not all interests will be balanced either. Important conditions for a balanced weighing of interests are a proper organisation of the process, and institutions that guarantee that the results of this process are actually taken into account in the final political decision-making process. The decision-making process of the *PKB* (spatial planning key decision) seems to offer sufficient possibilities for meeting the first condition (amongst others via information,

public hearings and representation). Whether or not the results of this participation by various actors really play a role in the final political decision-making process is not always obvious.

Internal and external integration

The generic economic steering instruments analysed in this thesis primarily focus on achieving goals in environmental and water policy. Generally, they are focussed on only one well-defined source, substance or group of substances. This is due to the nature of the instruments, which influences the market mechanism regarding a specific economic good. The disadvantage of this characteristic is that this instrument by definition can only regulate one aspect of water management and as such offers no opportunity to realise a combination of water management goals. However, these instruments do offer the opportunity of also realising secondary, more policy goals, for example by applying the revenues of the instrument for innovation of production processes and the greening of the tax system.

Decontrol arrangements have the potential of regulation several aspects of water management in one arrangement. A good example is the combination of water quality measures and retaining water for fighting desiccation. However, not all water management goals at the local level can be combined in one arrangement. Water retention reduces possibilities for peak storage, and peak storage can have negative effects on ecosystems or agricultural activities. Because of these contrasts clear special choices will have to be made. Furthermore, these arrangements offer the opportunity of combining the goals of several policy domains, such as making agriculture sustainable, nature management and preservation of valuable landscapes, stimulating recreation and tourism, and realising goals with regard to housing.

Self-evidently, the arrangement for flood protection in river systems is primarily directed at safety. Because of the dominating importance of this theme, possibilities to achieve other goals in water management are limited. However, the 'room for the river' concept does offer the opportunity to realise goals of other policy domains via multiple land use planning. These goals are comparable to the goals that can be realised through decentralised arrangements. These goals mainly concern the realisation of a robust ecological structure, innovative building concepts in flood plains, creating and managing valuable nature and landscapes, expanding recreational and tourist facilities, and combining traditional forms of land use in the flood plain with blue and green services. However, because of the paramount importance of safety and the institutions introduced to safeguard this aspect, these initiatives for multiple land use planning are often subjected to range of conditions and (thus) limitations.

Comprehensive systems approach

The comprehensiveness of the arrangements is indicated, to some extent, by the previously discussed criteria. To evaluate this criterion more specifically, the arrangements are judged with regard to their level of problem solving. Generic steering instruments mainly focus on the second and fourth level of problem solving (formal institutions and allocation, respectively). With regard to the second level the focus is mainly on redistribution of property rights (due to the starting-point of strong sustainability) and not so much on rules of the game. The weakness of generic steering instruments is that they cannot really bring

about changes at the first and third level. They do bring about changes towards more environmentally friendly behaviour (level four), but this change is not voluntary and therefore superficial. Few possibilities exist to change the process at the third level. It is possible to listen to input by stakeholders but possibilities to incorporate this input in the governance arrangements are limited.

Decentral arrangements can, in theory, pay attention to all four levels of problem solving. The arrangements are not only focused on the outcomes of the process (the allocative effects), but also on the design of the process itself (level three) and framing process and content via formal (level two) and informal (level one) institutions. The higher potential of decentral arrangements for bringing about changes at the first level compared to central arrangements can be attributed to the voluntary participation of private actors and the attention for socio-economic and cultural aspects of existing and new arrangements in the project area. Attention for the process (level 3) is guaranteed by the fact that none of the actors involved possesses absolute power and each of the actors possesses a crucial resource. At the second level, with the present design of these arrangements, few changes in the distribution of property rights seem to take place as yet. Systems for compensation are based on historically grown property rights with regard to the use of the natural use of resources and environmental use space and not on the utilitarian tradition (weighing of interests on the basis of present problems and interests). In other words, the questions whether or not the providers of services have legitimately acquired their property rights and whether or not this distribution of property rights can be maintained from a societal point of view, are hardly raised.

The discourse regarding the SCBA in the scientific arena focuses on the second (formal institutions) and fourth level of problem solving (the effects of these institutions on allocation). In the political and administrative arena, these formal institutions seem to be hardly subjected to discussion. As far as the fourth level is concerned, attention is paid to the allocative effects of institutional actors but the allocative effects on non-institutional actors hardly play a role. Concerning the dominant theme of flood protection, political and administrative circles do pay attention to the interaction between the second and third level of problem solving (process institutions and their effects on the game concept), but less so to the effects of these levels on allocation. Although in the process substantial attention is paid to the requirements of participation and transparency, less attention is paid to the question whether or not this influences the fourth level. Finally, through the concept of 'room for the river', the national water manager aims to achieve a culture change (level one) with regard to flood protection strategies. Taken together, the process and content of the societal cost benefit analysis in its present form does not correspond with the goals formulated in the policy arrangement 'room for the river'.

Résumé

From the analysis and comparison of the arrangements can be concluded that decentral arrangements have a higher potential of meeting the criteria of integrated water management compared to arrangements involving generic steering instruments. However, this should not lead to the conclusion that generic steering instruments are superfluous. First of all, not all issues in water management can be addressed through decentral arrangements. The rule of thumb 'decentral if possible, central if necessary' is appropriate.

Secondly, this type of arrangement is frequently accompanied by fear of the unknown. Thirdly, generic economic steering instruments can make an important contribution to more general (environmental) policy goals, such as greening the economy, greening the tax system, and financing environmental innovations. As far as the societal cost benefit analysis is concerned, it is important that this instrument is not claimed as an integrated evaluation method too readily. A more careful balancing between various types of integrated evaluation methods (including environmental impact analysis and multi-criteria analysis), seems justified.

SAMENVATTING

PROBLEEMSTELLING EN ONDERZOEKSVRAAG

In internationaal waterbeleid kan een trend worden waargenomen van groeiende aandacht voor een economische benadering van waterbeheer. Principe 4 van het Akkoord over Bescherming en Gebruik van Internationale Stroomgebieden en Meren, aangenomen op het Internationale Congres over Water en Milieu in Dublin (1992) stelt: 'Water heeft een economische waarde in al haar concurrerende toepassingen en dient als economisch goed te worden erkend'. De argumentatie hiervoor is dat het niet erkennen van de economische waarde van water in het verleden heeft geleid tot verspillend en milieuschadend gebruik van deze natuurlijke hulpbron. Het behandelen van water als economisch goed is volgens dit akkoord een belangrijke manier om te komen tot een efficiënt en eerlijk gebruik van water en tot behoud en bescherming van waterbronnen. In 1993 schreef de Wereldbank een beleidsstuk waarin het pleitte voor het sturen van de watervraag, o.a. door het gebruik van economische sturingsinstrumenten. In 2000 werd de Europese Kaderrichtlijn Water van kracht, welke een sterke nadruk legde op een degelijke economische beheerbenadering van water in haar lidstaten. Beleidsprincipes en instrumenten om dit te bereiken zijn onder andere het principe van volledige terugwinning van kosten (inclusief de kosten van milieuschade en het gebruik van natuurlijke hulpbronnen), de principes 'de vervuiler betaalt' en 'de gebruiker betaalt', en economische analyses van menselijke activiteiten met consequenties voor het watersysteem op het niveau van stroomgebieden en deelstroomgebieden. Theoretische voordelen (en daarmee doelen) van een economische benadering van waterbeheer zijn onder andere efficiënt waterbeheer, efficiënt gebruik van natuurlijke hulpbronnen en keuzevrijheid voor economische actoren.

Een andere belangrijke trend voor het Nederlandse waterbeheer is de omschakeling van sectoraal naar integraal waterbeheer. Dit concept, dat werd geïntroduceerd in de jaren '80, richtte zich in eerste instantie op de integratie van afzonderlijke aspecten van waterbeleid en -beheer (interne integratie), en de integratie van het beleidsdomein 'water' met andere, gerelateerde beleidsdomeinen, zoals milieu en ruimtelijke ordening (externe integratie). De afgelopen jaren is de aandacht in integraal waterbeheer verschoven van integratie binnen de overheid naar integratie met markt en maatschappij. Deze stap wordt, tezamen met een bepleite 'dialogue' met watersystemen en aquatische ecosystemen, door Van Ast (2000) aangeduid met de term 'interactief waterbeheer'. Centrale elementen van deze benadering zijn het leidend laten zijn van de mogelijkheden van watersystemen en aquatische ecosystemen voor de inrichting van stroomgebieden (watersysteembenadering), participatie van belanghebbenden, open planprocessen en transparantie van beleid en beheer. Deze vorm van waterbeheer toont duidelijke parallellen met de manier waarop de laatste jaren aan het begrip 'duurzaamheid' invulling wordt gegeven, via de trits 'mens, milieu en economie' ('people, planet, profit').

In dit proefschrift wordt de vraag gesteld hoe de balans tussen deze dimensies van duurzaamheid uitvalt in het operationaliseren van de voorgestane economische benadering

in waterbeheer door middel van economische sturingsinstrumenten en evaluatiemethoden. De economische benadering van waterbeheer die op mondiaal en EU-niveau wordt beoogd, en de manier waarop er invulling aan wordt gegeven op dat niveau, lijkt sterk te zijn ingegeven vanuit de invalshoek 'natuur en milieu' (dus vanuit de 'planet'-dimensie van duurzaamheid). Economische beleidsprincipes, sturingsinstrumenten en evaluatiemethoden die zich richten op het integreren van de ecologische en/of milieucomponent in economisch handelen kunnen in theorie bijdragen aan de invulling van integraal waterbeheer vanuit deze invalshoek. Voorbeelden hiervan zijn de reeds genoemde beleidsprincipes van de Europese Kaderrichtlijn Water, klassieke milieueconomische sturingsinstrumenten (zoals milieubelastingen) en economische evaluatiemethoden waarin de waardering van natuur en milieu een rol speelt, zoals de maatschappelijke of, sterker nog, een ecologische kosten-batenanalyse (eco-KBA). Het samengestelde doel van dit proefschrift is te achterhalen of de economische benaderingen zoals publieke waterbeheerders deze in Nederland hanteren inderdaad bijdragen aan integraal waterbeheer, zo ja, *hoe* (aan welke dimensie(s) van integraal waterbeheer), en hoe deze bijdrage te *verklaren* is. De centrale onderzoeksvraag van dit proefschrift luidt derhalve:

'Welke bijdrage leveren economische sturingsinstrumenten en evaluatiemethoden aan integraal waterbeheer in Nederland en hoe kan deze bijdrage worden verklaard?'

Deze vraag omvat een aantal deelvragen, te weten:

1. Welke aannames maakt de economische wetenschap over en welke eisen stelt zij aan het functioneren van economische sturingsinstrumenten en evaluatiemethoden?
2. Wat zijn de uitgangspunten van integraal waterbeheer, hoe wordt het concept operationeel gemaakt in het Nederlandse waterbeheer en hoe zijn economische sturingsinstrumenten en evaluatiemethoden ingebed in dit beleidsdomein?
3. Welke bijdrage kunnen economische sturingsinstrumenten en evaluatiemethoden in theorie leveren aan de implementatie van het concept 'integraal waterbeheer' en welke bijdrage leveren ze hieraan in de praktijk van het Nederlandse waterbeheer?
4. Hoe kan de rol van economische sturingsinstrumenten en evaluatiemethoden in het Nederlandse waterbeheer worden verklaard?

Bij de beantwoording van deze vragen hanteert dit proefschrift de volgende werkhypothesen:

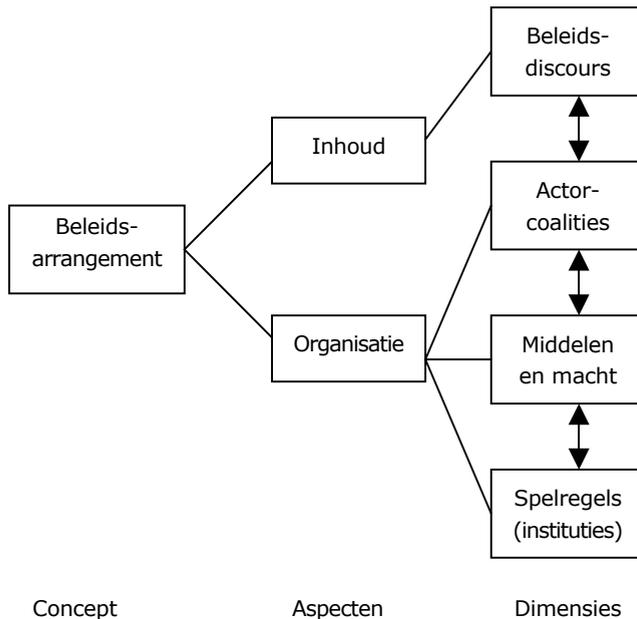
- bij beleidsformulering worden vanuit verschillende beleidskaders andere accenten gelegd met betrekking tot de doelen die met economische instrumenten en methoden worden nagestreefd;
- het internationale beleid vormt een kader voor het Nederlandse waterbeleid en -beheer, maar de invulling van dit kader vindt grotendeels op nationaal of lager niveau plaats. Daarbij kan deels een eigen invulling worden gegeven aan dit internationale kader;
- bij de invulling en uitwerking van dit beleidskader spelen maatschappelijke en bestuurlijke trends een belangrijke rol.

Onderzoeksobject van dit proefschrift zijn bestuurlijke arrangementen (zie analytisch raamwerk) waarin verschillende typen economische instrumenten en evaluatiemethoden een rol spelen. De economische instrumenten die in dit proefschrift worden geanalyseerd omvatten enerzijds generieke, neoklassieke economische sturingsinstrumenten, zoals milieueffingen⁴, en anderzijds decentrale, gebiedsgerichte arrangementen gebaseerd op contracten. De laatste categorie maakt gebruik van inzichten uit de nieuwe institutionele economie. Wat betreft economische evaluatiemethoden concentreert dit proefschrift zich op maatschappelijke kosten-batenanalyse.

ANALYTISCH RAAMWERK

Ten behoeve van de beantwoording van alle deelvragen, maar met name van de vierde deelvraag (de verklarende vraag), is een theoretisch raamwerk ontwikkeld, waarvan het analytisch concept 'beleidsarrangementen' de kern vormt. Beleidsarrangementen zijn gedefinieerd als 'de inhoudelijke en organisatorische stabilisering van een beleidsdomein'. Beleidsarrangementen zijn opgebouwd uit de elementen 'discours', 'actoren', 'macht en middelen' en 'spelregels' (instituties) en hun onderlinge relaties. Het concept en zijn elementen (of 'dimensies') zijn schematisch weergegeven in figuur S1.

Figuur S1: schematische weergave van een beleidsarrangement, haar aspecten en dimensies



(Bron: Van Tatenhove et al., 2000: 56)

⁴ Bij neoklassieke economische sturingsinstrumenten kan sprake zijn van instrumenten met een positieve prikkel (zoals subsidies en marktondersteuning) en instrumenten met een negatieve prikkel (zoals milieueffingen en -belastingen). In dit proefschrift is alleen gekeken naar neoklassieke instrumenten met een negatieve prikkel.

Het concept beleidsarrangementen kan worden toegepast om besluitvormingsprocessen met betrekking tot beleidsvraagstukken te reconstrueren. Om het concept 'beleidsarrangement' te kunnen gebruiken voor het doel van dit onderzoek (analyse van *factoren* die van invloed zijn op de rol die economische sturingsinstrumenten en evaluatiemethoden in het Nederlandse waterbeheer spelen) zijn de dimensies van het concept geoperationaliseerd. Daarbij is geoordeeld dat de uitwerking van de dimensies 'discours' en 'actor coalities' in het bijzonder van belang was voor de reikwijdte van het analytisch raamwerk. De dimensie 'discours' is uitgewerkt door de invloed van exogene factoren op dit discours te specificeren. Exogene factoren zijn op zichzelf staande fenomenen, die pas betekenis krijgen in een arrangement door de rol die ze spelen in het discours. Voorbeelden van 'exogene factoren' zijn trends in de maatschappij, in natuurwetenschappelijke fenomenen en in openbaar bestuur. De dimensie 'actor coalities' is uitgewerkt door ook de denkbeelden, belangen, motieven en strategieën van individuele actoren te betrekken in de analyse. Deze kenmerken van individuele actoren kunnen een verklaring geven voor het gedrag van actoren. Door deze uitwerkingen worden drie niveaus van factoren onderscheiden die van invloed kunnen zijn op de toepassing en reikwijdte van economische sturingsinstrumenten en evaluatiemethoden in het Nederlandse waterbeheer: het niveau van exogene factoren, die via de dimensie 'discours' van invloed zijn op zowel de structuur als de inhoud van het arrangement, het niveau van interactie tussen de dimensies van het beleidsarrangement en het niveau van individuele actoren, die hun invloed uitoefenen via de dimensie 'actor coalities' van het arrangement. Door deze uitwerkingen kan een omvattend beeld worden gegeven van mogelijke factoren. Het model wordt in dit proefschrift aangeduid als 'meta-model voor beleidsanalyse'.

Om gericht onderzoek te kunnen doen naar specifieke factoren die van invloed kunnen zijn op het ontwerp, de reikwijdte en de toepassing van economische sturingsinstrumenten en evaluatiemethoden in het Nederlandse waterbeheer zijn de kenmerken van de elementen van het analytisch raamwerk en hun onderlinge relaties gespecificeerd en gecategoriseerd. Zo wordt bijvoorbeeld bij private actoren onderscheid gemaakt tussen 'blijvers' (*dwellers*) en 'nomaden' (*nomads*). Dit onderscheid kan inzicht verschaffen in de motieven van verschillende actoren en dus een verklaring zijn voor de positie die ze innemen ten aanzien van het ontwerp en de reikwijdte van economische sturingsinstrumenten en evaluatiemethoden in waterbeheer. Een vergelijkbare redenering geldt ook voor andere elementen van het analytisch raamwerk. Onderstaande tabel geeft een overzicht van de belangrijkste factoren, de daarbinnen onderscheiden categorieën en hun kenmerken. In het empirische gedeelte van dit proefschrift worden bestuurlijke arrangementen⁵ getypeerd aan de hand van deze aspecten en kenmerken.

⁵ In dit proefschrift wordt onderscheid gemaakt tussen beleidsarrangementen en bestuurlijke arrangementen. Onder een beleidsarrangement wordt verstaan een arrangement waarbinnen beleidsvorming plaats vindt (en beleid tot stand komt). Onder een bestuurlijk arrangement wordt verstaan een arrangement waarbinnen beleid wordt uitgevoerd.

Tabel T1: Overzicht van aspecten en kenmerken per dimensie van het analytisch raamwerk

Dimensie	Aspect	Kenmerken
Discours	Algemeen	Type discours (ontologisch, normatief, strategisch)? Niveau (internationaal, nationaal, regionaal, lokaal); Arena(s) (maatschappelijk, wetenschappelijk, politiek, ambtelijk); mate van consensus in arena's en discourses; Bestaan en stabiliteit dominant discours; Aard discours (nadruk op overeenkomsten of verschillen?); Over welk doel? Focus (ecologische, economische, sociale aspecten, of een combinatie)?; Belangrijke discourses: schaal en tijd; interpretatie van integraal waterbeheer; gevolgen van exogene factoren; economische benadering (normatieve discours); selectiecriteria (i.h.bijz. efficiëntie) en optimalisatie; (institutionalisering van) economische sturingsinstrumenten en evaluatiemethoden; geschiktheid instrumenten en methoden voor integraal waterbeheer;
	Interpretatie beleid-vraagstuk	Bijv. effecten maatschappij op milieu en v.v.; kwesties van tijd en schaal; ruimtelijke variatie; 'leeftijd' van vraagstuk;
	Impulsen voor verandering	Exogene factoren (maatschappelijke en natuurwetenschappelijke trends, trends in bestuur, rampen/schokkende gebeurtenissen); Endogene factoren (veranderingen in het Nederlandse waterbeheer)
Institutes	Algemeen	Mate van institutionalisering vraagstuk/dominante discours; Type instituties die rol spelen (formeel, informeel, proces of inhoud, algemeen of specifiek); Instituties die gebruik natuurlijke hulpbronnen reguleren (institutional resource regime); Paradigma's; Niveau waarop instituties functioneren; Flexibiliteit (windows of opportunity); Belangrijke instituties: formele instituties: politieke regels (wetten, normen), economische regels (w.o. eigendomsrechten), contracten, elementen van beleid (zoals beleidsprincipes); Informele instituties: paradigma's, informele regels over het proces
	Beleid voor het vraagstuk	Historie van publiek beleid; Fase in de beleidscyclus; Aantal beleidsalternatieven; Primaire en secundaire beleidsdoelen; Positie van vraagstuk op politieke agenda; Niveau waarop beleid wordt gemaakt en uitgevoerd; Mate van overeenstemming van beleidsvoornemen met huidige beleid; Stabiliteit huidige arrangement; Effect van het voorgestelde economische sturingsinstrument of evaluatiemethode op huidige arrangement
	Besluitvormings-proces	Stijl van beleid maken en uitvoeren en de gerelateerde gevolgen
Actor coalities	Actoren	Aantal actoren; Mate van organisatie/vertegenwoordiging; 'Geloofsystemen'; Belangen; Doelen; Motieven; Houding ten aanzien van economisch instrument of methode;
	Actor coalities	Bestaan van coalities; Mate van organisatie coalities; Mate van overeenkomst van belangen en strategieën;

Macht en middelen	Middelen (algemeen)	Concentratie/verdeling van middelen; Invloed van exogene factoren op de verdeling en het gebruik van middelen; Cruciale/dominante middelen? Belangrijke middelen: Instituties, Informatie, Verhaallijnen, Financiële middelen, Protest
	Strategie (van actor coalities)	Risico strategie; Strategisch gebruik middelen; Focus van middelen op aspect van arrangement (discours, instituties, relaties)
	Verhaallijnen	Gebruik van concepten en andere beleidselementen in verhaallijnen; Focus in verhaallijnen (technisch/politieke geschiktheid, benodigde instituties, fundamentele of pragmatische argumenten); Gebruik van paradigma's;
	Macht	Machtsbalans (verdeling van macht in het proces) als gevolg van de combinatie van bovenstaande elementen; Welke dimensies van het arrangement bepalen de machtsbalans?

De rol die economische sturingsinstrumenten en evaluatiemethoden spelen in het Nederlandse waterbeheer (en daarmee hun bijdrage aan integraal waterbeheer) wordt in dit proefschrift gekarakteriseerd aan de hand van twee indelingen. De eerste indeling betreft de mate waarin het instrument/de methode zich richt op duurzaamheid in het algemeen en de verschillende dimensie(s) van duurzaamheid (economische, ecologische en/of sociale) in het bijzonder. De tweede indeling betreft het systeemniveau waarop via het betreffende arrangement wordt beoogd het vraagstuk aan te pakken. Dit niveau kan een indicatie zijn voor de mate waarin één vraagstuk of zelfs meerdere vraagstukken tegelijk op een integrale wijze benaderd wordt/worden. Dietz (2000: 239) onderscheidt in een gelaagde institutionele structuur van probleemaanpak de volgende vier niveaus:

- niveau 1: informele instituties (cultuur)
- niveau 2: formele instituties (spelregels)
- niveau 3: organisatie (spelconcept: bestuur en beheer)
- niveau 4: allocatie (spelgedrag)

Met betrekking tot deze indeling kan de volgende vuistregel worden gehanteerd: hoe hoger het niveau, hoe integraler de benadering. Dit wil echter niet zeggen dat het hoogste niveau altijd het meest geschikte niveau van probleembenadering is.

OPZET EMPIRISCH GEDEELTE

Het empirisch gedeelte van dit proefschrift is opgedeeld in 2 delen. Hoofdstuk 4 beschrijft een aantal generieke factoren die van invloed kunnen zijn op de toepassing van economische sturingsinstrumenten en evaluatiemethoden in specifieke arrangementen in het Nederlandse waterbeheer. Het betreft zowel factoren die de structuur van het besluitvormingsproces (en daarmee van het arrangement) beïnvloeden als factoren die de inhoud (het discours) beïnvloeden. Met generiek wordt bedoeld dat deze factoren van invloed (kunnen) zijn op meer dan één (type) beleidsarrangement. Het betreft elementen als Europees waterbeleid en algemene trends in maatschappij en openbaar bestuur die niet specifiek zijn voor waterbeheer. Deze elementen maken met name deel uit van de dimensie 'instituties'. Hoofdstukken 5 en 6 beschrijven vervolgens een aantal specifieke bestuurlijke arrangementen waarbij sprake is van (voorstellen voor) toepassing van economische sturingsinstrumenten en evaluatiemethoden in het watersysteembeheer. De resultaten uit

hoofdstuk 4 dienen als kader voor de beschrijving en analyse van deze arrangementen. In hoofdstukken 5 en 6 zijn, naast het arrangement van een MKBA, arrangementen van de volgende economische sturingsinstrumenten beschreven:

Aspect van waterbeheer	Bestuurlijk arrangement	
	Centraal	Decentraal
Waterkwantiteit-beheer	Grondwaterheffing Oppervlaktewaterheffing	Blauwe diensten voor water kwantiteitbeheer PPS-arrangementen voor water kwantiteitbeheer (LEI-studie)
Waterkwaliteit-beheer	Verontreinigingsheffing (<i>WVO-heffing</i>) voor puntbronnen Landbouwheffingen (pesticiden, mestheffing, verontreinigingsheffing op diffuse verontreiniging uit de landbouw) Heffingen op diffuse bronnen, anders dan landbouw	Blauwe diensten voor waterkwaliteitbeheer
Water kwantiteit- en kwaliteitbeheer gecombineerd	Zie discussie	Blauwe diensten voor integraal waterbeheer PPS-arrangementen voor ruimtelijke projecten (zoals de Blauwe Stad)

Uit bovenstaande tabel is de volgende indeling in categorieën te herleiden: waterkwaliteitbeheer versus waterkwantiteitbeheer en centrale versus decentrale instrumenten en arrangementen. Daarnaast wordt onderscheid gemaakt tussen economische sturingsinstrumenten en evaluatiemethoden. Het onderscheid tussen waterkwaliteitbeheer en waterkwantiteitbeheer is een gebruikelijke indeling in het voormalige sectorale waterbeheer. Omdat veel dimensies van bestaande beleidsarrangementen op dit onderscheid zijn gebaseerd is dit onderscheid om analytische redenen in stand gehouden. Het onderscheid tussen centrale en decentrale arrangementen is gebaseerd op het onderscheid tussen arrangementen met generieke, neoklassieke sturingsinstrumenten enerzijds en gebiedsgerichte arrangementen waarin contracten (inter-individuele afspraken) een rol spelen anderzijds. De recentere aandacht voor decentrale, gebiedsgerichte arrangementen komt voort uit een combinatie van externe factoren, zoals een veranderend denken over de aanpak van vraagstukken in het waterbeheer en over overheidssturing in het algemeen. Het onderscheid tussen sturingsinstrumenten en evaluatiemethoden is een uitvloeisel van sturingsfilosofie: de overheid kan zelf publieke voorzieningen realiseren (op deze lijn zijn economische evaluatiemethoden van toepassing) of private partijen aansturen om publieke doelen te behalen (op deze lijn zijn, naast economische evaluatiemethoden (evaluatie van beleid), ook economische sturingsinstrumenten van toepassing). Arrangementen in waterkwantiteitbeheer zijn beschreven in hoofdstuk 5, arrangementen in waterkwaliteitbeheer in hoofdstuk 6. In hoofdstuk 7 zijn de bovengenoemde categorieën met elkaar vergeleken aan de hand van het analytische raamwerk (meta-analyse). Doel van deze vergelijkende studie was het achterhalen van thema's en patronen met betrekking tot factoren die de keuze van sturingsinstrument of evaluatiemethode en de invulling ervan

beïnvloeden. Er is, met andere woorden, gekeken naar de mate van generaliseerbaarheid van de bevindingen ten aanzien van individuele (categorieën van) arrangementen.

De economische evaluatiemethode die in dit proefschrift wordt beschreven betreft een maatschappelijke kosten-batenanalyse (MKBA) van een fictief grootschalig ruimtelijk project dat door de rijksoverheid is geïnitieerd in het kader van het beleidsconcept Ruimte voor de Rivier. Het arrangement rond deze methode kan worden aangeduid als een centraal arrangement. Wat betreft de analyse van arrangementen voor waterkwaliteitbeheer waarin generieke economische sturingsinstrumenten zijn voorgesteld dan wel toegepast lag de focus in dit proefschrift op diffuse verontreiniging (en niet op verontreiniging door puntbronnen).

RESULTATEN, DISCUSSIE EN CONCLUSIES

ANALYSE ALGEMENE FACTOREN

Uit de analyse in hoofdstuk 4 blijkt dat waterbeleid op internationaal en rijksniveau vaak wordt geformuleerd in termen van hoge ecologische ambities. Deze ambities kunnen gerekend worden tot de dimensie 'milieu' (planet) van het concept duurzaamheid (zie eerder). De beleidsprincipes die aan deze ambities gekoppeld worden op internationaal en rijksniveau komen in grote mate met elkaar overeen. Naarmate het waterbeleid verder wordt geoperationaliseerd op lagere bestuurlijke niveaus, moeten de ecologische doelstellingen meer en meer concurreren met andersoortige doelstellingen, die hetzij behoren tot de andere dimensies van het concept duurzaamheid ('mens' en 'economie'), hetzij überhaupt niet vanuit een duurzaamheidsgedachte geformuleerd zijn. Deels zijn deze doelstellingen afkomstig van hogere overheidsniveaus en gebaseerd op of in overeenstemming met algemene doelstellingen van (en trends in) openbaar bestuur, zoals deregulering, efficiënt publiek bestuur, transparantie en participatie. Deze trends in openbaar bestuur worden in dit proefschrift aangeduid als 'politieke modernisering'.

Zoals blijkt uit analyse van de arrangementen in hoofdstukken 5 en 6 worden deze bestuurlijke trends vaak bewust of onbewust als argument gebruikt om instrumenten en evaluatiemethoden op een specifieke manier vorm te geven. Zo zijn beleidsinstrumenten die zijn vormgegeven vanuit het motief 'efficiënt publiek bestuur' (een secundaire doel) vaak minder gericht op het behalen van het beleidsdoel waarvoor ze oorspronkelijk bedoeld waren (het primaire doel). Welke beleidsprincipes en -lijnen worden gehanteerd hangt dus af van de uitkomst van een proces van prioritering van beleidsdoelen. In het Nederlandse waterbeheer lag daarbij de afgelopen jaren de nadruk meer op het behartigen van sectorale, economische belangen en op efficiënt publiek bestuur dan op ecologische uitgangspunten. Dit had tot gevolg dat economische sturingsinstrumenten niet te negatieve consequenties mochten hebben voor doelgroepen, als gevolg waarvan ecologische doelen vaak werden afgezwakt. Evaluatiemethoden concentreerden zich vaak op het beperken van overheidsuitgaven (publieke kosten), terwijl de baten van deze overheidsuitgaven een ondergeschikte rol speelden.

De invloed van EU-beleid op het Nederlandse waterbeheer is tweeledig te noemen. Enerzijds is er de invloed van doelstellingen uit het water- en milieubeleid, welke voornamelijk zijn

gebaseerd op ecologische inzichten en principes, anderzijds oefent het EU-beleid invloed uit vanuit algemene principes van behoorlijk bestuur in haar lidstaten en vanuit regels voor de EU-interne markt. Deze doelstellingen zijn vaak tegenstrijdig aan elkaar en beconcurreren elkaar in de operationalisering van waterbeheer in de lidstaten. Arrangementen die vanuit een ecologische invalshoek, en soms zelfs vanuit een economische en sociale, als optimaal (best haalbaar) kunnen worden aangemerkt, stranden dikwijls op de EU-criteria voor de interne markt, zoals staatssteun en een gelijk speelveld ('level playing field'). Een enkel arrangement wordt zelfs door de EU afgekeurd op basis van richtlijnen voor de uitwerking van water- of milieubeleid, ook als het een intelligenter of subtieler arrangement is dan door de EU voorgestaan (zoals bij de MINAS-systematiek). Uniformiteit van water- en/of milieubeleid in alle lidstaten ligt aan deze beoordeling ten grondslag. Daarnaast staan economische instrumenten en evaluatiemethoden zoals gesuggereerd of voorgeschreven op EU-niveau vaak in het teken van degelijk publiek financieel management, en niet van het behalen van ecologische of socio-economische beleidsdoelen.

Op basis van bovenstaande analyse kunnen de werkhypothesen worden bevestigd.

CONCLUSIES MET BETREKKING TOT DE INTEGRALITEIT VAN DE ARRANGEMENTEN

Dit proefschrift stelt de vraag welke bijdrage economische sturingsinstrumenten en evaluatiemethoden leveren aan integraal waterbeheer en hoe deze bijdrage kan worden verklaard. Integraal waterbeheer is in dit proefschrift opgevat als een benadering van waterbeheer waarbij uitgegaan wordt van:

- weging van alle effecten van activiteiten;
- weging van alle gerelateerde belangen, inclusief interactie met markt en maatschappij;
- aandacht voor interne en externe integratie;
- een systeemomvattende benadering.

De drie verschillende typen arrangementen zijn beoordeeld op de mate waarin zij aan deze aspecten van integraal waterbeheer voldoen. Overkoepelend thema voor deze aspecten is de balans tussen de ecologische, sociale en economische dimensie van duurzaamheid.

Alle effecten

Wat betreft het rekening houden met alle effecten van activiteiten kan worden gesteld dat generieke sturingsinstrumenten tot doel hebben effecten van economische activiteiten op natuur en milieu (de ecologische dimensie) te integreren in beslissingen van economische actoren. Doelgroepen van deze instrumenten wijzen met name op de (in hun ogen) negatieve effecten van deze instrumenten op de socio-economische dimensie van duurzaamheid en op de beperkte mate waarin met deze socio-economische effecten rekening wordt gehouden. Vanwege institutionele belemmeringen zijn de mogelijkheden hiertoe ook beperkt. De focus van overheid en doelgroepen met betrekking tot duurzaamheid komt dus niet overeen.

In tegenstelling tot centrale arrangementen hebben decentrale arrangementen, vanwege de flexibiliteit met betrekking tot proces en inhoud van het arrangement, de potentie om

aandacht te besteden aan alle typen effecten van het arrangement en een evenwichtige afweging te maken tussen deze typen effecten. De mate waarin dit gebeurt hangt sterk af van de vormgeving van het besluitvormingsproces, gebaseerd op de machtsbalans tussen en de intenties van belangenhebbende actoren. Vanwege de beperkte mate van institutionalisering van het besluitvormingsproces bestaan er tot op heden beperkte garanties op een dergelijke evenwichtige afweging.

Het arrangement waarbinnen de besluitvorming plaatsvindt over benadering van de hoogwaterproblematiek beoogt een evenwichtige afweging te maken tussen ecologische, sociale en economische effecten van alternatieve strategieën. In dit proces wordt de MKBA gepresenteerd als integrale evaluatiemethode. Daarbij wordt de MKBA in toenemende mate gezien als integrale evaluatiemethode voor alle type effecten, terwijl deze methode per definitie hooguit alle economische effecten kan waarden. Bovendien is er nog te weinig wetenschappelijke en politieke consensus over de economische waardering van 'externe effecten', waardoor tot op heden ook niet alle potentieel economisch te waarden effecten worden gewogen. Ten derde is de MKBA een momentopname van economische waarden. De methode is daarom niet goed uitgerust om veranderende maatschappelijke voorkeuren in de besluitvorming te integreren. Door institutionalisering op rijksniveau van proces en inhoud van de MKBA bestaat echter het risico dat deze methode de status krijgt van integrale evaluatiemethode. Tenslotte lijkt er vooral oog te zijn voor het saldo van effecten op macroniveau, zonder veel aandacht te besteden aan de verdeling van effecten. De transactiekosten die een goed arrangement voor de compensatie van verdelingseffecten met zich meebrengt spelen nauwelijks een rol. Om bij besluitvorming over langdurige projecten met grote maatschappelijke consequenties rekening te kunnen houden met veranderingen is in dit proefschrift het concept van de dynamische kosten-batenanalyse geïntroduceerd.

Alle belangen

Het wegen van belangen is een belangrijk discussiepunt met betrekking tot generieke sturingsinstrumenten. Terwijl het beoogde effect van de instrumenten is dat het ecologische belang een grotere rol krijgt in economische beslissingen, is het besluitvormingsproces dusdanig eenzijdig (top-down) en ondoorzichtig dat belanghebbende actoren zich niet automatisch vertegenwoordigd voelen. Bovendien vinden tegenstanders dat de nadruk te eenzijdig ligt op de ecologische dimensie, en dat deze onevenredig wordt benadrukt.

Het besluitvormingsproces van decentrale arrangementen biedt in theorie de mogelijkheid alle belangen te wegen. In de meeste gevallen wordt door betrokken overheden getracht via het betrekken van maatschappelijke organisaties en via geïnstitutionaliseerde algemeen-democratische (plan-)processen een goede vertegenwoordiging van belangen te krijgen. Dit neemt niet weg dat indirect en minder goed vertegenwoordigde belanghebbenden vaak slecht zicht hebben op het informele besluitvormingsproces tussen primaire actoren en de afspraken die tussen deze actoren worden gemaakt. Deels is dit te wijten aan het gebrek aan (institutionalisering van de) transparantie van deze informele processen, en deels aan de minder actieve opstelling en beperktere organisatiegraad van indirecte (secundaire) actoren.

De redenering voor het arrangement 'ruimte voor de rivier' met betrekking tot dit aspect van integraliteit (alle belangen) ligt in het verlengde van het vorige aspect (alle effecten). Als niet

alle effecten worden gewogen, worden ook niet alle belangen afgewogen. Belangrijke voorwaarden voor het maken van een gebalanceerde afweging van belangen in de besluitvorming zijn de inrichting van het besluitvormingsproces en instituties die garanderen dat de inhoudelijke uitkomsten van dit proces daadwerkelijk worden meegenomen in de uiteindelijke politieke besluitvorming. Het besluitvormingsproces van de PKB lijkt voldoende mogelijkheden te bieden voor het voldoen aan de eerste voorwaarde (middels onder andere voorlichting, inspraak en vertegenwoordiging). Dat de uitkomsten van deze participatie van verschillende actoren ook daadwerkelijk een rol spelen in de uiteindelijke politieke besluitvorming is echter niet altijd vanzelfsprekend.

Interne en externe integratie

De generieke economische sturingsinstrumenten die in dit proefschrift zijn geanalyseerd richten zich primair op doelen in milieu- en waterbeleid. Over het algemeen zijn ze echter gericht op slechts één goed afgebakende bron, stof of groep van stoffen. Dit is te wijten aan de aard van het instrument, dat ingrijpt in het marktmechanisme van een (specifiek) economisch goed. Nadeel hiervan is dat het per definitie slechts één (deel-)aspect van het waterbeheer reguleert en dus geen mogelijkheid biedt om een combinatie van waterbeheerdoelen te realiseren. Wel biedt het instrument de mogelijkheid om ook secundaire, meer algemene beleidsdoelen te realiseren, bijvoorbeeld via het aanwenden van de opbrengsten van het instrument voor innovatie van productieprocessen en het vergroenen van het belastingstelsel.

Decentrale arrangementen hebben de potentie om meerdere aspecten van waterbeheer in één arrangement te regelen. Een goed voorbeeld is het vasthouden van water voor het tegengaan van verdroging, gecombineerd met waterkwaliteitsmaatregelen. Er zijn echter ook doelstellingen die elkaar kunnen tegenwerken. Vasthouden vermindert de mogelijkheden voor piekberging, en piekberging kan negatieve effecten hebben op ecosystemen of landbouwgrond. Vanwege deze tegenstellingen zullen duidelijke ruimtelijke keuzes moeten worden gemaakt. Daarnaast bieden deze arrangementen de mogelijkheid doelen van meerdere beleidsdomeinen te combineren, zoals verduurzaming van de landbouw, natuur- en cultuurbeheer, stimuleren van recreatie en toerisme en realisatie van woningbouwopgaven.

Het arrangement voor bescherming tegen hoog water in rivieren is vanzelfsprekend primair gericht op het thema veiligheid. Vanwege het doorslaggevende belang van dit thema zijn mogelijkheden om middels het arrangement ook andere waterbeheerdoelen te bereiken beperkt. Wel biedt het concept 'ruimte voor de rivier' de mogelijkheid om via meervoudig ruimtegebruik tevens doelen van andere beleidsdomeinen te realiseren. Deze doelen zijn vergelijkbaar met de doelen die met behulp van decentrale arrangementen kunnen worden nagestreefd. Het betreft met name het realiseren van een robuuste ecologische hoofdstructuur, innovatief buitendijks bouwen, het creëren en beheren van waardevol natuur- en cultuurhistorisch landschap, 'ruimtelijke kwaliteit', het uitbreiden van recreatieve en toeristische voorzieningen en het combineren van traditionele vormen van buitendijks landgebruik (landbouw) met blauwe en groene diensten (verbrede landbouw). Door het primaat van veiligheid en de instituties die zijn geïntroduceerd om dit aspect te borgen zijn deze landgebruikscombinaties echter vaak aan veel randvoorwaarden en (dus) beperkingen onderworpen.

Systeemomvattende benadering

De aspecten van integraliteit die hierboven zijn besproken vormen reeds een indicator voor systeemomvattendheid van de arrangementen. Hier wordt dit aspect meer specifiek beoordeeld aan de hand van de niveaus van probleembenadering waarop de arrangementen ingrijpen. Generieke sturingsinstrumenten sturen met name op het 2^{de} en 4^e niveau van probleembenadering (respectievelijk formele instituties en allocatie). Wat betreft het 2^e niveau gaat het met name om een herverdeling van eigendomsrechten van doelgroepen (vanwege het uitgangspunt van 'sterke duurzaamheid') en niet zozeer om verandering van spelregels. Zwakke punten van generieke sturingsinstrumenten zijn dat ze geen echte verandering te weeg (kunnen) brengen op het 1^{ste} en 3^e niveau. Er vindt wel verandering richting milieuvriendelijker gedrag plaats (niveau 4), maar geen (vrijwillige) verinnerlijking. (niveau 1) Wat betreft het 3^e niveau zijn er weinig mogelijkheden om het proces te veranderen. Er kan wel geluisterd worden naar de inbreng van belanghebbenden, maar mogelijkheden om aan deze inbreng invulling te geven in het bestuurlijke arrangement zijn beperkt.

Decentrale arrangementen kunnen in theorie aandacht besteden aan alle vier niveaus van probleembenadering. De arrangementen zijn niet alleen gericht op de uitkomsten van het proces (de allocatieve effecten, niveau 4), maar ook op de invulling van het proces zelf (het 3^e niveau) en het afbakenen van proces en inhoud via formele (2^e niveau) en informele (1^e niveau) instituties. De redenen dat decentrale arrangementen meer dan centrale arrangementen potentie hebben om veranderingen teweeg te brengen op het 1^e niveau zijn de vrijwillige participatie van private partijen en de aandacht voor de socio-economische en culturele aspecten van bestaande en nieuwe arrangementen in het gebied. Aandacht voor het proces (het 3^e niveau) wordt gegarandeerd door het feit dat geen van de actoren doorslaggevende middelen heeft en elk van de actoren een cruciaal (of 'veto-') middel. Op het 2^e niveau lijkt er bij de huidige invulling van deze arrangementen nog weinig verandering in verdeling van eigendomsrechten plaats te vinden. Systematieken van vergoedingen worden gebaseerd op historisch gegroeide eigendomsrechten met betrekking tot gebruik van natuurlijke hulpbronnen en milieu-gebruiksruimte en niet op een utilitaristische lijn (belangenafweging op basis van de huidige problemen en belangen). Met andere woorden, de vraag of de aanbieders van diensten hun (zichzelf toegeëigende) rechten rechtmatig hebben verworven en of deze verdeling van rechten maatschappelijk gezien nog houdbaar is wordt niet of nauwelijks gesteld.

Het discours over de MKBA in de wetenschappelijke arena spitst zich toe op het 2^e (formele instituties) en 4^e niveau van probleembenadering (de effecten van die instituties op allocatie). In de politieke en administratieve arena lijken de formele instituties echter nauwelijks aan discussie onderhevig. Er wordt op dit niveau wel gekeken naar de allocatieve effecten tussen institutionele actoren, maar de effecten op niet-institutionele actoren spelen niet of nauwelijks een rol. Wat betreft het overkoepelende thema 'bescherming tegen hoog water' bestaat in politieke en administratieve kringen wel veel aandacht voor afstemming tussen het 2^e en 3^e niveau van probleembenadering (procesinstituties en hun effecten op het spelconcept), maar minder voor de effecten van deze niveaus op de allocatie (het 4^e niveau). Hoewel in het proces (3^e niveau) veel aandacht bestaat voor participatie en transparantie, is

er minder aandacht voor de vraag of er ook doorwerking plaatsvindt op het 4^e niveau. De rijkswaterbeheerder beoogt daarnaast met het concept 'ruimte voor de rivier' een cultuuromslag (1^e niveau) teweeg te brengen in het denken over bescherming tegen hoog water. Uit bovenstaande kan worden geconcludeerd dat proces en invulling van het instrument MKBA in de huidige vorm niet goed aansluiten op de doelstellingen van het beleidsarrangement 'ruimte voor de rivier'.

Resumé

Uit de analyse en vergelijking van de arrangementen kan worden geconcludeerd dat decentrale arrangementen meer potentie hebben om aan de uitgangspunten van integraal waterbeheer te voldoen dan arrangementen met generieke sturingsinstrumenten. Hieruit mag echter niet worden geconcludeerd dat generieke sturingsinstrumenten overbodig zijn. Ten eerste kunnen niet alle vraagstukken in het waterbeheer met behulp van decentrale arrangementen worden benaderd. Het adagium 'decentraal wat kan, centraal wat moet' lijkt hier op te gaan. Ten tweede bestaat er nog veel koudwatervrees voor dit type arrangement. Ten derde kunnen generieke economische sturingsinstrumenten een belangrijke bijdrage leveren aan meer algemene (milieu-) beleidsdoelstellingen, zoals 'ecologisering' van de economie, vergroening van het belastingstelsel en (financiering van) milieunovaties. Wat betreft de MKBA moet worden gewaarschuwd voor een ongenueanceerde claim van 'integrale evaluatiemethode'. Een meer gebalanceerde afstemming met andere 'integrale' evaluatiemethoden, zoals de milieu-effectrapportage en multicriteria-analyse, lijkt op zijn plaats.

1

CHAPTER 1 INTRODUCTION

1.1 PROBLEM STATEMENT

In the last two decades of the 20th century, a process was set in motion in The Netherlands at the national policy level, in which water policy was increasingly being formulated in terms of a new strategy for water management referred to as 'integrated water management'. This strategy diverged strongly with that in the preceding phase, which can be indicated as sectoral water management. In this sectoral approach, water management served only a limited number of interests, mainly relating to the traditional economic pillars of Dutch society, such as agriculture and transport. In the *Vierde Nota Waterhuishouding* (fourth white paper on water management), a plea is made for a situation in which there is 'more coherence between policy for water, spatial planning and the environment, directed at different interests, such as safety, agriculture, nature, drinking water supply, transport, recreation and fisheries, creating room for area specific tailor made management: a combination of an integrated general approach for national common goals and a specific regional elaboration, taking account of local conditions and possibilities' (Ministerie van V&W, 1998: 9). It is stressed that good water management serves a variety of major economic interests: 'Water as an axis for transport, as resource for agriculture and industry, for drinking water preparation, as a cooling substance for industrial processes, for recreation and as an intrinsic, landscape, nature and cultural-historic value is of great importance for the economy of our country. By investing in a good water management system (both defence and management) the right conditions are created for the development of a high-value industrial society' (idem: 9). At the same time, it is stressed that water management anticipates 'a growing economy, a growing population, the desire to build in water and at the water side, the construction of new infrastructure, diffuse pollution and polluted water floors, continued subsidence and climate change. This anticipation can be shaped by making ecological and hydrological planning principles act as basis for spatial choices, besides other (economic and social) planning principles' (idem: 9). Besides societal changes, changes in natural systems will occur, either or not induced by mankind, that, from a water management point of view demand for a reaction. 'For the long-term, national spatial policy will have to take account of the effects of sea level rise, subsidence, more precipitation and increased run-off through rivers. A long-term strategy is needed to effectively deal with these developments. In this strategy, two lines of thought are central. Firstly, the line that takes as a starting point an as natural approach of water and water systems as possible. Secondly, the line that stresses the water systems approach and the river basin approach in water policymaking (both nationally and internationally).'

From the above it shows that according to the new view on water management, all kinds of both socio-economic and physical developments have to be anticipated by water management. Moreover, it shows that great interests are involved in dealing with these

developments. Often, (some of) these interests will be contradictory and conflicting. It is not to be expected that the issues arising from these developments will be solved mutually by the stakeholders, without the interference of a third (more or less independent) party. An active role of public authorities in dealing with issues in water management therefore seems justified. In steering the developments related to water management, public authorities continuously have to make choices. The means these authorities can use are limited and often the demands of actors involved cannot completely or even only to a limited extent be fulfilled. By adopting the concept of integrated water management, public authorities aim to make decisions in a well balanced manner, by considering all interests and all effects of human activities on water systems (either by government authorities or others). By taking the possibilities (carrying capacity) of natural systems as a starting point for water related activities and by stressing the importance for society of well functioning water systems, it is prevented that nature is left outside the decision-making process.

For influencing societal processes affecting water systems, government authorities can in principle choose from (a combination of) three approaches: command and control (*wetgeving en handhaving*), suasive instruments (information, advice, suasion, etc.) and economic instruments. In the previous phase of sector-oriented Dutch water management, the emphasis was on command and control instruments. This approach was in line with the long-dominant thought in circles of governance of the manageability of society (*maakbaarheid van de samenleving*): public authorities decide what is and what is not allowed, and by means of control (*handhaving*) it is made certain that these rules are abided by. In the last quarter of the previous century, increasing criticism emerged with regard to this approach. Control on compliance of laws and regulations proved difficult to effectuate (*handhavingstekort*) and the extent of control public authorities were striving for was increasingly considered impossible to attain. Besides, it was judged that the command and control approach to government intervention was an inefficient way of managing society. Therefore, various actors started looking for alternative ways of managing society. Obvious alternatives in this respect were to either (to some extent) hand over the initiative to private parties (suasive instruments) or to the market mechanism (economic instruments). This thesis will focus on the alternative of introducing more market mechanism in water management combined with public intervention in these markets via economic (or market based) steering instruments. Besides, it will analyse the debate about the use of economic methods for evaluation of public projects and policy programmes for increasing the efficiency of policy.

The debate about the efficiency and effectiveness of command and control instruments and the feasibility of economic steering instruments and evaluation methods has been going on since the 1980s and remains undecided as yet, if ever it will. There may be many reasons for this. For example, the choice of instruments can be expected to have a great impact on various groups of actors, both public and private. Therefore, it may be expected that objections are raised against any shift in types of instrument to address certain issues. Besides, it is not possible to say on forehand that specific types of instruments or methods are by definition better than others. From the point of view of specific theories, certain instruments may have a theoretical advantage over others. However, in practice, the conditions for the proper functioning of these instruments may not be present, or the instrument may have a different effect than expected on theoretical grounds. Various

factors, both physical, economic and social may influence the suitability of instruments for specific situations. Moreover, it may well be possible that the judgement is that a policy issue can best be addressed by combining various types of instruments. One may even say that certain instruments cannot function without a supporting structure laid down via or for other types of instruments. The factors determining the suitability of instruments and methods for addressing specific situations in water management and the way in which various actors present their advantages and disadvantages in various arenas play an important role in this study.

As was presented before, the role of government authorities in steering processes in water management can be typified as a choice-process. This thought is strengthened by the integrated approach to water management, since in this approach, more than in the former, sectoral approach, the aim is to make well informed choices in which all interest are balanced. Keeping this in mind, it may be argued that government intervention according to economic principles is in principle a very suitable approach to issues in water management, since the focus of economics as a science is per definition directed at (balanced) choice-processes (see Dietz, 2000). Government interventions based on economic principles aim to modify the ranking of alternative actions by economic actors on economic grounds, while leaving the final choice to this actor. According to neo-classical economic theory, in this approach, government authorities do not have to rely so heavily on their capabilities to enforce environmental standards and regulations. As such, economic policy instruments do not operate according to the notion of the manageability of society as much as do command and control instruments. According to neo-classical economic theory, economic policy instruments have a number of other theoretical advantages over command and control instruments. One of the major theoretical advantages is efficiency. Neo-classical economics assumes that under certain conditions, perfect competition exists in markets, and, as a consequence, allocation of commodities takes place in an efficient manner. Economic steering instruments would only have to slightly steer this allocative mechanism in order to obtain a publicly desirable outcome of this process. Since economic steering instruments aim to influence an already present and efficient allocative mechanism, according to advocates of neo-classical economics, the costs for the administration, monitoring and enforcement of economic policy instruments are not as high for economic instruments as for command and control instruments. Opponents⁶ of economic policy instruments (also referred to in this thesis as economic steering instruments or market based instruments) argue that the presumed advantages of these instruments based on theoretical insights, cannot be achieved in reality. Besides, they point at a number of disadvantages of economic instruments compared to other types of steering instruments or public projects. These disadvantages will be widely discussed in this thesis.

The debate about methods for evaluation of public activities (public policy or public projects) is somewhat different in nature than that for economic steering instruments as discussed above. This debate centres around the issue of the measuring and comparison of costs and benefits related to public policy. One of the major theoretical advantages of economic evaluation methods compared to other types of evaluation methods is that in economic

⁶ Within the scientific arena, such opponents may be found both within different schools of economic thought and within other than economic scientific disciplines.

evaluations, all effects are expressed in the same (monetary) unit, which makes these effects comparable. However, this process is not without difficulties. The degree to which this is possible is subject to heavy debate. Opponents of expressing the inputs and effects of public policy or public projects in monetary terms only argue that it's impossible to properly express all effects in monetary terms, both from a fundamental and practical (methodological) point of view. Both the debate about economic steering instruments and evaluation methods will be analysed in this thesis.

Since the 1980s and early 1990s, economic policy approaches (both economic policy instruments and evaluation methods) are widely stimulated in international water policy. A major impulse for economic approaches to water management was the Dublin conference on Water and the Environment in 1992. Principle 4 of the Dublin statement states that 'water has an economic value in all its competing uses and should be recognised as an economic good'. The additional comment to this principle states that 'within this principle, it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognise the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources'.

Van Ast (2000: 120) argues that an integrated approach to water management, according to the water systems approach and the eco-systems approach entails a shift from supply management of water towards demand management. An important characteristic of demand management is that it places a limit on water use (i.e. on demand). Demand management is defined by the World Bank as 'the use of price, quantitative restrictions, and other devices to limit the demand for water' (World Bank, 1993: 5). A number of economic principles for environmental management that date back to the 1970s were explicitly adopted in various declarations and policy papers for water management at the turn of the millennium. For example, the polluter pays principle was recommended by the OECD Council of the Guiding Principles Concerning International Economic Aspects of Environmental Policies in 1972 and endorsed in the early 1970s by amongst others the European Community. It was also one of the 27 principles formulated in the Rio Declaration at the UNCED conference 1992 (the so called Earth Summit). The principle was recognised as an important principle in the Second World Water Forum's Ministerial Declaration. This declaration emphasised the importance of increasing the effectiveness of pollution control strategies based on the polluter pays principle by developing appropriate liability and compensation rules and procedures. The description and analysis in this thesis of the economic elements of the European water framework directive (WFD) issued by the European Union in 2000 will show that economic mechanisms and policy principles play an important role in European water policy as well.

The statements made at influential international conferences and the positions taken by influential international institutes have lead to a heavy debate about the role of the market mechanism, economic policy principles and economic policy approaches (instruments and methods) in water management in the 1990s and early 2000s, including in The Netherlands. This debate centres around the way the economic notions and policy principles formulated at the international policy level, such as in the WFD, should be interpreted and made operational for the nation state, regional and local levels. Examples of such economic

principles mentioned in the WFD are the 'principle of full cost recovery, including environmental and resource costs', the 'polluter pays principle', and the 'principle of cost effectiveness and cost efficiency' and the 'principle of derogation of disproportionate costs'. Besides economic principles, a number of other (types of) principles have been formulated, which can be categorised as ecological principles, environmental principles and social and institutional principles. Various views exist about the purposes and effects of the economic principles with respect to the fulfilment of other types of principles. For example, whereas policymakers may emphasise the presumed increase in the efficiency of water use by applying economic mechanisms in water management, private economic actors may regard the principle of treating water as an economic good as an opportunity to commercially exploit drinking water. Socially engaged actions groups, on the other hand, emphasise the availability of sufficient water for people as a basic right and fear that, as a consequence of treating water as an economic good, the price of drinking water will rise and that as a consequence, poor people will not have access to sufficient drinking water for fulfilling their basic needs. However, this argument is not likely to play a large role in The Netherlands because of the high average purchasing power and the low price of water relative to other utilities. Finally, environmentally engaged actors are likely to emphasise not (only) the availability of sufficient water for human use, but especially the importance of the availability of sufficient water for maintaining full grown aquatic ecosystems.

Besides the international level, water policy at the Dutch national level also shows an increasing attention for allocation of goods and services via the market mechanism, combined with economic policy instruments and evaluation methods. Several reasons may be brought forward for this attention. As already mentioned before, economic approaches hold the promise of more efficient public management compared to command and control instruments. This may be achieved by introducing more 'economic sense' in public management via the introduction of more markets (privatisation, liberalisation) and/or via introducing economic steering instruments and using evaluation methods. Another reason may be that economic approaches in theory leave more room for manoeuvre to the market (i.e. to economic activities by the private sector). If true, such an approach would be in line with the general trend in governance of deregulation. Of course, economic policy approaches in public water management in The Netherlands are not completely new. In fact, water boards in The Netherlands have been self supporting in terms of generating financial resources since their erection in the Middle Ages. Besides, the Dutch surface water pollution act of 1970 was the first act in Europe to introduce the polluter pays principle as financing principle for surface water quality management and has acted as an example for other EU Member States. However, one of the working hypotheses of this thesis is that economic policy instruments and evaluation methods are not yet applied to the extent that could be expected on the basis of (especially neo-classical) economic theory. In order to explain this gap between theoretical and actual application of these economic approaches, it is argued in this thesis, one should not only look at the theoretical advantages and disadvantages of different types of policy instruments, but also at characteristics of the decision-making process about the design and use of policy instruments and evaluation methods and the policy domain in which these instruments are to be implemented.

A considerable number of scholars have already evaluated environmental and water policy and policy instruments in The Netherlands, including economic instruments and methods, in

their PhD-dissertations. Examples of such studies are the works of Bressers (1983), De Bruijn and Lulofs (1996) and Klok (1991). A general characteristic of these studies is that they were quantitative and/or normative in nature. Although interesting and useful, it was not the primary goal of these dissertations to explain why and how policy instruments and evaluation methods were or were not implemented. Looking at the way decisions regarding the design and implementation of economic policy instruments and evaluation methods takes place is another, more explorative way of analysing policy, which is expected to yield a better insight in the influence of various factors on the outcome of policymaking. In this thesis, the attention is therefore directed both at theoretical applicability of economic principles in integrated water management from various perspectives and at factors influencing the decision-making process about the application of economic policy principles in Dutch water management. As shows from the discussion above, the use of economic policy instruments and evaluation methods in water management can be legitimised or objected to from various points of views.

1.2 RESEARCH QUESTIONS

In the light of various societal and political developments, leading to different arguments in favour of and against the use of the market mechanism, economic policy instruments and evaluation methods, combined with the overall goal in Dutch water policy of achieving a state of integrated water management, the following central research question can be posed:

'What role do economic policy instruments and evaluation methods play in integrated water management in The Netherlands?'

In order to be able to address this central question, it is divided into sub-questions. These sub-questions are presented below.

Sub-question a) is:

'What assumptions does economics make and what conditions does economics raise with regard to the functioning of economic policy instruments and evaluation methods?'

Sub-question b) is:

'What are the starting points of integrated water management, how is the concept made operational in Dutch water management and how are economic policy instruments and evaluation methods embedded into this policy domain?'

Sub-question c) is:

'What contribution can economic steering instruments and evaluation methods make in theory to the implementation of the concept of 'integrated water management' and what contribution do they make in the practice of Dutch water management?'

Sub-question d) is:

'How can the role economic steering instruments and evaluation methods play in Dutch water management can be explained?'

The next section will discuss the way in which the main research question of this thesis will be addressed, through answering the sub-questions formulated above.

1.3 STRUCTURE OF THE THESIS AND OUTLINE OF THE CONTENT

1.3.1 THEORY AND ANALYTICAL FRAMEWORK

As was discussed in the previous section, the object of study is 'the application of economic policy instruments and evaluation methods in Dutch water management'. In this thesis, economic policy instruments are interpreted as mechanisms through which public authorities can influence the behaviour of economic actors by giving incentives based on theoretical notions about the functioning of markets. Economic evaluation methods are interpreted as methods through which effects of policy can be expressed in monetary terms, with the purpose of evaluating this policy in terms of economic performance. Economic performance, in turn, can be interpreted as the consequences of activities (in this case public policy) on the economy as a whole, expressed in monetary terms. With regard to these instruments and methods, the goal of this thesis is to both assess and explain their role in Dutch water management. This role can be expressed in various ways. An obvious indicator for their role is the degree to which these instruments and methods contribute to achieving policy goals. However, the official goals as formulated in policy may not be the only purpose for which these instruments and methods are designed and implemented. Other actors than public authorities may have their own, different goals, and pursuing official policy goals may not be the only reason for public authorities to suggest and implement these instruments and methods either. The role these instruments and methods play may be assessed by identifying a range of characteristics of these instruments and methods and the situation in which they are implemented, such as the scope of the issues to which these instruments and methods are applied, what these instruments look like in detail (their design), the way they are eventually implemented and the effects they cause. In this thesis, these characteristics are considered to be the result of the interaction of all actors involved in processes of policymaking and implementation in Dutch water management involving these instruments and methods.

In order to be able to structurally analyse these processes of policymaking, an analytical model will be developed. This thesis contains both exploratory and explanatory elements. The analytical model is developed for both purposes, but is especially useful for the explanatory part. The model will help explain how policymaking processes influence the role the economic instruments and methods studied play in Dutch water management. The model will be described in general terms in chapter 2. The purpose of this description is to explain the origin of the model and the purposes it was designed for. However, when described in general terms, it may be used for analysing any type of policy instruments or evaluation method in any policy domain. Therefore, the model will be adapted in chapter 3 to make it more suitable for the analysis of the object of study of this thesis. This will be done by incorporating specific characteristics of economic instruments and methods, decision-making processes about their application and insights in the interpretation and 'operationalisation' of the concept of integrated water management in the model.

In this thesis, the core of the analysis of decision-making processes is formed by the analytical concept of policy arrangements. Van Tatenhove et al. (2000: 7) define policy arrangements as 'the substantive and organisational stabilisation of a policy domain, consisting of four dimensions: 'coalitions', 'rules', 'power and resources' and 'discourses''. Policy arrangements can be regarded as the setting in which processes of policymaking take place, where the specific constellation of actors, institutions ('rules'), power and resources and discourses and their relationships influence the outcomes of these processes in terms of the formulated policy. Parallel to this, the application of economic instruments and methods to address issues in Dutch water management as studied in this thesis is expected to be determined by the dimensions of the particular arrangement addressing a particular issue. Besides the particular dimensions of the arrangement, other, more general (exogenous) factors may also influence the outcome in terms of the instruments and methods applied, by influencing the dimensions of the arrangement and their relationships. The influence of these exogenous factors will be addressed later. The substantive stabilisation of policy domains or issues refers to a stabilisation of the discourse about a policy domain or policy issue. Discourse can be regarded as a scientific term for debate. Just as the other dimensions of the analytical framework, it will be more clearly defined in chapter 2. The organisational stabilisation of a policy domain or, as used in this thesis, of the way a specific issue is addressed through policy, refers to a stabilisation of the actors involved in this policy, the resources they can use, the power they have and the role they (are allowed to) play. The debate (discourse) about the issue may centre around the choice and design of a policy instrument or evaluation method, but this does not necessarily have to be the case. Before addressing the choice of policy instruments or evaluation methods, other choices may already have been made in the overall discourse about the policy issue that may influence (predetermine) this choice of instrument or method. For example, new scientific information may be published that makes the necessity of formulating policy for a certain issue redundant (say that it is proven that global warming and sea level rise does not exist), or the dominant discourse about an issue is that public authorities cannot influence that issue by formulating and implementing policy at all.

After describing the dimensions of the analytical model and their relationships from a general perspective in chapter 2, the analytical model will be further made operational in chapter 3 for the purpose of this thesis, that is the description, analysis and explanation of the content and role of economic policy instruments and evaluation methods in Dutch water management as a result of policymaking processes. In order to be able to do this in a coherent and meaningful way, it is important to explore theoretical notions about the functioning of economic policy instruments and evaluation methods and the concept of integrated water management. The former involves the analysis of assumptions about and conditions for their proper functioning, issues regarding their design, the influence of design on the (expected) types and magnitude of the effects caused by these instruments and methods and the mechanisms through which they (aim to) influence behaviour. The latter involves the analysis of various opinions about the meaning of the concept, the preconditions for attaining an integrated approach and the way these preconditions can be translated into various elements of policy, ranging from abstract (such as policy principles) to concrete elements (such as instruments). Chapter 3 will start with exploring various notions about 'economic policy instruments and methods' and 'integrated water management'. For both,

this exercise will result in an overview of (various interpretations about) their key characteristics. In the next step, these key characteristics of economic policy instruments and evaluation methods on the one hand and integrated water management on the other will be confronted with each other to gain insight into the way various scientific disciplines and schools of thought (may) think about the theoretical scope and purpose of applying economic policy instruments and evaluation methods in water management and the conditions according to which they could contribute to shaping integrated water management.

As can be interpreted from the passage above, various scientific disciplines and schools within these disciplines represent different assumptions about the functioning of economic steering instruments and evaluation methods. The same can be said about integrated water management. Actors with different belief systems will also have different opinions about the meaning of the concept of integrated water management and the way it should be made operational. As a consequence of these different assumptions and opinions about economic instruments and methods and about integrated water management, there will also be different opinions about the potential contribution of these instruments and methods to integrated water management. This mechanism is explored a little further here. With regard to actors' beliefs regarding the applicability of economic policy instruments and evaluation methods, a distinction can be made between scientific disciplines or schools of thought within the same discipline that put humans and their needs and desires at the centre of attention (the anthropocentric view) and those that regard humans and human society as part of a larger system, including other organisms and inorganic elements (the ecocentric view). Those disciplines and schools of thought that put humans at the centre of attention are likely to focus on (calculating) the impact of public activities (public projects or steering instruments) on humans, while those that regard humans as part of a larger system are likely to focus on assessing the impact of public activities on this larger system. Of course, in both categories, there will be gliding scales with regard to the balance in focus between humans and ecosystems⁷. Therefore, different actors that fall in either category will also hold different views with regard to the degree to which the effects of human activities on ecosystems can be calculated and expressed in monetary terms and with regard to the degree to which economic steering instruments can contribute to achieving healthy aquatic ecosystems. To put it even stronger, even those actors that agree on this may draw different conclusions with regard to the use of economic policy approaches. Some may draw the conclusion that economic approaches are by definition anthropocentric, can therefore never value and balance all effects on ecosystems or the total value of these ecosystems for human society, and should therefore be rejected altogether. Others may think the same about the degree to which effects and values can be expressed in monetary terms, but may argue that despite this, these economic approaches may still contribute to improving the quality of ecosystems. The views above may be expected within the category of actors that basically hold an ecocentric point of view. A similar gliding scale can be said to exist in the category of actors that basically hold an anthropocentric view. Some may think that ecosystems are of little value to humans, and that therefore the effects on and values of ecosystems need not be included in economic calculations. Those that believe in the unlimited calculative capacity of human beings may acknowledge the importance of ecosystems, but

⁷ Hence the specification regarding schools of thought within one scientific discipline.

may hold the opinion that all effects of human activities and all values of goods and services, including those provided by aquatic ecosystems, can be expressed in monetary terms. Altogether, as a consequence of different belief systems, various groups of actors are thus likely to hold different opinions about the potential contribution of economic policy approaches to achieving integrated water management. As was mentioned above, apart from the opinion about the scope and functioning of economic policy approaches, this judgment also depends on the interpretation of the concept of integrated water management.

Not surprisingly, the a gliding scale between an anthropocentric and ecocentric point of view also exists within the scientific discipline of economics, where these various points of view are represented by different economic schools of thought. These different views with regard to the relationship between man and nature may be either the cause or the consequence of different assumptions about the behaviour of economic actors and the functioning of the market. For example, classical economics takes as the basic assumption for economic analysis that economic actors act as rational, calculative agents. This means that these actors do not let irrational motives influence their choices and that these actors can quickly process all the information they need in order to come to a decision based on logical calculations. Most other schools of economics that have emerged in the previous century, such as neo-classical, institutional, environmental and ecological economics, have criticised this assumption and have (thus) emerged as a reaction to this school of thought. These schools argue that economic actors do not always act rationally in the way as interpreted by classical economics, and that these actors have limited capacity to process all the information needed to come to a 'logical' decision. The limited capacity to process all information needed and the inclination not always to make rational choices is generally referred to in economics as bounded rationality. Institutional economics even goes further than neo-classical economics in the pervasiveness of bounded rationality by stating that economic actors, besides having a limited capacity to process all information available, may not even have all the information necessary to make rational decisions at their disposal. Besides, according to this school, obtaining this information is often costly, which results in transactions not taking place, whereas they would if information was abundantly and freely available. The different assumptions about the behaviour of economic actors and the functioning of markets as discussed shortly above will in turn result in different assumptions about and starting points and preconditions for the application of the market mechanism for the allocation of goods and services and the use of economic steering instruments in these markets to make these markets function in such a way as to serve public goals as well. Moreover, actors holding different belief systems will have different interpretations about 'sound' decision-making and will thus use different criteria for assessing whether or not decisions are sound. This in turn leads to different assumptions about the way in and degree to which economic evaluation methods can contribute to making 'sound' decisions in public policy.

The discussion above shows how different belief systems may result in different opinions about the applicability and usefulness of economic policy approaches, including in water management. In the debate about the way policy issues in water management should be addressed, these different beliefs are confronted with each other. It is assumed in this thesis that out of this debate, in which actors have various strategies to convince other actors of

the rightness of their view, comes a dominant view, which acts as a guidance for formulating and implementing policy. The elements of policy in which this view is translated than act as a form of formal confirmation of this dominant view. In other words, this view is institutionalised through policymaking. Apart from the fact that a dominant view results in new institutions via policymaking, at the start of the debate (discourse), other institutions are already in place that may influence the outcome of this policymaking process. For these existing institutions may determine which actors are allowed to participate in the policymaking process and what role these actors are allowed to play. For example, they may have appointed on forehand certain rights to specific actors that cannot be (easily) changed by the new policy and that give these actors a special position (a power advantage) in the debate (discourse). As such, besides actors and discourse, these existing institutions are another element of policy arrangements that may influence the application of economic policy instruments and evaluation methods.

All the elements discussed above are constituting parts of arrangements addressing a specific policy issue. They consist of actors involved in this policymaking process or of elements that can be influenced by these actors. As was announced before, besides these elements that are part of the arrangement itself, there may be factors influencing the choice of policy instruments and evaluation methods that are essentially not part of these arrangements, but that nevertheless may influence the outcome of the policymaking process. These elements are referred to in this thesis as exogenous factors. Examples of such exogenous factors are natural phenomena⁸, such as floods or droughts, or societal phenomena, such as changing preferences with regard to the use of urban and rural areas, or a shift in public power from the nation state to the level of the European Union or to the local level. Although not exclusively part of a specific policy arrangement, these exogenous factors may have great influence on the way this arrangement is given shape, by influencing various elements of the arrangement and relationships between the elements. For example, the actors involved in the arrangement regarding a specific issue in water management, such as for example the problem of desiccating forests, may hold different opinions about the consequences of an exogenous factor, say recent periods of droughts or increasing frequency of droughts, for the way the issue at hand should be addressed through policy. These different perceptions about the relevance and consequences of these exogenous factors may influence the discourse about the issue, the need for addressing it through policy and the way it should be addressed. For example, shifts in recreational needs and desires may lead to different perceptions about what functions water systems should fulfil, and thus to different demands regarding the appearance of these water systems, what the water quality should be and how much and in what way water should be available for the desired purposes. This in turn is likely to lead to different perceptions about the way the 'soundness' of decisions in policy should be assessed. It will be argued in chapters 2 and 3 that these exogenous factors influence the outcome of policymaking mainly via discourse, that is they influence the way various actors interpret the factor and present their interpretation and the consequences of that interpretation in terms of policy to other actors.

⁸ Referring to these phenomena as natural phenomena does not automatically imply they are not the result of human activities.

When expressed in economic terms, the shifting needs and desires in society with regard to the functions water systems should fulfil for society leads to shifts in demand for specific goods and services provided by these systems. When demand for specific goods or services is high, and supply is low, not all demands for that good or service can be met, and the particular good or service is said to be relatively scarce⁹ in an economic sense. This notion is a basic condition for an economic approach to any social issue and is used by some actors as an argument for an economic approach to water management. The introduction of the market mechanism in water management may be regarded as a way to make demand and supply meet, either through limiting demand or through enhancing supply by private actors of the goods and services needed. Trading goods and services via markets is based on the assumption that the relative scarcity of these goods and services is (properly) represented by a market price. The assumption of standard economics is that under specific circumstances (perfect competition), the price for a good or service, resulting from the confrontation of demand and supply, is a proper indication of the value of the good or service. According to standard economics, under these circumstances, the good or service will be used by the actor that is willing to pay the highest price, and as such market allocation leads to the use of a good or service for purposes with the highest value. However, the value of some goods and services can be more easily expressed in a market price than others. Besides, people may attribute great value to a good or service without having the desire to acquire its property rights. Therefore, many argue that market prices often do not properly represent the value of a good or service, especially when this good or service is complicated in nature. The other way around, some goods and services are traded in the market at prices that only reflect the positive value of that good or service, and not the 'unpriced' negative values, such as the negative effects of their use on the environment. Examples of such goods and services are substances polluting water and activities damaging aquatic ecosystems. Actors adhering this view include specific schools of economic thought, such as environmental and ecological economics.

Goods and services the value of which can be easily expressed in a market price are usually relatively simple goods for which the property rights¹⁰ are well defined. In this situation, it is clear in what way the buyer may use the good or service paid for. For other goods and services, property rights may not be as well defined. This counts for complicated goods or services that can be used in various ways and that can be less easily traded (via the transfer of property rights) in a controlled way. This situation often applies to goods and services provided by nature, including free water. For example, the use of free water for various purposes cannot be controlled as easily as the use of bottled water. Besides the rather technical debate about the feasibility of turning free water into a private good, there is also a more political debate about the question whether or not turning free water into a private property would contribute to wasteful use of this water. Some argue that this would end this wasteful and hedonistic use of water, while others argue that turning it into a private good would preclude the use of this water that should be 'available to anyone to dispose of and enjoy'. Consequently, these actors may argue that public authorities should regulate the use of these freely available goods or services, referred to in economics as public goods. In this

⁹ The concept of relative scarcity will be addressed in chapter 3.

¹⁰ The concept of property rights will also be addressed in more detail in chapter 3. For now, they can be interpreted as the rights of (economic) actors to use or dispose of a good or service.

case, economic steering instruments may be used to support desirable economic activities (for example, private actors somehow providing clean water) or to slow down or stop undesirable developments (such as the pollution of water systems) by giving positive or negative economic incentives, while economic evaluation methods may be used to make the (change in) value of various goods and services provided by these water systems more explicit. A precondition for the application of economic steering instruments is that the good, service or activity to be regulated is traded in a market and thus is attributed a market value. Therefore, the possibilities for applying economic steering instruments depend on the availability of markets¹¹. A precondition for the use of economic evaluation methods is that the goods and services to be valued can be expressed in monetary terms. Keeping in mind the discussion about varying and conflicting belief systems and interests in water management, not surprisingly, opinions differ widely with regard to the degree to which markets can be introduced, the degree to which these markets can and should be regulated via economic steering instruments and the degree to which values of goods and services, especially public ones, can and should be expressed in monetary terms. Consequently, opinions also differ widely with regard to the degree to which the introduction of market mechanisms, economic steering instruments and evaluation methods for the regulation of water and water systems is desirable, feasible and useful.

The part above shortly discussed the potential consequences of changing societal preferences regarding the functioning of water systems on the debate about the application of economic steering instruments and evaluation methods. This influence on policy arrangements will be mainly felt through discourse. Another way in which exogenous factors may influence the shape of a policy arrangement in Dutch water management is that these exogenous factors may lead or have lead to general institutions that are not specifically targeted at the issue at hand, but that nevertheless influence the arrangement addressing the issue at hand. An example of such an institution is the formulation of rules at the EU level about the forms of state support for activities in Member States that are allowed and those that are not. As we will see in this thesis, the formulation of such rules also influences arrangements in Dutch water management.

In this thesis, the assumption is thus that factors influencing the design and application of policy instruments and evaluation methods may consist of dimensions of the policy arrangement addressing the issue at hand, or of exogenous factors that influence these dimensions. In the passage above it was shortly discussed in a broad sense what the specific nature of these factors may be when addressing *economic* policy instruments and methods. The analytical framework as will be developed in chapter three serves to enable the description and analysis of policymaking processes in Dutch water management regarding the use of economic policy instruments and evaluation methods, in the light of the dynamics of this process as described shortly above. For this purpose, it will be further tuned to the particular characteristics of policy arrangements for water management involving these instruments, keeping in mind the overall goal of integrated water management. In other words, making the framework operational for empirical analysis means identifying, defining and describing the characteristics of the dimensions of the analytical framework and their

¹¹ It must be noted here that such a market may be created artificially by public authorities, such as in the case of emission trading.

relationships that are specific for the application of economic steering instruments and evaluation methods in Dutch water management. Examples of specific characteristics of arrangements for water management involving economic instruments and methods are the degree to which actors agree about the valuation of water and aquatic ecosystems in monetary terms, the need for and feasibility and usefulness of steering certain markets, the degree to which political and economic institutions, such as pollution standards and property rights, predetermine the outcome of the policymaking process and the degree to which exogenous factors, such as the trend towards economisation, influence policy goals and policy evaluation.

On the basis of this analytical framework a strategy for empirical research will be developed at the end of chapter 3. The development of this strategy starts with the formulation of specific research questions. These questions are based on the main research question of chapter 1 and its sub-questions, but will be specified for the object of research on the basis of the analytical framework and theoretical insights about the way economic instruments and methods can contribute to expressing the value of water and aquatic ecosystems in monetary terms and influence the allocation of markets in such a way that these values are incorporated in the decision-making process of economic actors. The formulation of these scientific research questions and the way they guide empirical analysis will be addressed below.

Scientific research questions

The goal of the empirical chapters is to assess whether or not the application of economic steering instruments and evaluation methods can be found in Dutch water management to the degree as can be expected on the basis of general insights in the functioning of these instruments and to explain why this is or is not the case. This goal can be divided into two sub-ordinary goals:

1. The analysis of the role of economic steering instruments and evaluation methods in Dutch water management, in relation to the overall goal of integrated water management and;
2. The explanation of this role, by identifying the most important factors determining the application and design of these instruments and methods.

Achieving the first goal can be regarded as answering 'how' and 'what'-questions (descriptive analysis). Achieving the second goal can be regarded as answering 'why'-questions (explanatory analysis). These types of analysis require different research methods, emphasis on different parts of the analytical framework and a different 'operationalisation' of this framework. The strategy for answering both questions will be addressed below.

Answering 'how and what'-questions (sub-ordinary goal 1)

Two types of comparisons are relevant for answering the first sub-ordinary goal of empirical analysis:

- a) The comparison of policy resolutions regarding the application and role of economic instruments and methods in Dutch water management with their theoretical applicability and;
- b) The comparison of actual use of economic instruments and methods and the role they play with the policy resolutions and theoretical insights.

The reason why these comparisons are considered relevant for answering the 'how and what'-questions requires some explanation. The individual analysis of the theoretical applicability, the policy resolutions or the actual use of economic instruments and methods can provide insights into the purposes for which these instruments may be used, are suggested or are actually used, respectively. However, this does not provide us with information about the *degree* to which these instruments and methods are used and differences in the way they are used. Assessing the degree of use requires a point of reference. For water policy, the point of reference with regard to the degree to which economic instruments and methods are suggested are assumptions about their applicability on the basis of various schools of economic thought. Besides, it is possible to compare policy resolutions at various levels of policy in order to assess while there is consensus in the political arena about their use. The policy resolutions about their application are the point of reference for the actual use of these instruments and methods,. These two comparisons yield different types of information. The first is an indication of what is the dominant discourse in the political arena about the way in which issues in water policy should be addressed and the role economic policy instruments and evaluation methods may play in this. The second comparison is an indication of the obstacles that are met when trying to make the intended instruments and methods operational and implemented them in practice. Whereas the process of formulating policy may be performed by theorists, relatively independent from the arena in which this policy is to be implemented (and thus from the actors affected by these instruments and methods), the actual design and implementation of these instruments and methods is likely to involve different actors, with different beliefs and interests. Besides, at this level, the influence of actors affected by this policy is probably felt more strongly, which may lead to adaptations of the instrument or method proposed as compared to the policy resolution.

In the phase of formulating policy resolutions, motives for suggesting economic instruments and methods may thus be based largely on theoretical assumptions about their effects, while in the phase of designing and implementing these instruments, it is assumed that different types of considerations play a role that are more pragmatic in nature.

The comparison of policy resolutions with theoretical applicability (goal 1a) will be performed in chapter 4 and the comparison of policy resolutions with actual use (goal 1b) will be addressed in chapters 5 and 6, together with the second sub-ordinary goal (goal 2, the explanatory part) of empirical analysis. For both comparisons presented above, the key characteristics of economic analysis and the use of economic policy instruments and evaluation methods on the one hand and of integrated water management on the other as identified in chapter 3 are guiding. What I mean by that is that I will first analyse on which assumptions about the applicability and effects of economic instruments and methods and the key characteristics of integrated water management water policy is in fact based. In other words, the questions are what are the dominant discourses in the political arena with regard to these concepts, with which scientific discipline or school of thought do these discourse match most and what consequences does this have for the design and application of economic instruments and methods. Then I will do the same for the comparison of policymakers and those actors making this policy operational and implementing it, and the actors affected by this policy. The analysis of these discourses will help answering the explanatory questions later on.

For the first comparison, an analysis is made of the instruments and methods proposed at various policy levels, the purpose for which they are to be used (motivation for the instrument or method) and their proposed design. These proposals will then be compared with the scope and applicability of these instruments and methods and the conditions under which they (may) contribute to integrated water management as assumed by various disciplines and schools in the scientific arena. For example, this analysis will make clear if the economic instruments and methods suggested in policy resolutions are based on the assumptions of the neo-classical school of economics, the institutional school or the school of ecological economics. Since these schools have different assumptions about the way economic actors can and should be influenced through policy, and about what aspects of the design of these instruments and methods the focus should be on, these schools have different opinions about the scope and applicability of these instruments and methods in water management. Since institutional economics is likely to focus on institutions that influence the application of economic instruments, this school is likely to reject the application of instruments that only function well under perfect market conditions. Instead, advocates of this school are likely to suggest arrangements that explicitly deal with any uncertainties about the degree to which the actual conditions will match the theoretically desirable ones. In other words, arrangements based on institutional economics are more likely to incorporate various types of uncertainties (such as uncertainties about the availability of information, the behaviour of actors involved, the costs of transactions and the influence of exogenous factors) in the design of the arrangement. Likewise, ecological economics focuses on different aspects of the functioning of markets and market-based instruments, and as a consequence, is likely to have a different opinion about the usefulness of various kinds of economic instruments and methods for contributing to integrated water management. For example, since ecological economists take ecosystems as the unit of analysis, they are likely to reject instruments and methods that do not take into account all effects of economic activities on these ecosystems. This may be the case for instruments that are based on a narrow, anthropocentric worldview and that only value the direct effects of economic activities on the actors most closely involved in these activities, and not indirect effects on other 'actors', including the environment. Summarising, various schools of economics hold different assumptions about human behaviour, their effects on nature and which effects of markets and market-based instruments are important.

For the second comparison, the analysis focuses on the way in which the proposed instruments have been or are being implemented. In other words, it will be assessed how these instruments were designed, for what purpose they are used and what their (perceived) effects are. These characteristics will then be compared with the proposed design and purpose (i.e. with the policy resolutions) and the criteria for use of economic policy instruments and methods and for their contribution to integrated water management as formulated in the scientific arena (i.e. with the theoretical insights). On the basis of these comparisons, conclusions can be drawn about the degree to which economic instruments and methods are being used in situations in which this may be expected on the basis of theoretical assumptions and about the degree to which their design and use match with the theoretically optimal situation. The explanation of similarities and differences between theory, resolutions and actual use will be given by addressing the 'why-question'. The way this is done will be explained below.

Answering the 'why'-question (sub ordinary goal 2)

As announced before, the analytical framework developed in chapter 3 is used for addressing both the 'how and what'-question and the 'why'-questions. With regard to the 'how and what'-question, it is used to guide the identification and characterisation of the use of economic elements in Dutch water policy. However, the analytical framework is especially useful for addressing the 'why'-question. The framework will be used for the characterisation of policymaking processes in water management in terms of factors (variables) that influence the degree in which economic policy instruments and methods are used and the role they play. As was mentioned before, these factors may consist of the single dimensions of the policy arrangement and the relations between these elements, and of exogenous factors that may influence how actors involved in the arrangement think about the way in which the issue at hand should be addressed and as such what the policy arrangement should look like. In order to be able to identify the most important factors, criteria will have to be developed to characterise the factors themselves and the relationships between the factors. These criteria can be used for two types of characterisations and/or rankings:

- The characterisation and ranking of variables within one dimension of the policy arrangement, and;
- The characterisations of the relationship between variables that are part of different dimensions, and as such the characterisation of the relationship between these dimensions.

For the first ranking, it is necessary to first identify the possible range of elements within that dimension. The next step is developing characteristics of the elements within one dimension, which enable to typify these elements. The (facultative) last step is the development of a scale for each characteristic, which enables the ranking of elements and relationships between elements with respect to that characteristic. This step is only taken if applicable to that characteristic and if useful for the characterisation of the policy arrangement. To explain these steps, the example of the dimension 'policy coalition' will be used. 'Policy coalitions' consist of actors and their relationships. The first step is to identify the range of actors involved in the arrangement. In arrangements for water policy, these actors may be various, depending on the issue at hand. There will at least be one public authority involved, but often there will be several involved at the same time. Besides public authorities, for both economic steering instruments and evaluation methods, there will be actors (either or not target groups) affected by the use of the instrument or method. Finally, there may be actors that influence the arrangement in other ways, such as scientists providing policymakers with specific information. The next step is to develop characteristics of these actors and their relationships, in order to be able to typify these actors and their relationships, i.e. the way in which these actors influence each other's thoughts and behaviour. Examples of characteristics of actors are whether they are public or private actors, whether they are companies or individual citizens, whether similar types of actors (such as companies or citizens) are dispersed or well organised, whether the actors affected by the policy are involved personally or represented by other actors, and what resources these actors can dispose of to influence the behaviour or opinion of other actors. Examples of such resources are money raised by organised citizens to unite themselves and lobby with politicians, or story lines in discourse, such as the argument that economic policy instruments are bad for the competitive position of the economy. The last step is to develop a scoring table for each characteristic, so that important actors can be distinguished from less important actors and

the relationships between actors can be characterised in terms of a power balance. For example, citizens may unite themselves to lobby, but if they do not know how to do this, they may not influence the decision-making process. The development of these ranking-criteria is required for being able to identify the variables within actual policy arrangements in Dutch water management that have the potential of influencing the choice and design of economic policy instruments and evaluation methods. Whether they really do depends on the relationships between the dimensions that constitute the policy arrangement. These relationships will be addressed in the second type of characterisation.

The second type of characterisation can be regarded as a characterisation of relationships between dimensions of the arrangement. Ranking of dimensions of an arrangement is not really possible for a number of reasons. Firstly, the dimensions of the policy arrangement are very different in nature, which makes it difficult, if not impossible, to develop criteria on which all dimensions can be scored relative to each other. Secondly, many dimensions are inextricably linked, and often, one dimension cannot exist without the other. For example, resources such as property rights of land or water do not have any meaning in a policy arrangement unless used by actors within that arrangement. However, it is possible to identify (develop) characteristics for the interactions between dimensions of the policy arrangement and as such typify these relationships. This enables the characterisation of the complete policy arrangement and as such the explanation of the outcome of policymaking with regard to the choice and role of economic policy instruments and methods. In the characterisation of relationships, actors and discourses play an important role. Actors are the drivers of relationships, since they have a particular interest in influencing other actors. They may do so by using existing institutions or resources available to them. As long as these institutions and resources are not changed, the power-relationship between the actors in the arrangement, and the outcome of the arrangement will remain the same. For example, as long as certain polluters keep the right to discharge certain amounts of polluting substances and no incentives are introduced to change this level of pollution, the relationship between the public authority responsible for water quality management and the polluter(s) and thus the level of pollution is likely to remain the same. In order to change this situation the 'constellation' of actors, institutions, resources and power needs to be changed. Most of the dynamics of this change lies in discourse. The struggle for discursive hegemony can be seen as the confrontation between those that struggle to consolidate strategic positions and those that struggle to acquire such positions. As such, the dimension of discourse can be regarded as the dimension through which the other dimensions of the arrangement interact. Actors holding different views with regard to an issue interact through discourse while making strategic use of various resources, including arguments and existing institutions, to influence this discourse and its outcome in terms of the consolidation of or change in institutions and power relationships. It must however be noted that actors may not only engage in discourse for the purpose of acquiring strategic positions. In some arrangements, the emphasis may not be on strategic positions, but on co-operation between actors with different interests in an attempt to get the best for all parties. This contrast in approach indicates one of the characteristics of the interactions in an arrangement, namely whether the focus in the arrangement is on compromise, win-win or on hierarchical relationships. Another characteristic is whether the focus in the arrangement is on the process itself or on the result. For example, if the focus is on a predetermined result, the policymaking process may be frustrated by too much focus on this result.

With regard to the discourse about the application of economic instruments or methods in water management, an important characteristic is the degree of consensus about various aspects of these instruments or methods, referred to in this thesis as selection criteria. This degree of consensus may relate to the question whether or not the issue fulfils the conditions for the useful application of economic steering instruments or methods, whether or not these instruments or methods (should) lead to the incorporation of all effects of economic activities in the decision-making about these activities and general criteria for policy instruments such as effectiveness, efficiency, equity, fairness, incentive for change and political concordance. The criteria mentioned are further specifications of the term 'useful' with regard to the application of instruments and methods. Actors involved in policymaking regarding the issue at hand are likely to hold different opinions regarding which criteria are important and how the proposed instruments and methods score with regard to these criteria. These selection criteria (both technical and political) for the application of policy instruments and evaluation methods will be addressed extensively in chapter 3. The remainder of chapter 3 will be directed at the description of the research methods for obtaining the right empirical data for describing and analysing the policy arrangements addressing specific issues in Dutch water management. Besides, it will explain the choices made in the thesis with regard to the focus of empirical analysis and the structuring of empirical data on the basis of knowledge about economic policy instruments and methods and the organisation of Dutch water management. The main method for research is case study analysis. This type of analysis was considered most suitable for this thesis since it enables to describe and analyse a subject within its real-life context and yields rich information about this context. Methods for data gathering are interviews, participatory observation and document analysis.

1.3.2 EMPIRICAL ANALYSIS

GENERAL EMPIRICAL CHAPTER

The empirical analysis will be performed in chapters 4 to 6. In this thesis, two large cases are studied. These cases are 'the role of economic policy instruments and evaluation methods in water systems quantity management' and 'the role of economic policy instruments and evaluation methods in water systems quality management'. These cases will be presented in chapters 5 and 6, respectively. However, the empirical analysis will start in chapter 4, by discussing developments in society and governance and elements of policy that (may) influence the application of economic policy instruments and evaluation methods in Dutch water management in a general sense. Chapter 4 thus addresses elements of the analytical framework that are neither specific for a particular policy arrangement in Dutch water management nor for one of the cases, but that may nevertheless influence the outcome of one or more arrangements discussed in chapters 5 and 6 in terms of the instruments or methods applied. These elements may consist of both exogenous factors and of general elements of policy arrangements, such as institutions at EU or national level affecting all aspects of Dutch water management. The result of chapter 4 is conclusions about the potential influence of these general developments and elements on the specific arrangements as will be analysed in chapters 5 and 6. Another important purpose of chapter 4 is the description of policy resolutions with regard to the application of economic policy

instruments and evaluation methods across a number of levels of governance. This description is meant to answer the question in which degree policy resolutions coincide with the theoretical possibilities for applying economic policy instruments and evaluation methods. This equals answering comparison a) of the 'how and what'-question. Comparison b) of the 'how and what'-question will be addressed in chapters 5 and 6, together with the 'why'-question. The way this will be done is addressed in a general sense below. This description starts with the demarcation of the cases.

CASE-STUDIES

As shows from the titles of the case studies mentioned above, one of the choices made in demarcating the empirical field of analysis was to analyse only policy arrangements addressing issues in water systems management. In water management, a common distinction is that between water systems and the water chain. Water systems can be interpreted as interconnected volumes of water consisting of water in the soil and/or of surface water that are not contained in man-made structures or that can freely interact with the environmental compartments soil and air. The reason for formulating a water system as such is that water systems can be contained by natural structures, such as in impermeable layers of soil, and that bodies of surface water may be contained in man-made structures, such as canals and ditches, but these structures do not prevent interaction between environmental compartment. Water chains can be interpreted as the whole system of man-made structures for the preparation and distribution of drinking water and the collection, transport and treatment of waste water, the water in which is (ideally) fully controlled by humans. The reason for analysing water systems management is that in this aspect of water management arrangements have been or are being constructed involving both traditional economic policy instruments and evaluation methods and new economic instruments and methods. Because of the dynamics of policy for water systems management, the range of arrangements is rather large and diverse. This makes the comparison of arrangements involving various types of economic policy instruments and methods interesting. It was chosen not to address water chain management because of the limited availability of time. Besides, compared to the water chain, so far, there is little scientific analysis of the economic aspects of water systems management. Nevertheless, the attention for the economic aspects of water systems management is increasing due to a number of developments. Two important developments that lead to increased attention for water systems quality and quantity management, respectively, are the issuing of the European Water Framework directive in 2000 and a number of incidents regarding both draught and flooding in the 1990s and the early 2000s. The former has given a strong impulse to reformulating and reorganising water systems quality policy and management in EU Member States. The latter has lead to reformulating the basic strategy towards water systems quantity management. A number of other developments have lead to an increased attention for economic aspects of policy in the last two decades. The main development in this respect is the trend in governance towards deregulation, privatisation and liberalisation of (semi-) public activities. This trend was set in motion out of a general sense of inefficiency and ineffectiveness of public governance. This trend is also reflected in the formulation of considerable number of economic policy principles in water policy at the EU level (such as in the Water Framework Directive) and the national level. As a consequence of this trend, all kinds of options are explored to increase the efficiency and effectiveness of public governance, via the

introduction of the market mechanism, economic policy instruments and economic evaluation methods. The trend towards deregulation, privatisation and liberalisation can be regarded as a specific manifestation of the general trend towards rationalisation and economisation of society as a whole and the public domain in particular. The combination of changes in policy for water systems quality and quantity management and trends in governance towards 'rationalisation' and 'economisation' creates the dynamics for studying the possibilities of economic approaches in water systems management.

Another reason for choosing to address only water systems is that 'free water' in water systems, contrary to most water in the water chain, clearly shows the characteristics of most natural resources. This refers to the fact that, generally speaking, its property rights are not clearly defined, which makes it (to varying degrees) a public good. In a general sense, this characteristic complicates an economic approach to its management. For example, in this situation, it is not completely clear who is allowed to use what quantity of water and who is responsible for the deterioration of the quality of water and aquatic ecosystems. The formulation of economic policy principles and goals on the one hand and the limited possibilities and strict conditions for economic approaches to water systems management as a result of the specific characteristics of this 'free water' on the other thus makes the analysis of the role of economic policy instruments and evaluation methods in (Dutch) water systems management an interesting and challenging object of analysis. The reason for this is that opinions differ widely about the possibilities for managing this free water via the market mechanism and economic policy instruments and evaluation methods. It must be noted here that it is not always the use of 'free water' itself that is to be regulated by (economic) policy approaches. In case of water quality management, for example, it is often the use of substances polluting water systems that requires regulation by public action in order to prevent pollution and achieve water quality standards formulated in policy. And in the new spatial approach to water quantity management, the scarce good required for water management is usually land, not water. For these goods and services that are the object of an economic approach to water systems management, property rights will be different and may be better defined. Therefore, management of these goods and services through economic instruments or methods may show better prospects than for free water itself.

The reason for not choosing the level of single policy arrangements in water systems management as cases but instead 'water systems quantity management' on the one hand and 'water systems quality management' on the other is that this distinction is also manifest in specific dimensions of the policy arrangements addressing issues in water systems management. For example, Dutch laws in water management, which are an important part of the dimension 'institutions' of policy arrangements, are for a large part specific for water systems quantity management on the one hand and water systems quality management on the other. Grouping arrangements according to the distinction between water systems quantity and quality management allows for the analysis of differences between these aspects of water management in the dimensions of the policy arrangements and the consequences of these differences for the application of economic policy instruments and evaluation methods.

One specific characteristic difference is the scale of certain phenomena in water management. Although causes of deterioration of the quality of water or aquatic ecosystems

may be local in nature and may vary somewhat between locations, generally speaking, these mechanisms show a large degree of similarity throughout the country. From the perspective of equity it may therefore be argued that these causes should be addressed in a standardised way. In water quantity management, causes and effects of excess water or droughts may occur at any scale, ranging from the global mechanism of global warming, via the management of water discharge in international river basins, to the scale of local precipitation and water level management. Therefore, the scale at which issues in water quantity management are addressed may not be as obvious as for water quality management. The scale at which phenomena occur and the scale at which they are (thus) addressed strongly influence the type of economic policy instrument chosen. Phenomena that are widespread and relatively independent of the local situation, such as pollution from traffic, will usually be addressed by generic instruments that do not (and from the perspective of equity are not allowed to) discriminate between locations. Phenomena that occur at the regional and local level and that vary in magnitude and appearance as a consequence of location-specific characteristics are not likely to be addressed by generic instruments. Generally speaking, for these phenomena, tailor made and more flexible arrangements and instruments are more likely to lead to the desired effect, without causing substantial negative side effects.

Another example of a characteristic difference is the level of governance from which the main institutions addressing the issue at hand originate. As was mentioned above, the introduction of the EU Water Framework Directive was an important impulse for changes in policy for water systems quality management. The impulses for change in policy for water systems quantity management originated mainly from the national level, and sometimes from the level of (international) river basins. Therefore, the influence of EU-regulations may be expected to play a more important role in arrangements for water systems quality management than for water systems quantity management. The general purpose of EU-regulations is to create a level playing field between all Member States. As such, these regulations cause a substantial degree of standardisation of policy. Whether this is also the case for water systems quantity management depends on the degree of detail in which institutions introduced at the national level are specified or, in other words, the degree of political and administrative discretion attributed to lower public authorities. Since the impulses mentioned here are part of a larger total of impulses for change in policy and changes in policy arrangements, they will not be discussed as separate chapters. Instead, as was mentioned before, external factors will be discussed jointly in chapter 4, while impulses being an explicit part of policy arrangements (which can be referred to as endogenous factors) will be discussed in chapters 5 and 6.

Chapter 7 will combine the results of the empirical chapters (4, 5 and 6) in a meta-analysis. The purpose of this meta-analysis is twofold: to analyse similarities and differences between policy arrangements in Dutch water management involving economic policy instruments or evaluation methods and to analyse the degree to which the empirical results are 'generalisable'. In chapter 8, conclusions will be drawn with regard to the research questions and with regard to the applicability (scope and usefulness) of the analytical framework developed in this thesis to policy arrangements in Dutch water management.

2

CHAPTER 2 ANALYTICAL FRAMEWORK

2.1 INTRODUCTION

In this chapter, an analytical framework will be presented that will enable the analysis of processes of policymaking in Dutch water management. The analysis of policymaking processes is deemed necessary to explain the application and design of economic policy instruments and evaluation methods in Dutch water management. Describing only the outcome of these processes and not the process itself can help describe the application of economic instruments and methods, but will not lead to explaining the situations in which they are or are not applied and the design of these instruments and methods. The analytical framework as constructed in this and the next chapter therefore serves the purpose of describing, analysing and explaining the application and design of economic policy instruments and evaluation methods in Dutch water management in a structured manner. The underlying purpose of this is enabling policymakers in water management gain insight in factors influencing the choice and content of (economic) policy instruments and evaluation methods in Dutch water management. This, in turn, should enable policymakers to make better-founded decisions about the use of these policy instruments and evaluation methods, with the purpose of contributing to integrated water management.

At the heart of the analytical framework lies the analytical concept of policy arrangements. The concept of policy arrangements has been used by other scholars to describe policymaking processes in environmental policy, spatial planning and water management. Some of these authors (for example Wiering and Immink, 2003) also explicitly included trends in society in their analysis. However, this was mainly done at a considerable level of abstraction and, as a consequence, it was not elaborated how these trends and their influence on (separate dimensions of) policy arrangements could be identified. Besides, authors using the analytical concept of policy arrangements did not explicitly include the level of individual actors in their analytical framework. The analytical framework as will be developed in this chapter, aims to establish a link between policy arrangements and trends in society on the one hand, and the characteristics of individual actors involved on the other. The trends in society as discussed by Wiering and Immink (2003) are part of a total of factors referred to in this thesis as exogenous factors. Other exogenous factors included in the analytical framework of this thesis are for example developments in nature and trends in governance. At the level of the individual actor involved in policymaking, various characteristics will be analysed. Besides their interests, motives and selection criteria for the choice and design of instruments or methods, this will include an analysis of their belief system, their goals and the strategies they apply to further their goals.

Another argument for developing a new analytical framework (or actually combining and adapting existing ones) is that few studies were found in which the concept of policy arrangements was used to address the application of economic instruments or evaluation methods in integrated water management. The studies that do (f.e. Van Bommel et al., 2003) only address one arrangement or one type of instrument regarding one type of issue in water management. Besides, these studies only address the level of analysis of policy arrangements and not the level of individual actors involved in these arrangements or the influence of exogenous factors on these arrangements. Since this thesis aims to analyse the different roles of various factors (at any relevant level of analysis) in various settings (i.e. various issues, various policy arrangements and various economic instruments and evaluation methods in these arrangements), I consider it necessary to expand the scope of the analytical framework of policy arrangements in Dutch water management. Besides, it is the aim to develop an analytical framework that enables the analysis of any type of arrangement in Dutch water management involving economic policy instruments or evaluation methods. This requires a comprehensive framework. On the other hand, the analysis of *economic* policy instruments and evaluation methods requires the adaptation of a number of elements of the analytical framework to this specific object of analysis. Besides, the analysis of policy arrangements in water management from the perspective of their contribution to *integrated* water management also requires an adaptation of elements of the framework.

Policy arrangements, which, as was indicated above, constitute the core of the analytical framework, are a combination of dimensions that together regulate policy formulation and implementation regarding specific policy issues or policy domains. These dimensions are 'institutions', 'actors and actor coalitions', 'power and resources' and 'discourse', and the interaction between these dimensions. Actors and institutions are central elements in the structure of the policymaking context. In this thesis, actors, also referred to as stakeholders, are those individuals or groups that have a stake in the decision-making process about the application of (economic) steering instruments or evaluation methods in water management. These actors initiate water policy themselves (mostly public authorities), influence it or are influenced by it. Therefore, these actors all have an interest in policymaking. However, having an interest (or 'stake') in the policymaking process does not automatically mean actors participate in this process. Whether or not they do, is determined to a large extent by existing institutions. Institutions can be understood as 'rules of the game'. They are put in place by those actors that have the authority to issue them. These institutions determine which actors are allowed to play a role in the policymaking process and act as agreements between the actors involved about which behaviour is and which behaviour is not allowed in the policymaking process itself. As will be shown in this chapter, institutions can be both formal and informal. Informal institutions are non-written rules, norms of behaviour, ideas and ideologies, made up by and agreed between (some) groups of actors that have a stake in the policymaking process. An example of such an informal institutions may be rules about which actors are allowed to take part in the decision-making process about (economic) policy instruments or methods. Formal institutions are those rules of the game that have been written down and authorised either by a majority of stakeholders in a democratic process or by an authoritative actor. Formal rules provide legitimacy to a specific, fixed distribution of power among stakeholders. Binding elements between the structural elements of 'actors' and

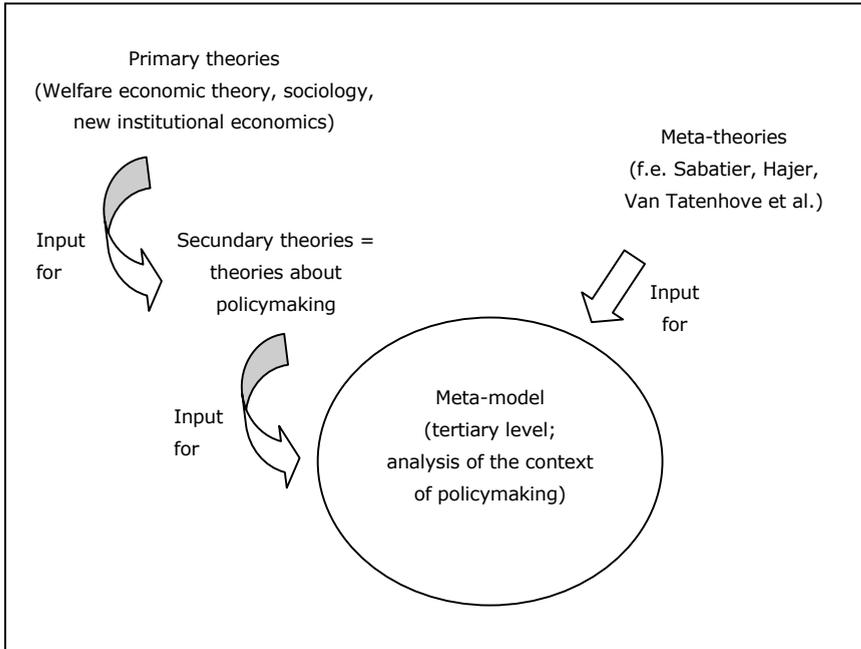
'institutions' are the concepts of 'discourse' and 'power and resources'. Discourse can be understood as the content (or 'substance') of the debate between the actors involved. In this debate, various actors may use various arguments for stressing their position and for trying to convince other actors of the appropriateness of this position. These arguments may be presented in a specific language, using specific words, which may steer the debate towards specific interpretations of the issue and the way to address it through policy. This language used by specific groups of actors is referred to as story lines. Besides using story lines to influence other actors involved in policymaking via discourse, actors can use a range of other resources to establish or reinforce their position in the policymaking process and (thus) influence its outcome. Examples of such resources are financial resources, manpower, the use of media, protests, and existing institutions. The combination of resources used by various (groups of) actors will lead to a certain power balance in the policymaking process regarding a specific issue.

As was indicated before, the analytical framework serves the purpose of identifying factors in the context of decision-making processes that influence the application and design of economic approaches in policymaking for Dutch water management. For this purpose, it is important to get an understanding of policymaking processes and their context first. Theory regarding policymaking processes and the elements of policy will be discussed in section 2.2. These theories about policymaking are referred to as secondary theories. Examples of theories at this level are theories about linear policymaking processes and instrument-theories. Then, in section 2.3, I will substantiate the need for a broad perspective on policymaking for the purpose of this thesis. In section 2.4, an analytical framework will be constructed based on the concept of policy arrangements, which enables the analysis of the context in which policymaking takes place. This focus on the context results from the notion that policymaking is not a straightforward, linear process made in a vacuum by politicians and civil servants. In section 2.5 the scheme for the analysis of policy arrangements will be expanded to include the levels of analysis of individual actors and exogenous factors, and the way they interact with the dimensions of the policy arrangement. Since the model resulting from this is more comprehensive than the secondary theories about policymaking as mentioned above, this scheme is referred to as a meta-level model, or meta-model. For the construction of this meta-model, I will make use of elements of more comprehensive theories for policy analysis, which go beyond the secondary level. Examples of such theories are discourse-analysis by Hajer (1995), theory about belief systems by Sabatier (see for example In 't Veld, 2000) and the theory of the relationship between policy arrangements and political modernisation as developed by Van Tatenhove et al. (2000).

The scheme resulting from this exercise will be made operational (i.e. 'filled in') in chapter 3 for the purpose of this thesis, namely the analysis and explanation of the use of economic policy instruments and evaluation methods in Dutch water management. In the process of making the scheme operational, another level of theory can be distinguished. This level consists of primary (i.e. fundamental) scientific theories about the analysis of societal phenomena and the behaviour of (economic) actors in situations in which choices need to be made. Examples of these theories are welfare economics, new institutional economics and sociology. These theories act as input to the theories at the secondary and tertiary levels of analysis. The relationship between primary, secondary and tertiary (or meta-analytical) levels as discussed above is represented by figure 2.1 below. I will refer to this figure in this

and the next chapter in order to position the sections constituting these chapters relative to each other.

Figure 2.1: Schematic representation of the position of the analytical framework relative to its input theories



The analytical framework of this thesis (the meta-model) thus consists of 3 levels of analysis: the level of interaction between actors and institutions, the level of individual actors and their beliefs, interest, motives and strategies and the level of exogenous factors, which consist of trends and developments in society. These exogenous factors are factors that cannot be influenced (directly) by the actors involved in the arrangement, but that do influence the arrangement themselves.

2.2 CHARACTERISATION OF POLICYMAKING PROCESSES

2.2.1 INTRODUCTION

As was argued in the introduction to this chapter, the scope of application of economic policy instruments and evaluation methods and their effects depend on the decision-making process about the use of these instruments and methods. This decision-making process determines whether or not these instruments are applied, and, if so, how. In order to be able to analyse their application in Dutch water management and compare and explain this reality

with theoretical notions about their applicability, it is therefore necessary to gain more insight in decision-making processes about policy instruments in general, and economic policy instruments and evaluation methods in particular. In the next few sections, these decision-making processes will be addressed from a theoretical point of view. This section starts with definitions of a number of concepts related to policymaking followed by the discussion of a linear representation of the decision-making process. Then, gradually, the interpretation of the policymaking process will be widened towards the end of this section and in the next few sections to include the context in which this process takes place.

2.2.2 DEFINING POLICYMAKING

In the introduction to this section, the formulation of public policy and the choice of policy instruments have been described as a process. The term process includes a notion about the elapse of time. Besides, it includes a notion about a development towards a certain goal. The Merriam-Webster dictionary defines a process as 'a series of actions or operations conducing to an end' (Merriam-Webster, 2002). The process of policy formulation and implementation can therefore be defined as 'a series of actions or operations undertaken by actors involved in policymaking, conducing to an end'. In normative interpretations of policymaking, this end is the achievement of predetermined policy goals.

Several theories exist about what this policymaking process looks like. In some theories, the process is interpreted in a straightforward and often linear way. In this perception, the field of actors involved in policymaking may consist of only one (public) actor. Besides, the series of actions or operations undertaken by this actor is linear and straightforward, and there is only one end or goal to the process. This type of policymaking theory is normative in nature (see for example Russell, 2001). Critics of this perception argue that policymaking takes place in a less structured way. These critics argue that the context in which policymaking takes place has a significant impact on the decisions to be taken in the policymaking process. As a consequence, policymaking processes are perceived to be unpredictable instead of unilinear and straightforward. In these interpretations, the policymaking process is thus taken broader and is assumed to be complex in nature. Besides, a broad range of actors may be involved in policymaking and implementation. The series of actions or operations (to be) undertaken by these actors is non-linear and not always clear on forehand, and the actors involved may have diverging goals in the process. These characteristics contribute to the uncontrollable and unpredictable nature of policymaking. In this thesis, the latter interpretation is adopted. Hence, the linear and straightforward planning process is regarded as too narrow a perspective. In the remainder of this chapter and in chapter 3, a model will be built of policymaking as interpreted in this thesis. For the purpose of reference, the narrow, normative interpretation of policymaking is described in subsections 2.2.3 and 2.2.4. Then, from 2.2.5 onward, the scope of actors, phases and elements involved in policymaking is gradually expanded, in order to describe policymaking from a broader, more complex perspective. In chapter 3, this framework will be made operational for the purpose of this thesis, the study of economic policy instruments and evaluation methods in Dutch water management.

2.2.3 STAGES IN POLICYMAKING

Although narrow in perception, the normative perspective on policymaking is useful to get an idea of the steps that constitute the core of the policymaking process. Russell (2001) discusses the separate steps in policymaking for the environment¹² and the role economics plays in each of these steps. According to Russell (2001: 7), a number of choices can be distinguished in policymaking that give rise to these steps:

- What *goals* to set for the environment;
- What mix of *enforceable requirements*, such as specified limits on levels of pollution discharge, and open-ended incentives, such as a price per unit of such discharge, to impose in seeing to achieve the goals (in other words, what *instruments* to use);
- How much and what sorts of effort to expend in *monitoring* what actually happens, and in penalising bad behaviour or rewarding good behaviour (monitoring & enforcement);
- How to deal with the inevitable *uncertainty*.

The first step as distinguished by Russell involves setting policy goals. Economic considerations can be an explicit side-goal in this step. For example, it can be stated that a certain ambient water quality should be achieved in a cost-effective way within a certain time frame. As such, cost-effectiveness can be an important criterion¹³ for policymaking. The second step involves choosing a policy approach (or 'programme') and choosing policy instruments. This step can be regarded as the design and *ex ante* evaluation of the policy approach and instruments. With regard to the policy approach, the choice may, for example, be between providing certain goods or services via public initiatives (a public project) and a policy programme in which the behaviour of target groups is addressed. The latter case may, for example, involve a choice between economic and command and control policy instruments. In each case, economic effects of public policy initiatives can be estimated in advance (*ex ante*). Although not mentioned by Russell (2001), another step can be distinguished between the choice of instruments and monitoring, namely that of policy implementation. Economic aspects of this step relate to the economic analysis of implementation (such as analysing the total costs and the planning and distribution of the costs of implementation). With regard to the third step as distinguished by Russell (monitoring of policy) two types of economic aspects can be distinguished as well. The first regards the monitoring of the costs of the implemented policy programme. The second regards monitoring the effects of the policy on society in economic terms. Both may yield data for the (*ex post*) evaluation of the policy programme (step 4) in economic terms, depending on the purpose of the evaluation. Besides, the costs of monitoring itself can act as a criterion for the choice of policy approach and instruments or methods. The *ex post* evaluation can serve to choose whether the chosen policy programme should be continued or

¹² As will be argued later in this thesis, integrated water management shows a high degree of resemblance with sustainable water management, and 'taking care of the environment' is an important aspect of sustainability, which will be focused on in this thesis. Therefore, literature about the role of economic instruments and methods in environmental policy can be (and is) taken as a starting point for the analysis of these instruments and methods in water policy.

¹³ For an extensive discussion of criteria for the selection of policy instruments and evaluation methods, I refer to chapter 3.

stopped, should remain the same or should be amended. The choices identified by Russell will be described more extensively below.

SETTING GOALS

In policymaking, two basic categories of goals can be distinguished: ideological goals and pragmatic goals. Ideological goals refer to a desired state of the world, while pragmatic goals can be interpreted as intermediate goals formulated in concrete terms, the achievement of which should contribute to the overarching ideological goal. An example of this distinction is the formulation of environmental goals in terms of ambient environmental quality (representing the former category) as opposed to the formulation of environmental goals in terms of emission reductions (representing the latter). While the choice of environmental goals is inherently a political problem, according to Russell (2001) there is nonetheless a role for economic analysis in providing information about the choices open in any particular problem setting. This role is labelled by Russell as 'cost-benefit analysis' (CBA); in it, the aggregate (total across all the actors in society) effects (both costs and benefits) of alternative choices are compared in monetary terms. According to Russell, with regard to environmental policy, economics as a science can make three types of contributions¹⁴. The first contribution is to clarify the definitions of costs and benefits so that they are sensible and consistent with the entire conceptual foundation that underlies the view of free markets as desirable institutions, consumers and firms as participants in those markets, and environmental goods and services as prime examples of the failure of markets to lead society to 'optimal' situations when *public goods* such as air quality, and *externalities* such as pollution, are involved. The second contribution is and has been the development of practical (albeit complex and controversial) ways of estimating the benefits associated with alternative environmental goals (what are the benefits to society of protecting the environment?). A third contribution of economics distinguished by Russell, is the provision of consistent rules for dealing with time in the context of environmental policy decisions. Most simply, comparing alternatives usually involves comparing different patterns of benefits and costs over some chosen time period. Thus, for one way of dealing with a problem, initial costs may be high and benefits low, while in the future benefits may grow and costs decline. Another policy alternative might have the opposite pattern. Comparing two different patterns of costs and benefits requires deciding how valuable the future is compared with the present (Russell, 2001: 8).

Critics of this role for economics in setting environmental goals will argue that economic methods for evaluation like CBA are always insufficiently able to incorporate all effects of alternative choices. Besides, they will argue that using tools like CBA will put too much emphasis on the selection of policy alternatives based on economic criteria as compared to other criteria. As with regard to dealing with time issues 'the economic way', critics are likely to focus their comments on the use of the discount factor. The height of this factor determines the relative importance of effects in the short as compared to the long-term. In

¹⁴ The strict separation by Russell of policymaking as a subjective activity and viewing the role of economics as a scientific discipline in terms of delivering objective input for making choices in this subjective process can be regarded as a typical example of a modernist approach to (the analysis of) processes of policymaking.

economic terms, there is a rationale for using a discount factor. Opponents, however, are likely to have ethical objections to its use, since in their view, using a (positive) discount factor will always result in favouring alternatives with short term gain, leading to opportunistic, exploitative behaviour and private gain over more 'sustainable' alternatives, which are to lead to societal and environmental optima in the long run. These different points of view about the role of economics in policymaking are fundamental in nature. Fundamental ideas about the (desirable) state of the world, the (desirable) behaviour of groups and individuals in society, the (desirable) role of public and private organisations in this society and the (desirable) role of various sciences in policymaking are referred to in this thesis as paradigms. Paradigms will be discussed more extensively further below and in the next chapter. As will show from that discussion, paradigms play an important role in choosing a strategy with regard to dealing with uncertainty. Another aspect of policymaking that emerges from this short discussion is that of discourse. For the moment, discourse can be interpreted as the linguistic and argumentative confrontation between actors with different views in the form of debate. Later on, this concept will be addressed in more detail.

CHOOSING POLICY INSTRUMENTS

Before going into the aspects related to the choice of policy instruments, it is useful to know what is understood to be a policy instrument. In this thesis, policy instruments are defined as 'measures designed and implemented by public authorities with the aim of achieving policy goals'. Over a dozen approaches or instrument types are distinguished in literature about environmental policy. These range from quite specific orders and prohibitions, through limitations on the amount of pollution that may be emitted per time unit or charges on each unit of emission, to the provision of information about what is being emitted by particular companies or plants (Russell, 2001: 9). These are all instruments that aim to influence the behaviour of target groups in society, also referred to as steering instruments¹⁵. A number of factors can be distinguished that influence the effects (and thus indirectly the choice) of environmental policy instruments. The ones considered most important for this thesis are discussed directly below.

Spatial variation

In general, attaining any chosen environmental goal (except by means of public projects) requires affecting the decisions and behaviour of many independent economic actors (firms, farms, consumers and even government agencies). Often, these actors will incur different (marginal) costs for changing their behaviour (such as discharging less pollution). Besides, the effects of the changes on attaining the underlying policy may also depend on the location. Influenced by different environmental circumstances, sources located in different places will therefore produce different effects on (the measured) ambient quality for similar changes in pollution discharges. According to Russell (2001), in the design of economic instruments, these spatial variations should be taken into account in order to meet the criterion of specificity. In economic terms, policymakers should look for a cost-effective

¹⁵ The strategy for policy of influencing the behaviour of target groups in society contrasts with that of projects undertaken by public authorities to publicly provide for goods or services (deemed) needed in society. These two strategies can be seen as the two basic strategies for public policy.

scheme. Cost-effectiveness and efficiency are generally considered as major advantages of economic steering instruments over command-and-control instruments. However, as institutional economists (see chapter 3) will argue, the exercise of achieving specificity may substantially enhance the complexity of the scheme (and thus, amongst others, enhance the costs of administration), which may compromise its cost-effectiveness and/or efficiency.

Temporal variation

Beyond the current situation, as captured by 'static' models, there will be opportunities for actors to try to change their own cost-benefit balance related to the environment by investing in new technology. Besides, over time, changes not or only indirectly related to environmental policy, such as changes in consumer tastes (preferences), communication technology, even the organisation of firms, will change the set of actors, their locations and relative sizes. These changes in exogenous variables will complicate the choice for policy instruments. (Models of) Instruments that aim to take into account temporal variation will need to possess some degree of flexibility to adapt to these changes. Since economic steering instruments in principle leave choices to the target groups of the instrument, these target groups may adapt their strategy as a consequence of the exogenous changes as mentioned before. Because of this characteristic, economic steering instruments are often attributed the required flexibility in the face of change. The discussion above stressed the importance of spatial and temporal scale for the choice of policy instruments and evaluation methods. Therefore, these aspects will be included in the analytical framework of this thesis, which is constructed to explain choices made with regard to economic policy instruments and evaluation methods.

MONITORING AND ENFORCEMENT

In general, choosing a goal and a method (or methods) by which to try to accomplish it implies that some government agency has put itself in the position of forcing private actors, such as firms, farms or consumers (or all three simultaneously), or other public actors, to do things they would, selfishly, be better off not doing. It seems unquestionably true that firms, farms, consumers and even government agencies, put in such a position will be tempted to ignore the order, unless they fear the consequences of being caught at it. Intuitively, it is probably clear that different policy instruments imply different problems of finding cheaters. Some considerations affecting monitoring include:

- how good the measurement equipment is (its accuracy and precision);
- How quickly the source can adjust to look as though it is in compliance if it receives a warning of an impending check (the sensitivity to fraud);
- And how expensive the monitoring effort is.

These considerations may result in criteria for the policy instrument to be implemented. Beyond monitoring – following from it – are the enforcement actions taken. Based on an analysis of the dimensions of monitoring and enforcement, Russell (2001: 244) comes up with a set of criteria for a monitoring and enforcement system (and thus indirectly for the environmental policy instrument(s) to be used). For a detailed discussion of these criteria, I refer to Russell (2001). As shows from the above, the steps of monitoring and enforcement have their specific characteristics and bring along specific choices that may influence the choice of policy instruments and evaluation methods.

2.2.4 POLICYMAKING AND UNCERTAINTY

In the process of policymaking, including the choice of policy instruments, both technical aspects (and thus criteria) and political aspects (and thus criteria) play a role. Technical considerations relate to questions like whether or not a policy goal can be attained by applying certain instruments while staying within the framework of conditions that were raised for achieving this goal. These technical considerations are, by definition, fairly pragmatic in nature. The formulation of a framework of conditions within which a certain goal has to be achieved is, just as the goal itself, a political matter. Political criteria thus set the boundaries (conditions) for achieving a policy goal, while the technical criteria can be regarded as an 'operationalisation' of these political preconditions. In this process of setting goals and conditions for attaining it, dealing with risks and uncertainty plays an important role. Therefore, these aspects of policymaking will be paid attention to separately in this subsection.

According to Russell (2001), economics, and its relative, decision analysis, provide both descriptive observation of and prescriptive guidance on dealing with uncertainty¹⁶. The prescriptive guidance states the following about the way to use the available information to arrive at a choice of strategy in the face of the unknown and unknowable future: 'for any situation there will be several possible ways to identify strategies for achieving policy goals, and in general, they will produce different 'best' strategies. These different ways to identify a 'best' strategy can themselves often be categorised as conservative ('risk averse'), neutral, or aggressive ('risk seeking'). If it is possible to decide in advance among those general mind sets, then one or another of the choice techniques may seem most appropriate' (Russell, 2001: 10). In the discussion of policymaking so far, policy goals seemed to come out of the blue. This, off course, is not the case in reality. A range of motives, that can either be paradigmatic or pragmatic in nature, influence the choice of policy goals and the way to achieve these. An important factor in the choice among the mindsets as referred to above is the paradigms adhered to by the actors involved in decision-making. In the first step of their translation into policy, these belief systems are reflected in policy principles adopted for a certain policy domain or issue. For example, with regard to water pollution, the policy principle can either be the 'precautionary principle', which is risk averse, or the 'cost-benefit principle', which is in general more neutral or risk seeking. These principles rest on different assumptions about the substitutability of natural capital by man-made capital. The total of 'assumptions about the substitutability of natural capital by man-made capital', the overall way of behaving in respect of the environment and the way this thinking is reflected in institutions is referred to in this thesis as 'paradigms regarding the man-nature relationship'. These paradigms are an element of a larger group of paradigms referred to as 'policy paradigms'. These policy paradigms act as guidelines for actors involved in formulating

¹⁶ There is an old distinction, which remains in much of the literature, between risk – situations in which the probabilities of possible outcomes are known – and uncertainty – in which these probabilities are not known. Russell (2001: 14) argues that if we take seriously the proposition that probabilities are always available, even if only from subjective expert judgments, then the need for the distinction disappears. Therefore, he uses 'risk' and 'uncertainty' as synonyms. Note that in institutional economics, as will be discussed in chapter 3, a distinction is made between 'limited' and pervasive uncertainty. A parallel can be drawn between both classifications.

policy. In the case of the 'man-nature paradigm', this guiding function will mainly address environmental and economic policymaking. Policy paradigms, in turn, are an element of the total group of paradigms, which also includes, for example, scientific paradigms¹⁷. In this thesis, the distinction between belief systems and paradigms is interpreted as follows: whereas belief systems are actor-specific in nature, paradigms can be seen as 'blue prints' of shared belief systems and the way these beliefs should be made operational in society.

The cost-benefit principle and the related economic evaluation method cost-benefit analysis (CBA) originate from the weak sustainability-paradigm. Under this interpretation of sustainable development, it is not thought necessary to single out the environment (natural capital) for special treatment. Rather, it is simply another form of capital. Therefore, in this interpretation, what is required for sustainable development is the transfer to future generations of an aggregate capital stock no less than the one that exists now (this principle is referred to as 'the weak sustainability constant capital rule'). In this approach, it is possible to pass on less environmental capital to future generations, as long as this loss is offset by increasing the stock of roads and machinery, or other man-made capital. Alternatively, we can have fewer roads and factories, so long as we compensate by having more wetlands or mixed woodlands or more education. Weak sustainability is, so to say, based on the assumption of perfect substitutability between different forms of capital.

The precautionary principle, on the other hand, originates from the strong sustainability-paradigm. Under this interpretation of sustainable development, perfect substitution between different forms of capital is denied as a valid assumption. The argument is that some elements of the natural capital stock are unique and thus cannot be (fully) substituted for by man-made capital. Some of the functions and services of ecosystems are essential to human survival (they are life support services) and cannot be replaced. Other ecological assets are at least essential to human well-being, if not exactly essential for human survival – such as landscape, space, and relative peace and quiet. These assets are critical natural capital and since they are not easily substitutable, if at all, the strong sustainability rule requires that we protect them. Moreover, many uncertainties still exist with regard to the functioning of ecosystems. What is their carrying capacity (how much pollution can they absorb)? What are their critical sizes (how large do they need to be to sustain themselves and to recover from damage)? Do ecosystems provide goods and services, the utility of which has not been discovered by mankind yet (f.e. medicines)? The strong sustainability paradigm states that as long as these questions have not been answered (and they never fully will be), and as long as the effects of human activities potentially endanger the capacities of ecosystems, the precautionary principle should apply.

The type of paradigm adhered to, the risk strategy represented by that paradigm and the types of policy principles related to it are likely to influence the choice of policy programmes and policy instruments. Application of the precautionary principle is likely to result in bans on or strict regulation of toxic substances, while a cost-benefit approach is likely to result in economic incentives to reduce their production or use. As was mentioned before, a central

¹⁷ For a further discussion of paradigms (including those regarding the man-nature relationship) and their role in policymaking, I refer to chapters 3 and 4 of this thesis, to Turner et al., 1994: 55 and further; and Colby, 1993.

characteristic of market-based policy instruments is that they provide economic incentives and leave the choice between a set of alternatives to economic actors. However, through policy, some choices may be made so (economically) favourable that other alternatives are not even considered or vice versa, so unfavourable that that alternative is not even considered an option. Command and control instruments also provide certain incentives and leave target groups of policy a choice between a number of alternatives. However, by applying these instruments, in some situations certain alternatives may be completely removed, so that the range of options is actually and actively limited. In other words, economic instruments in principle do not limit the range of options for target groups, while command and control instruments may. From the discussion above, it follows that regulative instruments are more repressive in nature than economic instruments. Whether they also lead to less environmental damage and natural resources use depends on their environmental effectiveness as compared to economic instruments. Theoretical insights about the effectiveness and efficiency of economics instruments as compared to command and control instruments will be discussed in chapter 3.

By discussing the linear interpretation of policymaking¹⁸, a number of concepts were introduced that can be regarded as important elements of this policymaking process. Examples of such concepts are (policy) paradigms, principles, goals, instruments, discourse, actors and operationalisation. Both the discussion of the choice of policy instruments and the issue of monitoring and enforcement in the previous subsection mainly addressed technical criteria policy programmes and instruments have to meet in order to 'do the desired job', i.e. to attain the policy goals set, and to do this in an acceptable way. In other words, these elements of policymaking are fairly concrete and pragmatic in nature. According to the interpretation presented in this subsection, in the stage where instruments and monitoring are considered, the major political choices have already been made. The discussion of dealing with risks and uncertainty highlighted a typical political aspect of policymaking, which is more related to abstract and ideological aspects of policymaking preceding the choice of instruments and monitoring. Elements of policy more related to this ideological component are policy paradigms, principles and goals. This discussion showed that fundamental attitudes towards taking risks with regard to the environment may be very decisive for the strategy chosen in policy, and thus, ultimately, for the choice of policy instruments and methods. In the next section, some of the concepts introduced in this subsection and their position relative to each other will be addressed in more detail.

2.2.5 ELABORATION OF ELEMENTS OF POLICY AND THEIR RELATIONSHIPS

In subsection 2.2.2, policymaking was defined as 'a series of actions or operations undertaken by actors involved in policy, conducing to an end'. Generally speaking, (economic) policy instruments and evaluation methods can be regarded as means towards a

¹⁸ Note that the process of policymaking as discussed in this subsection addressed steering instruments for environmental policy. These instruments relate most to water quality management. The process of policymaking regarding measures for water quantity management and the use of economic evaluation methods may show different specific characteristics. However, for now, it is assumed that the elements of policymaking as discussed here are, generally speaking, the same for these processes.

certain end. The 'end' served by these instruments and methods may be the formal policy goal they were suggested for, or some other goal(s). In order to understand the role of economic policy instruments and evaluation methods in Dutch water management, it is therefore deemed necessary to understand which goals these instruments and methods serve. For this purpose, not only the instruments and methods themselves, but also other elements of policy need to be analysed. Besides, it needs to become clear how these elements of policy relate, how actors involved in policymaking think about these elements with regard to specific issues in water management and discuss these elements with other actors, and how the outcome of this debate influences the use of economic instruments and methods. In this subsection, the elements of policy presented in the previous subsection and their relationships will be discussed more explicitly for the purpose of constructing an initial framework for empirical analysis. Elements of policy considered essential for this framework are paradigms and belief systems, principles, concepts, goals, instruments and methods.

It was argued in the previous subsection that the 'risk attitude' of actors involved in policymaking comes forth from their paradigmatic view. In case of environmental policymaking, the most important paradigmatic view of actors involved is that regarding the man-nature relationship. This category of paradigms is also considered important for water management, especially with regard to issues related to the environment, such as water quality management and water quantity management with impacts on nature. Examples of other categories of paradigmatic considerations relevant for water management are people's fundamental views on equity and freedom of choice. Paradigmatic views are often expressed in policy principles, which in turn act as guidance for more pragmatic choices in policy, such as choosing policy goals and instruments. Sometimes, policy principles are not explicitly formulated, so that it seems that policy goals are chosen out of the blue. However, in this thesis, it is assumed that all policy goals are (partly or completely) based on (the interaction between various) policy paradigms. Whether or not the process of going from paradigms (or, more precisely, fundamental beliefs) to policy instruments and evaluation methods involves an intermediate step in the form of implicit or explicit policy principles is a matter of empirical analysis. Later in this thesis, it will be argued that the risk attitude of policymakers need not be completely based on their (fundamental) paradigmatic view. Instead, it is proposed that the degree of risk aversion may be determined by practical and/or fundamental considerations as well.

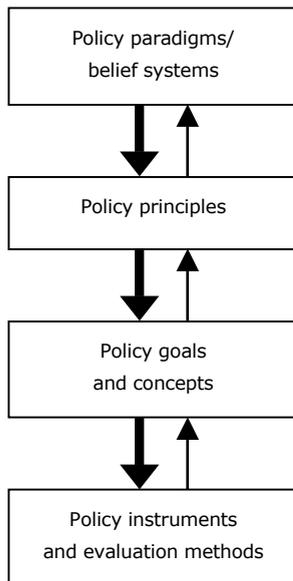
The discussion of the attitude of policymakers towards risk and uncertainty showed that the steps in policymaking as presented at the beginning of this chapter are part of a broader process of policymaking. Two important steps precede the steps identified in this chapter so far: 'choosing' a paradigmatic view and formulating policy principles¹⁹. The discussion about paradigms and policy principles in the context of risk attitudes showed that these aspects (or steps) of policymaking are important for the policymaking process as a whole, since choices

¹⁹ The word 'choosing' is put between brackets, since later in this thesis, it will be argued that the paradigmatic view of the policymaker regarding a certain issue and the way to approach this issue through policy is the result of a complex process of interactions between actors, which do not only consist of 'the policymaker' (if 'the policymaker' exists at all), but of a complex web of stakeholders involved in the issue at hand. In this context, the question is whether policymakers really choose a paradigm or whether one is imposed upon them.

at this level may act as guidelines for choices at other ('lower') levels of policymaking. I deliberately talk about 'levels' of policymaking, since it can be argued that some choices in policymaking are more fundamental than others. In other words, it can be argued that there is a certain hierarchy in the various choices to be made in policymaking. Generally speaking, the more practical (or pragmatic) choices are more easily changed than the fundamental choices. This can be explained by a comparison with an individual's belief system, in which fundamental ('core') beliefs are also less easily changed than practical beliefs²⁰.

However, this hierarchy in belief systems does not automatically mean that the types of choices regarding aspects of policymaking that are lower in rank cannot influence the ones higher in rank. Obstacles in the operationalisation of fundamental choices may cause actors to abandon their fundamental point of view for the sake of compromising, for achieving specific policy goals (achieving the goal legitimises all means) or for sheer progress in policymaking. However, this bottom-up process of influencing is less direct and therefore, less easily observable. Besides, it is less relevant for the purpose of this thesis. Therefore, it will not be discussed further. The various types of choices (and the related elements of policy) and their relative positions are represented by figure 2.2 below. In this figure, the hierarchy of elements decreases when going down. It must be indicated that this figure is a formal, incomplete and static representation of the process of policymaking. It serves as input for building a more comprehensive and dynamic analytical framework in the remainder of this chapter.

Figure 2.2: initial schematic representation of elements of policy and their relative position



²⁰ For a discussion of layers in an individual's belief system, see chapter 3 or Sabatier, 1994.

The figure above requires some explanation. Firstly, it was argued above that the direct influence of the elements higher in the figure on the elements lower in the figure is larger than vice versa. However, since indirect influence of the lower elements on the higher does exist, the arrows go both ways. Secondly, while going down in the figure, elements become more concrete. This process of translation of abstract elements into ever more concrete elements is generally referred to as *operationalisation* of policy. When going down in the figure, besides becoming more concrete, the elements also become more formal. In other words, the meaning of these elements and rules about the use of these elements become more official. The term official refers to the fact that formal elements have more direct and enforceable consequences. This process is generally referred to as the process of *institutionalisation*.

Most elements mentioned in the figure and relationships between these elements were already discussed to some extent in the text preceding the figure. So far, however, the elements of (policy) goals and (policy) concepts were not discussed explicitly yet. With regard to goals, it was already mentioned that a distinction can be made between formal and informal goals of policy. Informal goals can be goals formulated by individual (groups of) actors in policymaking. These personal goals may be in line with or conflict with the formal goals formulated in policy resolutions and papers. Besides the distinction between formal and informal goals, a distinction can be made between primary goals and secondary goals. The primary goal can be regarded as the desired end state of society as formulated in policy and to be reached through the implementation of that policy. Primary goals may be formulated in very abstract terms and are often quite directly related to worldview of actors involved. Since they may be very ambitious and since it may not be directly clear how this goal can be reached, more pragmatically formulated derived (intermediate) goals may have to be formulated. These goals may act as milestones to be achieved in the pursuit of the primary goal. The risk with regard to these derived, secondary goals may be that they become a goal in themselves. As a consequence, the overall goal is lost out of sight.

For (policy) concepts, a similar reasoning may be used. Concepts can be defined as 'philosophical notions' (Geerts and Den Boon, 1999). Defined as such, concepts may be an element of paradigms, through which fundamental beliefs are expressed. In that sense, they are likely to be very abstract and ideological in nature. When referred to as policy concepts, concepts automatically get a more practical annotation as a means towards an end. As such, they can be interpreted as a step in the operationalisation of abstract concepts into concepts that can help achieve the desired state of the world, as formulated in worldviews and paradigms, to be reached through policy. Within the category of policy concepts too, a distinction can be made between overall, abstract concepts and operational concept. An example of the former relevant for this thesis is 'integrated water management'. Examples of the latter are 'water systems approach' and 'eco-pragmatism', which both are 'operationalisations' of 'integrated water management'. Both policy goals and policy concepts are initially elements of the debate (discourse) between the actors involved in policymaking and are thus elements of language. The meaning given to these elements can vary among actors involved. Since the meaning given to these elements is decisive for the way these concepts are made operational in processes of policymaking, actors can use varying interpretations of these goals and concepts as a resource to achieve their personal goals in the policymaking process. This process of giving meaning to goals and concepts and the way

to use this specific meaning in a strategic way will be discussed in more detail later in this chapter.

For the purpose of analysing the formulation, operationalisation and institutionalisation of policy, the analytical framework will be elaborated later on to better enable the analysis of *processes*. Central in that elaboration is the concept of policy arrangements. In the remainder of this chapter, it will be made clear how these dimensions relate to the elements of policy as presented in the figure above. The elements of policy as discussed above will be expressed in terms of this framework of policy arrangements. As will be argued there, they can be regarded as institutions and therefore are part of the 'institutions' -dimension of policy arrangements. The process of elaborating the analytical framework to enable the analysis of policymaking as a process will start in the next section with the discussion of a number of new concepts (such as policy issues), specific phases in policymaking not yet discussed (such as societal and political agenda setting) and processes leading from abstract and informal elements of policy to concrete and formal elements of policy, such as the struggle for discursive hegemony and the already mentioned processes of operationalisation and institutionalisation of policy. The relative position of these latter processes can be interpreted as going from abstract to concrete as well. Discourse is not always a very tangible and well-documented activity and usually does not have a formal status. Through discourse, policy goals and the way to reach them may become more explicit, but are not necessarily written down. This is mainly done in the stage of operationalisation of policy, in which goals and strategies as agreed in discourse are written down and worked out in ever more detail. Finally, in order to give this policy impact in society, it will need to be formalised, and thus institutionalised.

2.3 TOWARDS A BROADER PERSPECTIVE: BUILDING BLOCKS OF AND PROCESSES IN POLICY ARRANGEMENTS

2.3.1 INTRODUCTION

Several scholars have studied the use of economic instruments and evaluation methods in environmental and water policy, both from a theoretical and an empirical perspective (see for example the references in chapter 1). The nature of most of these studies can be characterised as normative. These studies were usually performed in a quantitative way, by using the perspective of a single scientific discipline (mostly economics) for analysis. In these studies, the policymaking process is presented from the point of view of policymakers making fairly independent, rational choices. Such studies can be referred to as secondary theories (see figure 2.1 at the beginning of the chapter). They may be valuable for certain purposes, but they only handle a narrow perspective, which (deliberately or not) selects a number of performance criteria and leaves out others. They aim to analyse the functioning of policy instruments objectively, but in this attempt they do not explicitly deal with the context in which decisions about the role and content of these instruments are made. The choices made in these studies for the objective analysis of these instruments can themselves be regarded as subjective in nature. Therefore, it can be questioned whether or not these studies are really as objective as some of them claim to be. Important analytical aspects, such as the discourse about the role and content of these instruments, the actors involved,

their interests, motives, views and strategies, the resources they use, and the effects of these instruments on society as a whole often do not play an explicit role in such analyses. In other words, these studies usually do not go beyond the analysis of the performance of instruments with regard to a number of quantifiable technical and political criteria. Besides, they evaluate the effects of these instruments, without explaining why the instruments were implemented the way they were. As such, they are fragmented and (thus) not comprehensive in nature. Clear parallels exist between these studies and the perception of Russell (2001) as presented earlier in this chapter. Such studies do not suffice for the purpose of explaining the choice of economic instruments and methods in Dutch water management, as is the purpose of this thesis. Compared to these studies, the analytical scope of this thesis therefore has to be widened to include elements (such as actors, motives, institutions, discourses, etcetera) that allow the analysis of policymaking as a process, as was argued before. Besides, the formalised steps of policymaking as presented by Russell (2001) have to be complemented with a number of other steps (or rather phases or dimensions) to include in the analysis earlier, less formal steps, the possibility of loops between the steps and (partial) reiteration of these steps²¹.

For the purpose of explaining the role of economic policy instruments and evaluation methods in Dutch water management, in this thesis, the context in which decision-making about these instruments and methods takes place thus plays an important role. The context of policymaking is defined in this thesis as 'all factors that influence the process of policymaking (policy formulation and implementation) and relationships between these factors'. Since in this thesis, it is assumed that the outcome of the policymaking process is contingent on a large number of factors, the process, as the word already indicates, is understood to be dynamic in nature. This means that (intermediate) outcomes of the process may be adapted or repealed and that (parts of) the process may be repeated, perhaps even several times. Besides, in most instances, the outcome of the process cannot be anticipated. The process is therefore understood to be complex in nature as well. Based on these assumptions, it is logical to study policymaking processes from a dynamic, contingent perspective. In this thesis, policymaking will be interpreted as such. Although unpredictable, in this thesis, the policymaking process is structured into a number of identifiable stages (including the ones identified before, see Russell (2001)) for analytical purposes. The order of the stages, the dividing lines between the stages and the duration of each of the stages is however typically unclear or unpredictable. This is especially the case for complex policy issues and comprehensive approaches to these issues. Since integrated water management aims to be comprehensive, issues and approaches are (thus) typically complex in nature.

2.3.2 OTHER ELEMENTS OF POLICYMAKING AND NEW ANALYTICAL CONCEPTS

Earlier in this chapter, the policymaking process was presented as consisting of a number of steps: setting goals, choosing policy instruments, implementation of policy instruments, monitoring and enforcement and policy evaluation. Later, it was argued that a number of

²¹ Note that a distinction is made between 'elements of policy' and 'elements of policymaking (processes)'. The former, which were represented by figure 2.2 are dependent variables in this thesis, while the latter are independent variables determining their outcome.

phases precede the setting of policy goals, namely 'deciding' which paradigm will be leading for public policy, and the formulation of policy principles as a first step in the operationalisation of this paradigm to act as guidelines for choosing policy goals, concepts and instruments. Several authors have studied the economic dimensions of these steps. However, as far as I know, the relationships between these elements of policy, ranging from ideological (paradigms, principles, goals) to pragmatic (programmes, instruments, monitoring and evaluation), have not yet been studied coherently yet, let alone from the perspective of economic dimensions, not to mention for the policy domain of water management in The Netherlands. The reason for studying the relationships between these elements of policy is founded in the belief that the more pragmatic elements of policy are determined by more ideological, abstract elements of policy. This also counts for the choice and design of economic policy instruments and evaluation methods in Dutch water management. Such a study requires the analysis of the trickling down of policy from higher levels of governance to lower levels of governance, and of the interaction between these levels of governance.

In this thesis, it is assumed that this process of 'trickling down' of the influence of the more abstract elements of policy consists of decisions made by actors in a 'field of forces', created by the total of actors involved, their interests and motives, the resources and power they possess and their strategy for achieving their personal goals. This field of forces is believed to be demarcated and regulated by certain rules. The analysis of this process requires the introduction of a number of new analytical concepts. These new concepts are also considered relevant for analysing and understanding the choice of policy instruments and evaluation methods, for later in this chapter it will be argued that the selection and design of these instruments and methods is determined by a large number of factors that do not only influence policymaking in the actual phase of selecting policy tools and instruments. It is argued that the process of selecting policy instruments and evaluation methods is influenced by other processes in policymaking, such as the discourse²² about the existence of the problem (the ontological discourse) and the discourse about the way to address it (the normative discourse). These discourses typically take place in a broad context, involving several types of stakeholders in various arenas²³, such as the political, economic and scientific arena.

2.3.3 OTHER PERSPECTIVES ON AND ELEMENTS OF POLICYMAKING

In the previous section, the discussion of criteria for the selection of policy instruments and evaluation methods was mainly held from the perspective of those actors that were presumed to be the policymakers (politicians and civil servants). This perspective may give the impression that these actors are the only actors involved in decision-making about policy. Although, since they have been granted some degree of democratic legitimacy, they play an important part, it is assumed in this thesis that these presumed policymakers do not operate in an isolated manner. Rather, they are influenced by a range of other stakeholders involved in the policy issue at hand. As a consequence, various stakeholders involved in the process may apply the criteria mentioned for the selection of policy instruments. These

²² The concept of discourses will be discussed extensively in subsection 3.3.3.

²³ The concept of arenas will be discussed more extensively further below.

stakeholders may (and, as will show from the empirical part of this thesis, usually do) have motives for emphasising certain criteria and neglecting others. Besides, actors may have different perceptions about the meaning of the same criterion and the way policy alternatives should be evaluated with regard to this criterion. In the next section, it will be argued that the 'overall' priority ranking of criteria for choosing policy instruments and the design of these criteria depends upon the power balance between various stakeholders involved in policymaking regarding a specific policy issue.

Besides a more extensive discussion of the role of (other) stakeholders in the policymaking process, the analytical scope of the policymaking process will be further expanded to include the broader societal and political context of policymaking. In this context, a number of dimensions of the policymaking process plays a role that has not been discussed (extensively) yet. Two important dimensions were already mentioned above, namely 'discourses' and 'actors' (the latter of which is shared under the dimension of 'policy coalitions' which will be introduced further below). Other important dimensions that will be introduced are 'institutions', 'power and resources' and 'exogenous factors' (also referred to as 'exogenous variables'). In order to be able to understand the position of these dimensions in the context of policymaking (which is largely constituted by these dimensions), the process of policymaking will first be explained in terms of the analytical concepts of 'arenas', 'discursive hegemony' and 'institutionalisation'. The theoretical concepts of discursive hegemony and institutionalisation play an important role in this thesis in explaining processes of policymaking and their outcomes.

2.3.4 ISSUES AND PUBLIC POLICY ARENAS

So far, in this chapter, we have discussed various aspects of policymaking. However, the reasons for policymaking have hardly been addressed yet. Generally speaking, the reason for public policy, and thus for policymaking, can be regarded as a combination of conditions. The first condition is that some societal phenomenon is considered a problem for this society by (parts of) this society. In other words, these phenomena result in a society that is in a sub-optimal state, and therefore this state, according to (some of the actors in) this society, should be improved. The second condition is that it is estimated that the problem caused by the phenomenon will not be solved automatically, without undertaking specific actions directed at the problem. Finally, it is judged that public authorities can best address the problem, since it is expected that private actors in society will not solve the problem at hand. All kinds of phenomena can be considered a problem for society, such as natural phenomena, either or not caused by humans (f.e., with regard to water management, climate change and the resulting change in patterns of precipitation) and social phenomena (f.e. the pollution of water systems caused by human activities).

As was argued by De Savornin Lohman and many others (see for example Van Tatenhove et al., 2000; Hajer, 1995), public policy is made not in the minds of policymakers, but in 'arenas' consisting of affected actors with their specific values, interests, resources, rights and responsibilities. Various arenas can be distinguished, such as scientific, societal, administrative, political and policy arenas. A policy arena typically forms around a specific policy issue. An issue (*vraagstuk*) can be defined as 'a societal phenomenon that is the object of debate and/or that needs to be solved' (Geerts and Boon, 1999). Different types of

issues can be distinguished, such as societal, scientific and political issues. A political issue is a phenomenon that causes a dispute in the political arena. According to the definition above, a policy issue can be defined as 'an issue that has entered the political arena and that a majority of actors in the political arena (or the dominant ones) have agreed to address through public policy'.

According to De Savornin Lohman (1994), different policy *issues* go with different policy arenas. The same can be argued for *policy instruments*: different policy instruments imply different arenas. The reason for this is that the choice of specific types of policy instruments is likely to lead to the involvement of specific actors in the policymaking process regarding the issue at hand. Besides, the opposite is also true: different arenas are likely to prefer different policy instruments and evaluation methods and different designs of these instruments and methods. Therefore, the arena in which policymaking with regard to a specific issue takes place is likely to have a large impact on the application and design of (economic) policy instruments and evaluation methods. For an interesting illustration of this notion, I refer to De Savornin Lohman (1994) and his discussion of the differences in characteristics between the policy arenas of 'charging' and 'permit giving'.

2.3.5 SOCIETAL AGENDA SETTING

Based on the new insights in the elements and dimensions of policymaking as presented in the first part of this section, the interpretation of phases in the process of policymaking is widened once more. The interpretation as discussed here is largely based on Hajer (1995). According to Hajer, the process of political decision-making starts with the phase of *societal agenda setting*. This phase is all about the recognition of natural or societal phenomena as a *societal problem* (be it local, regional, national or global in nature). Whether or not a phenomenon is labelled a societal problem, depends on two main factors. Firstly, society has to perceive a certain phenomenon. The ease of perception (or detection) of phenomena varies with the type of phenomenon. In many cases, the state of the art of scientific knowledge and technology and the phenomena this knowledge is directed at, determines whether or not a phenomenon that is difficult to detect will be perceived. As such, knowledge providers (whether public, semi-public or private) may play an important role in the process of agenda setting, by providing the societal arena with data about the existence and magnitude of a phenomenon. This helps society select issues into high priority and low priority. However, even if phenomena and their magnitude can in principle be detected, the number of resources that is required to detect these phenomena may be prohibitive and may prevent this from taking place. The supply of resources for scientific research is largely a political issue and politically involved actors may thus influence activities in the scientific arena as well and as such may steer the detection of phenomena and possibly the assessment of the origin and gravity of those phenomena for nature and society by science.

In the next step of societal agenda setting, a perceived phenomenon has to be regarded as a (environmental) problem. A *problem* can be defined as a phenomenon that is regarded as undesirable by at least one individual. For a problem to become a societal problem, the phenomenon has to be regarded a problem by a large group of actors in society. Many (groups of) actors can act as initiators for making a phenomenon they perceive as a problem into a societal problem by creating public support for the issue. In most cases, these

different (groups of) actors have several pathways to create public support for their view on the cause(s) of the problem and the actions to be undertaken to solve it. In other words, actors can make use of various types of *resources* to further their interest(s). These resources and strategies can be used to manipulate the decisions or position of other actors or, in other words, to gain *power* over other actors or actor groups. The way these resources are used for this purpose can be referred to as *strategies*. Whether or not these actors succeed in influencing other actors determines if a phenomenon will be turned into an issue on the societal agenda. With regard to the use of scientific information, it can be stated that the degree to which scientists agree on the existence and magnitude of a phenomenon is likely to influence the perception by society of this phenomenon as a problem. This may in turn influence the urgency for addressing the problem through public policy and the types of instruments and methods applied. Therefore, the generation and use of scientific information may be an important strategic resource in societal (and political, see below) agenda setting.

2.3.6 POLITICAL AGENDA SETTING AND DISCURSIVE HEGEMONY

If a societal issue is accepted by at least some groups or individuals in the political arena as an issue, the phase of *political agenda setting* begins. The mechanism of political agenda setting is comparable to that of societal agenda setting. Again, some actor groups will try to prevent the recognition of the societal issue as a *political problem*, while others will try to advocate accepting it as a priority in policymaking. These different political and administrative actor groups again have several ways to try to make their view dominant in the political arena. One way to do this is by joining other actor groups with similar interests to form a more powerful coalition (referred to in this thesis as *policy coalitions*)²⁴. The outcome of the stage of political agenda setting depends on which policy coalition is most successful in making its view on issues and solutions the dominant view in the *political arena*. This process, in which policy coalitions try to convince other coalitions of the rightness of their view through debate (i.e. through language and argumentation), is called discourse (see Hajer, 1995). In discourse, the way policy coalitions present their view on the issue is referred to as a *story line* (see below). According to this view on the policymaking process, the *policy approach* chosen by the public authorities is determined by the discourse that has become dominant in the political arena (see De Savornin Lohman, 1994). As such, policymaking can be regarded as the struggle for discursive hegemony (i.e. hegemony in discourse) and consequently the way in which the political arena 'translates' the *story lines* of the dominant discourse into elements of policy.

A story line can be described as a way in which stakeholder(coalition)s present their view on the issue at hand. It consists of both the content of the story (what is told) and the language used (the way it is told). Hajer sees the latter aspect as another resource with which stakeholder coalitions can substantiate their views in discourse. Hajer (1995) argues that by

²⁴ Note that these actor groups that unite in a policy coalition do not necessarily have to have the same motivation for the shared perspective on the issue and the way to address it through policy. It is even thinkable that actors with different paradigmatic views on the issue and the way to address it unite in a policy coalition for pragmatic reasons. However, this is less likely to happen than a coalition between actors with the same or similar belief systems.

using certain vocabulary, one view can be distinguished from another. The goal of the stakeholder coalitions is then to try to make other stakeholder coalitions, especially the ones that have decision-making authority, use the language they use to describe the problem. By using certain language, Hajer argues, other views can be excluded from the discourse, since these views cannot be properly described by that language. By making other stakeholders use that language, some views can be pushed back in the discussion, while others can be pulled to the forefront.

Policy concepts are important elements of story lines. In Van Dale Dutch dictionary, a concept is (amongst others) defined as 'a (philosophical) notion or idea'. In Wolters-Koenen Dutch dictionary (Koenen, 1992), one of the definitions shows similarities with this definition, by defining a concept as 'a plan'. As opposed to the more neutral definition in Van Dale, the definition in Wolters-Koenen has a clear connotation of a structured approach towards a certain goal. In this thesis, a concept is interpreted as a combination of both, i.e. 'an idea or notion that includes a structured approach towards a certain goal'. A policy concept is therefore interpreted as 'a term (word) that represents an idea about the way in which a policy issue can be addressed through public policy'. Therefore, a policy concept can represent a complex total of thoughts (notions, ideas) about how to address an issue, including underlying paradigms. Making other actors in the political arena adopt a policy concept means making them adopt a specific way of thinking about how to address policy issues that may be based on specific beliefs or notions, such as those regarding the relationship between man and nature.

2.3.7 INSTITUTIONALISATION

As was already stated in the introduction to this chapter, actors and institutions are important elements of the policymaking process. Actors that have an interest in influencing policymaking processes are also referred to in this thesis as stakeholders. Whether a stakeholder or group of stakeholders is or is not directly involved in the decision-making process depends, amongst others, on the institutions related to this process. Decision-making processes about issues that have since long been recognised by the political arena, may be 'guided' by institutions accepted by the majority of stakeholders or the most influential ones, determining on forehand who will and who will not be directly involved in the process. In this situation, the policymaking process is embedded in institutions and the policy issue has thus been 'institutionalised'. Decision-making processes about issues that have only just entered the political arena, will have less well-defined institutions regulating the process. In this situation, stakeholders will still have to conquer 'a seat at the negotiation table'. But even if not included in the direct decision-making process, groups of stakeholders may influence this process in various ways. These various ways will be discussed in subsection 2.3.5. dealing with power and resources.

The elements of policy resulting from policymaking processes (see figure 2.2) can be regarded as institutions for addressing the issue at hand. As was mentioned above, the whole process of going from the identification of a phenomenon, via societal and political agenda setting to the formulation of policy is itself guided by institutions as well. Therefore, a distinction can be made between existing institutions guiding processes of policymaking and new institutions as outcomes of policymaking. The link between these two types of

institutions is twofold. On the one hand, institutions regulating the policymaking process influence the outcome of that process. On the other hand, institutions that are the outcome of policymaking become part of the existing institutions and as such may regulate future policymaking processes regarding the issue. According to Hajer (1995) and Van Tatenhove et al. (2000), when going through its consecutive stages, the policymaking process becomes more and more institutionalised, or embedded. From the moment a certain story line has become dominant and policy is based upon this story line, this approach becomes anchored in institutions. This process is referred to as institutionalisation. Institutionalisation can also be described as the development of common norms shared by the actors involved (either or not written down on paper) that are adopted as a reference for decision-making and actions.

Existing policy approaches to certain issues can be replaced by new approaches. However, since the existing approach is anchored in institutions, and institutions are not easily changed, changes to policy formulation and implementation are typically slow and incremental. Stakeholders that are part of or benefit from the existing institutional setting and thus have an interest in defending existing institutions are often powerful, because the institutional framework in place supports their position. Besides, substantial and sometimes prohibitive resources have to be deployed to change institutions. Therefore, existing institutions can act as a resource for the presently dominant actors in a policy arrangement to be used for consolidating the present arrangement. New institutions can either reinforce or alter the position of the dominant actors and their opponents. Whether or not opposing actors succeed in changing the arrangement depends on the power balance between various actor coalitions, which is derived from various types of resources, including story lines and institutions. Later this chapter, I will also discuss a number of exogenous factors that can either stimulate or obstruct changes in policymaking and its outcome. In the next section, I will discuss the analytical concept of policy arrangements and its dimensions.

2.4. POLICY ARRANGEMENTS AS THE CORE OF THE ANALYTICAL FRAMEWORK

2.4.1 INTRODUCTION

In the previous section, in discussing the process of policymaking, a number of analytical concepts and some of their relationships were introduced and discussed. Among these concepts were the dimensions constituting policy arrangements, being discourses, institutions, policy coalitions (actors), and power and resources. According to the theories of Hajer (1995) and Van Tatenhove et al. (2000), in political settings, the identification of the dimensions of a policy arrangement can help give a structured description of decision-making processes in reality. Whereas Hajer focuses on the element of discourse, Van Tatenhove et al., as a reaction, or rather as an addition to Hajer, put more emphasis on the organisation (structure) of policymaking processes. By doing so, they aim to provide for an analytical framework that provides a better balance between what they call substance (referred to by Hajer as 'discourse') and organisation (actors and coalitions, institutions, power and resources) and a better explanation of the interaction between these two aspects. So far, the separate dimensions of policy arrangements were not addressed in detail yet. This will be done in this section. In section 2.5, the mutual relationships of these dimensions and their

relationships with other elements of the analytical framework for analysing policymaking, such as exogenous factors, selection criteria and the elements of policy will be discussed.

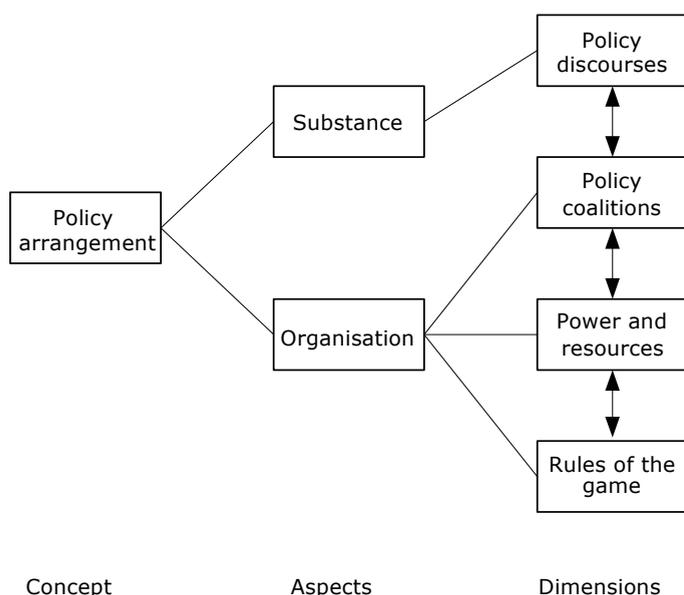
The approach by Van Tatenhove et al. (2000) was developed for the analysis of processes of change in environmental policy. The central goal in this approach is the 'analysis and understanding of the nature and direction of processes of organisational and substantive renewal in environmental politics' (Van Tatenhove et al., 2000: 5). It is stated by the authors that in the last two decades of the 20th century, a number of social and political scientists have studied the renewal of environmental policy as a process of institutionalisation. Institutionalisation, in its sociological meaning, refers to the permanent process of construction and re-construction of both substance and organisation of (environmental) policy. According to Van Tatenhove et al. (2000), in their analyses, these scientists pay attention to (a) the *naming* of environmental problems as societal problems (societal discourse) and the *framing* as political problems (political discourse), (b) the series of consecutive dominant styles of governance and the translation of environmental policy into policy instruments and (c) the organisational design of environmental policy ('institutionalisation'). The central argument of Van Tatenhove et al. with regard to these studies is that, because they not only present a unilinear perspective, but also handle an instrumental focus, they do only partly justice to the multidimensional appearance and complexity of developments and changes in environmental policy. Therefore, Van Tatenhove et al. present an analytical framework that exists of the combination of the concepts of 'institutionalisation', 'political modernisation' and 'policy arrangements'. As such, compared to the other scientists, Van Tatenhove et al. aim to put more emphasis on the mutual interactions between actors and relationships between actors, discourse and structure. This central argument of Van Tatenhove et al. with regard to the unilinear and instrumental focus of secondary level theories was already subscribed in this thesis, for the same reason (that they only partly do justice to the multidimensional appearance and complexity of developments and changes in, in this thesis, (integrated) water management).

The central theme in the work by Van Tatenhove et al. is the interaction (duality) between processes of interaction between actors and processes of social and political change (political modernisation). Focusing on the interaction between actors means focusing on the arguments actors use in processes of interaction, the norms and values these actors have, their definitions of a problem, and their perceptions about the relation between society and nature and about societal and political responsibilities. Political modernisation on the other hand refers to the change in relations between state, society and the market and to new concepts of governance. With regard to political modernisation, Van Tatenhove et al. state that three essential changes are going on in politics: (a) the traditional separation of state, society and market is disappearing, while (b) the interactions between these fields increasingly surmount the nation state, which (c) results in new coalitions between state organs, market actors and societal groups, both on a local and a global level (Van Tatenhove et al., 2000: 48). These three changes together result in new arrangements for addressing policy issues. Whereas in this thesis interactions between actors are regarded as endogenous factors in constituting policy arrangements and their outcomes (thus, in short, of policymaking), processes of political modernisation are regarded as exogenous factors that cannot (directly) be influenced by actors involved in specific policymaking processes. The arrangements resulting from these processes may either reinforce or oppose to these trends

in political modernisation, but their individual contribution to these trends is regarded so small that one cannot speak of a significant influence. On the other hand, processes of political modernisation may have a strong influence on specific policymaking processes.

The major analytical concept in the approach of Van Tatenhove et al. is the concept of 'policy arrangements'. A policy arrangement is perceived as the substantive and organisational stabilisation of a policy domain, existing of four dimensions: coalitions, rules, power and resources, and discourses (Van Tatenhove et al., 2000: 7). The schematic operationalisation of the concept 'policy arrangement' is represented in Figure 2.3 below.

Figure 2.3: the concept of policy arrangement, its aspects and dimensions



(Source: van Tatenhove et al., 2000: 56)

The concept of policy arrangement requires some explanation. Firstly, Van Tatenhove et al. (2000) state that the term 'arrangement' has been chosen to express more focus on 'stability' than analysts of 'voluntary policy networks' do. An arrangement links interaction patterns of agents with the socio-political structure in which these actions have to take place. Secondly, according to Van Tatenhove et al. (2000), a 'policy domain' encompasses all policy practices with regard to a policy issue, like climate change, nature conservation or acid rain. One way to draw the boundaries of a domain is by concentrating on (1) the way in which a specific policy issue is formally institutionalised in a political system (such as via ministries, departments and policy plans) and (2) the way in which these formal boundaries are being used and disputed by the relevant players in the policy field. Thirdly, the given definition refers to both organisation and substance, which Van Tatenhove et al. regard as the two key aspects of a policy arrangement (see figure 2.3). Substance refers to elements of policymaking like principles, goals and concepts (the content of policymaking). Organisation

involves aspects like actors, power and resources, departments, instruments, procedures and allocation of tasks, authorities and competencies (the structure in which policymaking takes place). Besides, the notions of time and space²⁵ are part of the definition. The notion of time refers to the way the aspect of time is dealt with in policymaking, for example with regard to allocating public financial resources over time and weighing effects of activities that occur in different moments in time²⁶. The notion of space mainly relates to the scale at which societal activities are undertaken and effects occur, and to the level at which policy is formulated to address those activities.

In the remainder of this section, the dimensions of policy arrangements will be elaborated to give them more meaning.

2.4.2 INSTITUTIONAL FRAMEWORK (RULES OF THE GAME)

INTRODUCTION

An institutional perspective on the process of policymaking implies that how stakeholders make choices in this process matters. Besides, it implies that these choices can be explained by analysing the institutional context in which they are made. North (1990: 3) gives the following definition of institutions (from an institutional economic perspective): 'institutions are the rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction. In consequence, they structure incentives in human exchange, whether political, social or economic. Institutional change shapes the way societies evolve through time' (North, 1990). In other words, institutions establish the framework in which social interactions (are supposed to) take place.

As was depicted in sections about stages in the policymaking process earlier in this chapter, (the choice for) certain policy approaches will gradually be anchored (embedded) in institutions. This process was referred to as institutionalisation. As we will see later on in the discussion of power and resources, the function of institutions is to objectify power relations (Frouws, 1993:19). Once 'objectified' by institutions, power relations will not be easily changed. Therefore, actors that have an interest in gaining or maintaining power over other actors, have an interest in 'institutionalising' this power and in keeping these institutions in place. This can be done both in a formal and in an informal way, as will be discussed below.

Institutions are also referred to as 'rules of the game'. In this thesis, the game is policymaking in water management. North (1990) divides institutions into informal and formal institutions. Formal institutions are those rules of the game that are written down and approved of by either the majority of stakeholders or the most powerful ones. Formal institutions can to varying degree be enforced by the legal system (which is part of the formal institutional framework). They can be laws, regulations, policy resolutions or policy

²⁵ See also Russell (2001) and earlier this chapter.

²⁶ As will show later in this thesis, the weighing of effects of human activities over time also plays an important role in the functioning of economic policy instruments and especially of economic evaluation methods.

instruments used to effectuate the policy described in those resolutions. Informal institutions are non-written rules, made up by the players of the game, or in other words, the stakeholders involved in decision-making processes. They can be rules that are recognised by society, but that are not officially recorded as rules, such as norms of behaviour or internally enforced standards of conduct. An example of an informal institution is an oral agreement about which parties are allowed to play a role in the process, and which actors are allowed to act as a representative of those actors not allowed at the negotiating table. In more general terms, informal institutions are part of the culture of society where they provide order, and include:

- *Extensions of formal rules*: rules that are fully recognised by society, but are not officially recorded as rules;
- *Norms of behaviour*: a principle of correctness that is binding upon members of a certain group;
- *Internally enforced standards of conduct*: include ideas, ideologies and choice.

Formal institutions complement the effectiveness of informal constraints, and North (idem) distinguishes three types of formal constraints with regard to economic interactions:

- *Political rules*: enforcement of agreements about co-operation by political decision-making;
- *Economic rules*: construction of property rights, implemented when the costs allow implementation;
- *Contracts*: binding agreements between people or groups of people.

According to Knight (1992) an institutional analysis can be applied to answer different types of questions. Institutional analysis can be used from an *explanatory perspective*, where analysis of institutional development and change can be used to understand, for example, the history of society and its current events. From a *critical perspective*, institutional analysis may be used to determine whether existing institutions pursue the goals for which they were developed. In other words, from this perspective, institutions are evaluated with regard to their functioning. Alternatively, from a *normative perspective*, institutional analysis helps us to understand the development of institutions, which may give us a direction as to how to reform them. In this thesis, the emphasis will be upon the explanatory perspective, with possibly recommendations about the institutional structure of Dutch water management from a normative perspective at the end of the thesis.

Besides the distinction between formal and informal institutions, another distinction into two categories is made regarding institutions in this thesis. This distinction relates to institutions regulating *policymaking processes themselves* on the one hand, and institutions as an *outcome of policymaking processes* on the other, regulating activities in society. It must be noted that a close connection may exist between these categories, since the activities in society regulated by the institutions resulting from a policymaking process may themselves be policymaking processes. In other words, institutions that result from one policymaking process may act as institutions regulating other policymaking processes occurring later in time.

Informal institutions

Paradigms are an important category of informal institutions for this thesis. This concept was already introduced in section 2.2.4 about policymaking and uncertainty. Since they play an important role in the analytical framework of this thesis, the concept is explored a little further here. Paradigms can be seen as 'systems of norms and values', or, expressed more in similar terms as formal institutions, as 'a framework that has unwritten rules but directs actions'²⁷. Another definition is: 'a set of assumptions, concepts, values, and practices that constitutes a way of viewing reality for the community that shares them, especially in an intellectual discipline' (idem, see footnote). Colby (1990) presents four definitions of a paradigm, which focus on the position of paradigms with respect to (other) institutions, especially rules:

- (1) 'a criterion for choosing problems ... that can be assumed to have solutions. Other problems are rejected as metaphysical, as the concern of another discipline, or sometimes as just too problematic to be worth the time';
- (2) 'the entire constellation of beliefs, values, techniques, and so on shared by members of a given community, or one element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science';
- (3) 'not the same as shared rules; the existence of a paradigm need not even imply that any full set of rules exists' (Kuhn, 1970);
- (4) 'a worldview or mode of perception; a model around which reality is organised' (Berman, 1981).

The first two definitions focus on the problem solving aspect of paradigms. The first states that paradigms act as a criterion to distinguish solvable problems from non-solvable ones. The second emphasises that approaches to problem solving can act as a substitute for explicit rules. A paradigm in this sense is a *modus operandi*, a manual for solving problems, without needing to know the basic principles or rules underlying a specific approach (or paradigm). The idea that the underlying principles and/or rules need not be known for a paradigm to exist or to be adhered to, is stressed by the third definition. Paradigms are thus less concrete than explicit rules. Defined as above, they can be shared under the dimension of 'rules of the game' in the analytical framework for policy arrangements, but clearly belong to the category of informal institutions, which can be less explicit and less traceable than formal ones. As shows from the fourth definition by Colby, paradigms can be seen as a model for organising reality. As such, they act as a framework of reference from which formal institutions (laws, rules, regulations, policy, etc.) and story lines can emerge.

Paradigms can thus be seen as a code of conduct of how to interpret phenomena and how to deal with them. They exist of deep, fundamental beliefs and often also of more shallow (and therefore more easily changeable) beliefs. Paradigms can relate to various activities in society, such as policymaking in general, policymaking regarding specific issues and science. In this thesis, a distinction is made between scientific, political and societal paradigms. These paradigms lie at the basis of scientific, political and societal discourses, respectively. Scientific paradigms are paradigms regarding the way to (scientifically) analyse phenomena in society. Policy paradigms relate to the question whether or not certain phenomena (either

²⁷ Source: <http://ag.arizona.edu/futures/era/paradigmsmain.html>

or not described by the scientific arena) constitute a problem to society and if so, how to address these issues through policymaking. With regard to economic policy approaches to water management issues, paradigms about the relationship between man and nature are considered specifically relevant. These paradigms can be regarded as policy paradigms, since they are normative and/or strategic in nature. In order to limit the scope of research, societal paradigms will not be analysed in this thesis.

2.4.3 POLICY DISCOURSES

In this subsection, the concept of discourse will be addressed, especially that of policy discourse. Before addressing the concept of policy discourses, it is important to know what a discourse is. Many definitions exist of discourses. According to Foucault, a discourse is 'a group of statements that provide a way of representing knowledge about a particular topic at a historical moment; it produces and frames knowledge through language'²⁸. Another definition is 'the means by which language, broadly understood, through the production, distribution, and reception of texts, conveys meaning (especially ideology) on a conscious and unconscious level'²⁹. As shows from these definitions, language is an important constituting element of discourses. Language acts as the instrument for an individual or group to express personal thoughts, ideas, beliefs and knowledge and transfer these to other individuals or groups. So whereas paradigms can be understood as 'a set of beliefs, assumptions, concepts, values, and practices that constitutes a way of viewing reality' (see earlier), discourse is the explicit expression of these beliefs, assumptions, etcetera through language. In this discourse, various actors or actor coalitions, holding different paradigmatic views, confront other actors with their ideas through language and will try to convince these actors of the rightness of their view. Discourses can relate to various subjects, varying from philosophical to pragmatic and from holistic to detailed. In this thesis, discourses will usually relate to the existence and magnitude of phenomena, whether they are considered a problem for society, the definition of the problem and the way to address this problem, either or not through public policy and the use of economic policy instruments and evaluation methods. This interpretation and application of discourse will be addressed in more detail below. Directly above, I already referred to language as an instrument. In the remainder of this subsection and the next subsections of this chapter, we will see that language can be an important resource for gaining power in a political debate.

Now that an idea has been created of what is a discourse, the concept of policy discourse can be addressed. The term *policy* discourse is used to distinguish between general discourses (which may be held by anyone in society regarding any subject) and discourses held in the political arena. This distinction will be adhered to in this thesis. Various definitions of policy discourses exist. Hajer (1995: 44) defines policy discourse as 'a specific ensemble of ideas, concepts, and categorisations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities'. The 'particular set of practices' Hajer mentions usually refers to policymaking processes in specific domains or regarding specific issues. This is also the main interpretation of a 'particular set of practices' in this thesis. Dryzek defines a policy discourse similarly as:

²⁸ See: higherred.mcgraw-hill.com/sites/007248392x/student_view0/glossary.html

²⁹ See: www.bothell.washington.edu/faculty/mgoldberg/terms.htm

'a shared way of apprehending the world. Embedded in language, it enables those who subscribe to it to interpret bits of information and put them together into coherent stories or accounts. Each discourse rests on assumptions, judgements and contentions that provide the basic terms for analysis, debates, agreements and disagreements (...)' (Dryzek, 1997:8). Based on these definitions and in accordance with structuration theory (see Giddens, 1984), Van Tatenhove et al. (2000: 63) define policy discourses as 'dominant interpretative schemes, ranging from formal policy concepts to popular story lines³⁰, by which meaning is given to a policy domain'. According to Van Tatenhove et al. (2000: 56), the 'interpretative schemes' mentioned can consist of 'concepts, ideas, views, buzzwords and the like'. According to the definition by Van Tatenhove et al. (see earlier), a policy domain is not necessarily confined to (addressed by) one public organisation (such as one ministry), and therefore a policy arrangement can involve various policy practices from several ministries or departments (besides various activities by private actors). As a consequence, policy discourse can involve a wide range of actors.

As was mentioned already, the concept of discourse is central to the argumentative approach of Hajer. Hajer sees politics as a struggle for discursive hegemony in which actors try to secure support for their definitions of reality. In his argumentative analysis, Hajer introduces two middle-range concepts: story lines and discourse-coalitions. Story lines are defined as 'narratives on social reality through which elements from many different (political and scientific) domains are combined and that provide actors with a set of symbolic references that suggest a common understanding' (Hajer, 1995:62). Story lines are supposed by Hajer to be essential elements in the clustering of knowledge, the positioning of actors, and, ultimately, in the creation of coalitions amongst the actors within a given domain (Hajer, 1995: 63). Discourse coalitions are defined by Hajer (1995: 65) as 'the ensemble of (1) a set of story lines; (2) the actors who utter these story lines; and (3) the practices in which this discursive activity is based. Story lines are seen as the discursive cement that keeps a discourse-coalition together'.

A policy discourse, which Van Tatenhove et al. (2000) regard as one of the dimensions of a policy arrangement, can be seen as the total of story lines as used by different (groups of) (opposing) actors with regard to a policy issue or a policy domain and the confrontation of these story lines through (linguistic) interaction between these actors. Generally speaking, a policy arrangement can be characterised by one dominant policy discourse (in fact, a story line), the content of which is continuously challenged by (elements of) competing discourses (story lines) (idem: 63). Since a policy discourse typically relates to one policy issue or domain, each issue or domain is likely to have its own discourse.

TYPES OF DISCOURSE

Wiering and Immink (2003: 2) describe a policy discourse as 'the way in which actors give meaning to the substance of policy'. They distinguish three types of discourse: discourses that make a statement about reality (ontological discourse), those that make a statement about desirability (normative) and those that make judgements about strategies to get from reality to the desired state (discourse about strategy or 'route'). According to traditional

³⁰ For a definition and discussion of story lines, see further below.

interpretations of governance, these different types of discourses should be addressed by separate institutions in society. The discourse about reality was to be conducted in the scientific arena, the discourse about the desirable state of society was to be held in society itself and in the political arena and the strategic discourse in the political arena. In this interpretation, science generates ontological input for both the normative and strategic discourse and societal debate results in a normative discourse that acts as input for the debates in the political arena, regarding both normative and strategic matters. However, many contemporary studies argue that the divides between these arenas are fading as a result of various exogenous factors, such as changes in natural phenomena, changes in society and changes in governance (see for example Van Tatenhove et al. (2000) about political modernisation and the changing relationship between state, civil society and the market).

2.4.4 POLICY COALITIONS

Policy coalitions consist of different (groups of) actors that have interests they think they can best defend by forming coalitions with other actors with similar interests. These interests can be diverse, such as similar ideologies, being in favour of a specific policy approach, preferring specific policy instruments, or pursuing similar goals. In terms of Van Tatenhove et al. (2000: 57), the players in one policy coalition share story lines or resources, in the context of the rules of the game. As a consequence, these coalitions identify (more or less) similar policy goals, and engage in policy processes to achieve those goals. In doing so, some coalitions may support the dominant policy discourse or rules of the game, while others may challenge these (*supporting* versus *challenging* coalitions). According to Van Tatenhove et al. (2000), the formation and development of policy coalitions can be studied from at least two perspectives: from a strategic and from an institutional point of view. In the strategic approach, the sharing of a policy coalition is considered to be a strategic choice by actors aiming to achieve their goals and looking for partners with whom policy interpretations are shared and an acceptable consensus can be reached. The analysis of the formation and development of policy coalitions from an institutional perspective has its starting point in the process of political modernisation. This institutional point of view with regard to the formation of policy coalitions will be addressed in the next chapter in relation to Dutch water management. The bottom line of this point of view is that the shaping and existence of policy coalitions is for a large part determined by existing rules predetermining and fixing the position of (groups of) actors.

It can be intuitively understood that the degree to which various actors or policy coalitions are able to influence the policymaking process will vary. Bowler (1999) distinguishes two categories of stakeholders, which he calls the primary and secondary actor dimensions. The actors in the primary dimension are directly involved in the policymaking process, while those in the secondary dimension are not. In this thesis, two criteria are used to distinguish between primary and secondary stakeholders. Stakeholders are considered primary stakeholders if they have *access* to the negotiations in the policymaking process *and* if they hold *power* to influence this process. Actors that cannot gain access to the negotiation table (the arena in which the decisions are taken) are not directly involved, and thus are no primary actors. Nevertheless, actors that do not have access to the negotiations may be able to influence the decision-making process anyway. In that situation, they can be regarded as

influential secondary actors. Actors that do have access to the negotiation table but that are not able to influence the decision-making process do not play a major role in this process and thus are not considered primary actors either. However, this situation is not very likely to occur.

In empirical situations, Bowler divides actors into these two categories based on a subjective assessment of their power. The two categories of actors can also be identified in the theory about policy arrangements by Van Tatenhove et al. (2000). In this theory, the actors that play a role in the existing policy arrangement are part of the primary dimension. The fact that they are part of the existing policy arrangement means that they can influence the policymaking process regarding the issue(s) addressed through this arrangement. Besides, the very fact that they are part of the existing arrangement is an indication that they have acquired a position of power, and, as such, have proven to be influential actors. Those actors that are in the secondary dimension have thus far not succeeded in having their interests represented in the existing policy arrangement. They may wish to acquire a role in the policy arrangement by changing the institutions regulating access to and interest representation in the policy arrangement (i.e., to change the 'process-institutions'). For this purpose, they may apply all kinds of resources, which will be discussed in the next subsection. It should be noted that not in all situations the entry of new (coalitions of) stakeholders results in changes in the institutional framework. The entry of new advocates will reinforce the existing policy arrangement, and thus (very likely) the existing institutions. The entry of new opponents, either or not regulated by formal institutions, may not always result in changes to the outcome of policymaking processes either. This argument is often heard with regard to public hearings in the process of *ex ante* evaluation of large infra-structural projects. Public hearings themselves are regulated via formal institutions (they are obligatory), but no formal rules exist with regard to the processing of information and the consequences of its outcomes. Therefore, the argument is that they have a negligible impact on the overall process and only serve to legitimise the policymaking process.

2.4.5 POWER AND RESOURCES

POWER

As was mentioned earlier in this chapter, stakeholders in the policymaking process as a whole (and thus in the decision-making process about policy instruments as well) use their power to influence this decision-making process. Power can be defined as the ability of one individual, or group of individuals, to force another individual or group of individuals, to act as desired by the individual exerting power and in another way than favoured by the individual whom the power is exerted upon.

According to Van Tatenhove et al. (2000:59), power has to be regarded, on the one hand, as the ability of actors to mobilise resources and, on the other, as a relational and a structural phenomenon of social and political systems. The former refers to political power as a more or less permanent capacity of actors to maintain and transform their social and physical environment, and more specifically to achieve certain policy outcomes (Giddens, 1984; Guzzini, 1993; Held, 1995). Such outcomes may be achieved not only by determining

political decisions, but also by dominating public debates, defining policy issues, setting agendas, or even changing the rules of the game (Bachrach and Baratz, 1962; Krasner, 1985, Strange, 1988). However, to conceptualise power as a mere capacity tends to ignore all those cases in which power is 'covertly', 'unnoticed' or 'unconsciously' exercised (Lukes, 1974). This means that the ability to achieve political outcomes also depends upon the relations of autonomy and dependency between actors 'in which these actors draw upon and reproduce structural properties of domination' (Giddens, 1981: 28-29). In other words, the distribution of power is determined both by the abilities of actors themselves and by the institutional setting in which these actors are embedded (comparable to the institutional view on the shaping of policy coalitions as discussed earlier). Van Tatenhove et al. (2000) state that while it may be true that in the constitution of power agents are able to mobilise authoritative and locative resources, it is also obvious that these resources are unequally divided among actors in any social system. In other words, power is about the asymmetrical distribution of resources (structural phenomenon), revealing itself in relations of autonomy and dependency between actors (relational phenomenon). The more these relations of power are objectified in institutional mechanisms and routines – fixing, so to speak, the allocation of competencies, qualifications, revenues and positions – the more natural and obvious domination seems (Frouws, 1993: 19).

RESOURCES

As was discussed above, actors make use of resources to exert power. These resources can be of great variety, including for example authority, money, human resources, knowledge and even story lines. According to Van Tatenhove et al. (2000), the distribution of resources is an important characteristic of policy arrangements, as, they argue, resources are 'systems of power'. In other words, resources are instruments through which actors can obtain power. The way actor(coalition)s use their resources to obtain power is referred to in this thesis as strategy. Different types of resources and their role in providing power will be discussed below.

Force

Force is probably the oldest resource for power. In stable, well-developed democracies (under which I share The Netherlands), this resource is not often used. Sometimes, this resource is reverted to for suppressing opposition against government policy, for example for halting public demonstrations. However, as long as demonstrations are not violent, they are usually allowed to take place. Therefore, this resource is not likely to play an important role in Dutch water management.

Political and public administrative authority

Public authority can result from force, but in an ideal-type democracy, authority results from a mandate given to individuals by the people to represent them in the government. The authority of government agencies is usually derived from legislation and government regulations (formal political institutions). The process of institutionalisation and the inertia this brings to changes in the political and public administrative systems can lead to a situation in which existing institutions become an ill representation of 'the public will'. In

these situations, institutions that were designed to serve society in a democratic way become instruments of power for minorities.

Financial resources

Resources are distributed differently in different stages of political modernisation. In the early and anti-modernisation stages of political modernisation, the state was the predominant 'power container', drawing upon force and financial power. Generally speaking, the state generated enough financial resources through taxes and enough structural authority to undertake policy programmes and to build infrastructure independent from private parties and without needing the consent of the general public. Contrary to these stages, in liberal arrangements, state authorities depend on those actors that control resources they do not have themselves. Such resources may for example include investment capital for government projects or programmes (such as in the case of public-private partnerships), which provides power to those organisations providing for the financial capital, such as banks and insurance companies. As we will see later in this thesis, land is another important resource for water management government agencies may not possess themselves. The changing power balance between state, market and society (political modernisation) has also affected policymaking in Dutch water management. These mechanisms will be discussed in the empirical chapters.

Human resources

One of the main reasons for actors to form policy coalitions with other actors is to generate more resources. Actors that do not have an institutionalised position in a policy arrangement (that have no structural political power), or do not have enough resources to otherwise exert power in the political arena, often revert to mobilising a large group of supporters to back up their position. The sheer number of supporters may lead to sufficient persuasive power to influence policymakers. A large number of supporters can give a specific story line social legitimisation, which cannot be ignored by political actors that aim for continuity. This tactic is often used by non-governmental organisations. Besides, the generation of human resources can also lead to the generation of other resources, such as financial (e.g. through donations) and intellectual resources ('many know more than one').

Natural resources (property rights)

Natural resources are a category of resources that is specifically interesting for water management. Power to influence the decision-making process regarding water related issues can be derived from holding property rights over a natural resource. With regard to water, these property rights may for example consist of a right to withdraw water from water systems (ground water or surface water) for private activities, the right to pollute water to a certain degree, or the right to withdraw goods or to use services provided by aquatic ecosystems. Besides, property rights may exist for other goods and services that indirectly affect water systems. For example, in sectoral water management, actors holding ownership rights for land were given a powerful position in the management structure of water boards and therefore had a strong influence on local and regional water management activities. In the empirical chapters, we will see that property rights over land also play an important role in new policy arrangements.

Intellectual authority

Authority derived from intellectual property results largely from other actors attributing authority to actors holding this intellectual property. For example, stipulating that a contract is only valid if approved of by an accountant gives this accountant intellectual authority. This authority based on expertise can be formalised in legislation or government rules, as for example in the case of research institutes installed by public authorities as official scientific or research authority for policy studies in a certain policy domain. Examples of such institutes related to Dutch water management are RIVM for environmental policy and RIZA and RIKZ for water policy. Another type of institution attributed with 'intellectual authority' is (temporary or permanent) commissions installed by government agencies to investigate specific policy issues. Examples of such commissions in Dutch water management are the commission for water management in the 21st century (*Commissie Waterbeheer in de 21ste eeuw*) and the Commission for integrated water management (*Commissie integraal waterbeheer*). Scientific knowledge generated by institutions bestowed with 'intellectual authority' can be used to legitimise a claim for a specific (ontological, normative or strategic) discourse (Immink and Wiering, 2003:184).

Story lines

As was argued before, language can be an important source of power as well, both in the societal and political arena. The concepts of discourses and story lines were already discussed earlier in this chapter. Policy coalitions can use story lines to convince other policy coalitions (especially those actors that hold the political or administrative authority to take the final decision) and to gain support from their grass roots. As argued earlier, paradigms (scientific, social and policy) are an important constituting element of story lines. The struggle for discursive hegemony in a political debate is therefore usually also struggle for 'paradigmatic hegemony'. Whereas in sectoral water policy, for a long time the 'frontier economics'-paradigm held paradigmatic hegemony, in present-day water management, there is a constant struggle for paradigmatic hegemony between supporters of several paradigms. Paradigmatic and discursive hegemony will to a large extent determine which actor coalitions get a central position in a policy arrangement.

Institutions

In the description of the policymaking process as interpreted so far, institutions are the result of policymaking. These institutions act as a formalisation of the outcome of the struggle for discursive hegemony regarding a policy issue. As such, they reflect the dominant discourse, which in turn reflects the power balance between the actors involved in this discourse. At the same time, however, these institutions can act as resources in later processes of policymaking in which these or other actors are involved. Therefore, institutions objectify power balances between actors. In other words, they make these power balances formal and impersonal in nature.

Sections 2.4.4 and 2.4.5 discussed the analytical concepts of policy coalitions, power and resources. Power is the ability to 'get what you want' by manipulating other actors. In other words, power is the ability to influence other actors. This also counts for the content and role of policy instruments and evaluation methods. Both policy coalitions and resources can be seen as means to obtain power. The way these means are used to obtain power is referred to

as strategy. Strategies may be of varying kind. Actor(coalition)s may try to influence the use of economic policy instruments and evaluation methods in a direct or indirect way. For the observation that actors are able to influence the policymaking process, one does not need to use the analytical concepts of policy coalitions, resources and strategies. However, for the explanation of this ability to exert power, one does.

2.5 RELATIONSHIPS BETWEEN DIMENSIONS OF THE POLICY ARRANGEMENT AND ELEMENTS OF POLICY

2.5.1 INTRODUCTION

The previous section presented the elements of a model for the analysis of policymaking processes based on theory about policy arrangements. Policy arrangements will constitute the core of the analytical model of this thesis. However, the concept of policy arrangements as described thus far is considered insufficient as an analytical model for this thesis. The reason for this is that the dimensions of the policy arrangement have not yet been linked to each other and to a number of other important elements of the analytical framework. These other elements of the analytical framework are the elements of policy as presented earlier this chapter, the level of individual actors and exogenous factors, such as trends in society. The level of the individual actor and the level of exogenous factors constitute two additional levels of analysis in the analytical framework of this thesis. The relationship between the dimensions of the policy arrangement and the elements of policy as presented before will be discussed in this section. These relationships between the three levels of analysis (individual actor, policy arrangements and exogenous factors) will be addressed in the next.

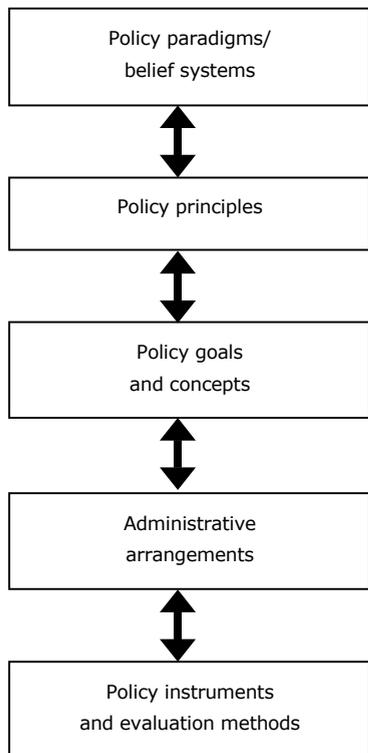
In subsection 2.5.2 I will discuss the relationships between dimensions of a policy arrangement itself and their relationship with elements of policy, which are part of the institutional dimension of these arrangements. However, before addressing these relationships, I will discuss an important distinction made in this thesis with regard to policy arrangements. Policy arrangements were defined earlier in this chapter as 'the substantive and organisational stabilisation of a policy domain....' (Van Tatenhove et al., 2000:7). A policy domain, according to Van Tatenhove et al. (idem), encompasses 'all policy practices with regard to a policy issue, like climate change, nature conservation, acid rain, etcetera'. It can be argued that water management involves a range of policy issues, including the ones mentioned above, together with for example transport, agriculture, protection of land from water and water pollution, and therefore also involves a range of policy domains. As a consequence, water management will also involve a (vast) range of policy arrangements, each addressing different (combinations of) policy issues. Such policy arrangements may partly overlap, since many issues in water management are related (such as for example climate change, nature conservation, transport, agriculture and protection of land from water). As a consequence of this interrelatedness, policy arrangements in water management are likely to be complex in nature.

Besides the somewhat abstract and complex policy arrangements relating to (overarching) policy domains, another type of arrangement can be distinguished that is more concrete in nature. This type of arrangements is constructed to effectuate policy formulated for specific

issues or combinations of issues. Therefore, they involve specific evaluation methods and policy instruments. Such arrangements will be referred to in this thesis as '*administrative arrangements*' or '*governance arrangements*'. Administrative arrangements are very relevant for the analysis of the role of economic policy instruments and evaluation methods in Dutch water management, because they relate directly to specific policy instruments and methods. Besides, they make concrete which actors will be involved in the execution of policy and in what way the execution of policy will redistribute property rights and other resources among the actors involved. This possible redistribution of rights and resources is likely to affect the strategic position and power position of these actors. Since (the more abstract) policy arrangements in water management are presumed to be complex in nature (see above) and since its elements are not always directly related to (economic) policy instruments and evaluation methods, they will only be analysed in so far as needed to analyse and explain the role of economic policy instruments and evaluation methods in Dutch water management. It is assumed in this thesis that the scope and content of administrative arrangements (in terms of its dimensions) is determined by the type(s) of policy instrument(s) or evaluation method involved. Therefore, the policy instrument or evaluation method involved will be used as the basis for determining which dimensions of policy arrangements need to be described in the empirical part of this thesis. This can be indicated as a bottom-up approach.

The analytical concept of administrative arrangements as introduced here can be regarded as an element of policy. As a consequence, the scheme presented in section 2.2.5 needs to be adapted to include these administrative arrangements. Figure 2.4 below shows the position of administrative arrangements relative to the elements of policy as identified in section 2.2.5.

Figure 2.4: the position of administrative arrangements relative to other elements of policy



2.5.2 RELATIONSHIPS BETWEEN THE DIMENSIONS OF A POLICY ARRANGEMENT AND ELEMENTS OF POLICY³¹

The role of economic tools and instruments in the policymaking process is part of strategic discourse: which tools and instruments can and should be used to evaluate policy alternatives and/or to effectuate the chosen policy? The use of economic methods for (*ex ante*) policy evaluation may even influence the strategic discourse about the choice for specific policy instruments. De Savornin Lohman (1994) argues that in turn, the choice for specific policy instruments influences the position of actors in the debate ('different policy instruments imply different policy arenas') (see also section 3.6). Applying economic policy instruments allows specific actors at the negotiation table and gives them a different position in the policymaking process than in the case of applying command-and-control instruments.

³¹ The discussion of the relationships between the dimensions of a policy arrangement and other elements of the analytical framework may relate to both policy arrangements and administrative arrangements. If the discussion of these relationships is specifically related to either one of these arrangements, this will be indicated in the text.

Institutionalisation of views and concepts (which are part of discourse, and thus of the substance-dimension of policy arrangements, see figure 2.3) takes place through policymaking and public governance (i.e. policy formulation and implementation). Institutions resulting from this process are elements of policy, including (the choice for) specific policy instruments and methods for policy evaluation. Since economic steering instruments and (especially) evaluation methods can play a role in decision-making in various steps in the process of policy formulation and implementation, the discourse about their role and content may take place at various levels in a complex 'web' of actors and their relationships. Stakeholders of a policy issue may therefore be involved in several partial discourses at the same time, or they may choose to focus on one specific partial discourse. It is also imaginable that at a certain moment, from a strategic point of view, (a coalition of) stakeholders shifts the focus of their attention from one partial discourse to another, for example if they think that they can make better use of their resources in that specific discourse arena. Besides using their resources for influencing the societal or political discourse (with the purpose of achieving discursive hegemony, for example by influencing public opinion through an awareness campaign), stakeholders may also try to change the outcome of the policymaking process by directing their power and resources towards changing the existing institutional setting (for example by filing law suits). Of course, a combination of strategies is also possible. The structure of the debate about the role of economic policy instruments and evaluation methods in policy arrangements is schematically represented by figure 2.5 below.

Figure 2.5: schematic representation of the dimensions of a policy arrangement and their mutual relationships, in the context of the policymaking process about the role of economic policy instruments and evaluation methods

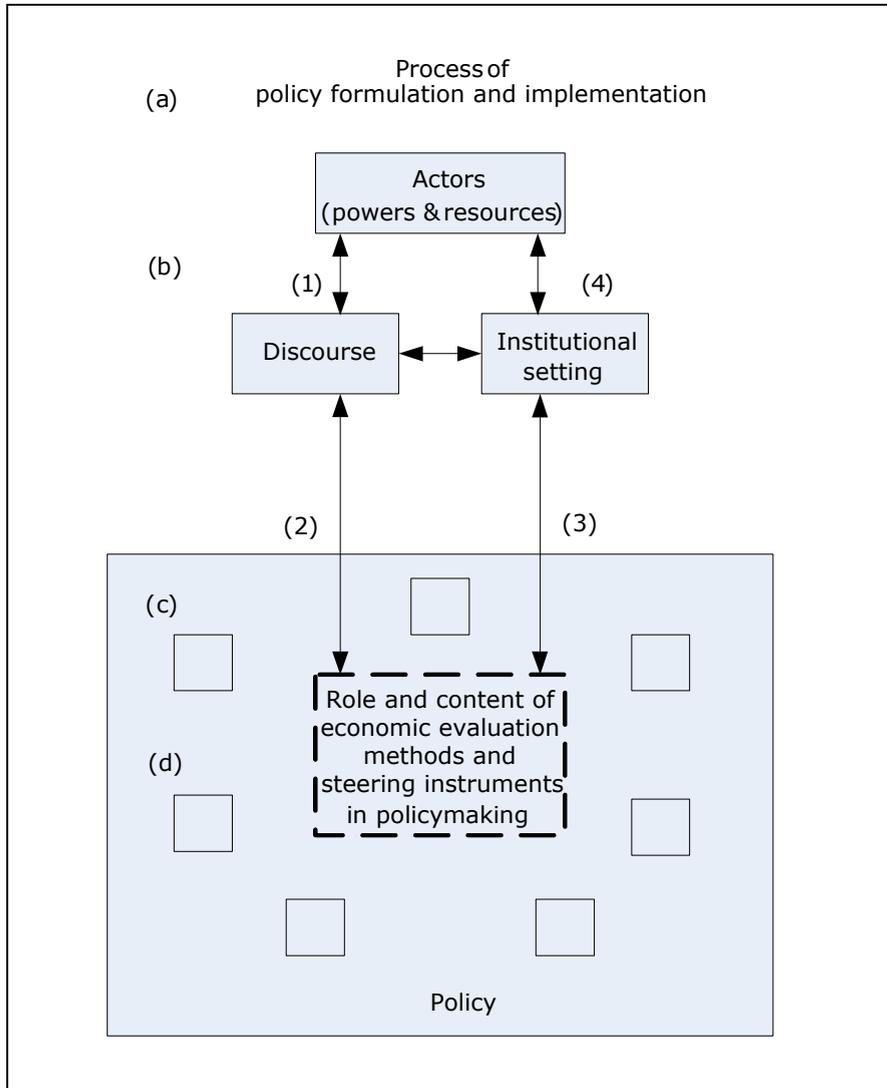


Figure 2.5 represents the core of the analytical framework of this thesis. Actors, power and resources, discourse and institutions ('rules of the game') are the four dimensions of policy arrangements as presented in figure 2.3. Whereas figure 2.3. and the guiding text do not provide much insight in processes, figure 2.5 does. This insight helps understand how various factors influence the outcome of policymaking. Figure 2.5 indicates the (combined) influence of the dimensions of policy arrangements on policymaking processes and their outcomes in terms of formulated policy and public governance. It is argued in this thesis that

other factors that may influence policymaking processes and their outcomes (such as trends in society) exert influence via these four dimensions of policy arrangements, and especially via the beliefs of single actors and the way these single actors interact with other actors in discourse. In turn, these actors may use resources to exert power on other actors, either or not in the discourse about the issue, by using resources available to them, including existing institutions. The outcome of policymaking processes, in terms of formulated policy and measures, are new institutions that, as soon as they are formulated and ratified, become part of the existing institutional framework for existing and future policy arrangements.

RELATIONSHIPS BETWEEN ELEMENTS OF THE SCHEME

Figure 2.5 requires some more explanation. In the figure, two main parts can be identified: the elements of policy (as described in subsection 2.2.1 and supplemented in subsection 2.2.4) and elements constituting the setting of the process to get to these elements of policy, represented by the dimensions of a policy arrangement (subsection 2.2.4 and further). The squares in the 'elements of policy'-dimension represent the various elements of policy, as mentioned in figure 2.2. The rectangular boxes in the figure represent (a) the policy arrangement as a whole³², (b) separate dimensions of the policy arrangement, (c) policy as a whole and (d) the separate elements of policy. The dashed box within the 'elements' box represents the position of economic policy instruments and evaluation methods as specific elements of policy. The arrows represent relationships between the elements of the scheme, which will be discussed in this subsection. As we will see from the discussion of these relationships, they mostly consist of mutual influence (hence the double arrows).

Before discussing other elements and relationships in the figure, it must be noted that a relationship exists between the content of economic policy tools and instruments and the role they play in policy. For simplicity reasons, this relationship is not represented by an arrow in the figure. The relationship goes both ways: on the one hand, actors in the policymaking process have specific interests they want to serve through the emphasis on or denial of the use of economic policy instruments or evaluation methods. Therefore, each actor (coalition) will try to let the economic instruments or methods play a role in the policymaking process that best serves their interests. A quite direct way to try to achieve this is to 'institutionalise' the role of the instrument or method in the process, i.e. to give it an official role (formal status). Another, more indirect, way is to influence the content (technical specifications) of the instrument, thus steering its effects or outcome (and as such its role). Specific outcomes (effects) of the instrument or method (i.e. its role), resulting from technical specifications (its content), may influence the acceptance of the tool or instrument by various stakeholders with diverging interests. As a reaction to this outcome, the actors involved may change the role the instrument or method plays in policy to better fit their interests.

³² Note that in this figure, the policy arrangement corresponds with the wider concept of policy arrangement, not with governance arrangements. The reason for this is that the actors making part of the governance arrangement can be, but not necessarily are, the ones who decided about the role and content of all the elements of policy as discussed before, including the governance arrangement itself.

Although several dimensions of the analytical framework were identified in this chapter, three are considered central: actors, discourses and institutions (or institutional arrangements). Actors influence the role of economic instruments and methods in policymaking through discourse and through institutional arrangements. Vice versa, the process and outcome of the policymaking process may influence the role actors play. All relationships between the elements of the figure can be said to consist of mutual influence, although the influence of one element on the other may be stronger than the other way around. The interaction between actors and discourse (arrow 1) is interpreted as follows: actors have specific interest with regard to a policy issue, and therefore will try to influence the policymaking process. One way to do this is through influencing the discourse about the issue. Actors can influence the discourse by introducing specific story lines in various types of discourse (the ontological, normative or strategic discourse). The latter includes story lines about the role and content of economic policy instruments and evaluation methods for policy regarding the issue. The most direct way to influence the role and content of policy instruments and evaluation methods is to get involved in the strategic discourse. However, the outcome of the ontological or normative discourse may influence the use of policy instruments and evaluation methods, even before the strategic discourse has started. Therefore, focusing on these discourses may be a good strategy to influence their use as well. Vice versa, the discourse regarding an issue may, as a net result of various (interacting) influences, evolve in a specific direction, thereby reinforcing (confirming) or changing the attitude or strategic position of actors with regard to that issue.

A similar line of reasoning is valid for the relationship between the discourse and the role (and content) of economic tools and instruments in the policymaking process (arrow 2). As was mentioned earlier, various pressures on the discourse, coming from several directions, may cause the discourse to evolve in a specific direction. As soon as a discourse evolves in a certain direction and holds a 'steady course' in that direction, the direction chosen can be referred to as the dominant discourse. Basing policy on this dominant discourse will lead to an institutionalisation (or 'objectification', 'legitimation') of this discourse and thus of the elements constituting the discourse (such as the underlying scientific and policy paradigms, the view on cause and magnitude of an issue, policy principles, concepts, goals and programmes and the role (economic) policy tools and instruments can and should play).

Just as discourses influence the choice of policy instruments, the choice of policy instruments can also influence discourse. For example, the discourse about economic tools and instruments in the policymaking process may focus the attention in the debate about a policy issue on specific parts of the discourse (in this case, the strategic discourse), therewith possibly precluding debate about other levels of discourse (the ontological or normative discourse or other strategic approaches). Focusing the debate on the application of policy instruments may lead the debate away from more fundamental questions, such as whether a policy issue is really a problem, or whether policy principles and goals should have been formulated the way they have. Besides, the implementation of economic policy instruments may also feed discourses not directly related to the issue, by giving an impulse to (i.e. reinforcing) trends in society such as 'scientification' and 'political modernisation' (for a discussion of the link between exogenous factors, such as long-term trends, and policy arrangements, see later this section). In this sense, economic policy tools and instruments, and the institutions regulating their application, can themselves be regarded as resources to

obtain and reinforce power in the policy arrangement. It must be noted that the influence of exogenous factors, such as trends in society, on the application of types of policy instruments can probably be more easily identified than the contribution of the application of specific types of policy instruments to these trends. This is the reason why trends in society and governance are regarded in this thesis as exogenous factors. The focus will be on the influence of these exogenous factors on the arrangement and not vice versa.

As was mentioned before, besides the direct interaction between the strategic discourse and the use of policy instruments or evaluation methods, these elements of the analytical framework may also influence each other in a more indirect way via other types of discourse or via other elements of policy. The dominant ontological and normative discourse may 'automatically' lead to the choice for certain policy instruments that support these discourses. Formulating policy goals in a quantitative way (normative discourse), for example, requires tools for policy evaluation that are able to quantitatively assess the effects of policy. And formulating policy goals in terms of the desired structure of a market leads to a demand for policy instruments and (other) institutions that can regulate this market³³. Note that in the latter example, 'the structure of a market' acts as a policy goal and not as a means to achieve another goal. This confirms the idea uttered earlier that it is important in the empirical analysis of policy processes in Dutch water management not to focus exclusively on the strategic discourse, but also on other discourses that may more indirectly influence the selection and content of policy instruments. The same counts for elements of the policymaking process.

The existing institutional framework (both formal and informal institutions) may act as a selection mechanism for the way the policymaking process takes place (arrow 3), especially with regard to the operationalisation of policy goals into policy implementation, but also 'earlier' in the process, for example in the phases of societal and political agenda setting. For example, assigning authority to a specific committee (the members of which may have specific views on how to deal with issues in water management), may select the issues addressed and the way to address them on forehand. Institutionalisation of (the role of economic instruments and methods in) policy through the process of policymaking and implementation, vice versa, may lead to a reinforcement of or change in the existing institutional framework. The existing institutional framework also influences the role actors play in the policymaking process (arrow 4). For example, laws and regulations prescribing a command-and-control approach to certain issues lead to a different arena (different (positions of) actors) than laws and regulations prescribing an economic policy approach. On the other hand, some actors have the power to change the institutional arrangement (either or not via policymaking and implementation) or to influence other actors that hold this power. In principle, only public authorities have the power to change formal institutions with regard to public policy. However, in practice, institutional developments in the market or in society as a whole may be (largely) out of control of public authorities, while these may in fact influence the institutional arrangement with regard to an issue as well. In that case, one can speak of the influence of an exogenous factor (political modernisation), which will be described later.

³³ See also the discussion of Russell, 2001 about imputed causes of policy issues and related strategies addressing these issues, earlier this chapter.

With respect to informal institutions, in principle, a broader range of actors can influence the process of institutionalisation than with respect to formal ones. In reality, however, the influence of these actors may be limited, depending on the already existing institutional setting and the balance between story lines in the discourse. Herewith, we have come to the last relationship in the figure, namely that between the discourse and the institutional framework. The balance in the discourse can influence the institutional framework in two ways: via the policymaking process, or in a more direct way. The policymaking process, which is influenced by the (dominant) discourse, may lead to a change in formal institutions, via the generation of 'policy institutions'. The influence of the balance in discourse on the institutional framework via de direct route (arrow 5) mainly relates to informal institutions. Dominance of a specific story line in the discourse can lead to (informal) rules about admittance or rejection of specific actors, paradigms, rules about the policymaking process and specific policy instruments. The direct relationship between institutional framework and discourse is mutual, in that the existing institutional framework may also influence the discourse. For example, actors may refer to the existing institutional framework regarding an issue in their story line, judging it to be suitable for their purpose. These judgments about the suitability (to use a common term for various criteria) of the existing institutional framework are based on both fundamental perspectives (such as belief systems and paradigms) and pragmatic/opportunistic considerations. Discourse can thus influence formal institutions in two ways, namely via changing informal institutions, and via the policymaking process.

The discussion of the relationships between the dimensions of the policy arrangement and elements of policy showed that actors can influence the outcome of policy in various ways. Routes to influence this outcome in a direct way usually require fewer resources, than routes to influence this outcome more indirectly. But the changes to the arrangement via this indirect influence are usually more fundamental in nature than changes via direct influence.

2.6 TWO MORE LEVELS OF ANALYSIS: INDIVIDUAL ACTORS AND EXOGENOUS FACTORS

2.6.1 INTRODUCTION

In the sections preceding this one, attention was paid to the separate dimensions of policy arrangements and their relations. One of those dimensions was that of actor(coalition)s. In the discussion of that dimension, however, no explicit attention was paid to what drives these actors to act. This question relates to the level of analysis of the individual actor. Actors are considered in this thesis to have a belief system, which acts as the basis for their decision-making and (thus) actions. It is thought that actors confront the present state of the world with their belief system in order to decide what they want and how they want to achieve it. As a consequence of this confrontation, actors have an interest in policy issues and have motives to take action within the framework of policy arrangements. In order to understand the actions (decisions) of actors in policy arrangements, it is therefore considered necessary to pay some more attention to this level of decision-making of the individual actor.

However, as was argued before, the actor involved in decision-making about a policy issue does not make his decisions in a vacuum. In the discussion of the analytical concept of policy arrangements and its dimensions, it was already argued that actors influence other actors and that there are several ways for an actor to do this. One such way (or strategy) is through discourse. This discourse may directly (and only) address the issue (and arrangement) at hand, but it is likely that other phenomena in the society and in politics are involved in this discourse as well. Some of those elements cannot be influenced by the actors involved in the decision-making process about a specific issue, other than by interpreting that element and presenting one's position with regard to the element in discourse. Because the actors involved in a policy issue cannot influence these elements, they are referred to in this thesis as exogenous factors. Besides influencing the decision-making process through discourse, these exogenous factors may also influence the process through the institutional framework and the resources available to actors involved. In terms of the concept of policy arrangements as represented by figure 2.3 these exogenous factors may thus be an element of both the aspect of 'substance' and of the aspect of 'organisation'.

Both the level of the individual actor and of exogenous factors are addressed to some degree by Van Tatenhove et al. (2000). However, these authors do not pay very explicit attention to the specific characteristics of these dimensions. Besides, the characteristics (or 'manifestations') of these levels they do address are considered incomplete or insufficient for the purpose of this thesis. Therefore, these levels are paid attention to in more detail in this section. It must be noted that the discussion of exogenous factors is made part of a wider discussion of various impulses for change. Section 2.7 will address the mutual relationships of the levels introduced here and their relationships with the level of policy arrangements as discussed previously.

2.6.2 CHARACTERISTICS OF INDIVIDUAL ACTORS

BELIEF SYSTEMS

In the introduction, it was already stated that actors are believed to have a belief system, which acts as the basis for their decision-making. Below, an account will be given of the different layers in a person's belief system. Belief systems are considered to be an important driving force for the behaviour of actors, and as such may co-determine those actors' interests, motives and strategies. Besides, the confrontation between different belief systems via discourse is interpreted in this thesis as giving rise to paradigms. Paradigms, so to speak, can be regarded as 'collective belief systems', and the expression of this collective belief in all kinds of formal and informal rules, habits and practices³⁴. In other words, they are 'institutionalised collective belief systems', fixed in both formal and informal institutions. It can be argued that paradigms, as a consequence, are detached from personal influences and

³⁴ It shows from this discussion that the concept of 'belief systems' itself is not confined to the level of individual actors. Belief systems can be shared between actors, for example between actors within an actor-coalition. However, in this thesis, 'belief systems' are used as an analytical concept mainly for the explanation of the behaviour of individual actors.

therefore operate as fairly autonomous entities or systems. This contrasts with belief systems, which can be ascribed to single actors or groups of actors.

Belief systems are explained as sets of basic values, causal assumptions and problem perceptions. With regard to belief systems of actors, Sabatier (1988, (et al.) 1993) distinguishes a range from principle to practical. According to Sabatier's theory, each individual and every coalition of actors in a policy network (or, in terms of Van Tatenhove et al. (2000), policy coalitions in a policy arrangement) has a value-system that exists of three layers: a deep normative core, a second layer (the 'near policy core') that forms the core of the position of actors towards policy and a third layer of secondary aspects. The deep normative core is believed to form the innermost core of someone's belief system, consisting of fundamental starting points and convictions. These norms reflect an individual's position in ontological discourses³⁵. These personal norms and values are relevant for and applicable to any (or at least most) situation(s), regardless of the policy domain or issue at hand. They are not or hardly subject to change. Examples of deeper lying values are conceptions about the desirable relationship between nature and mankind. These conceptions form the basis for policy paradigms regarding that relationship³⁶. The values of the deep normative core are of great importance for the way in which actors name problems in society (*naming*) and formulate policy for these problems (*framing*).

As was suggested above, the second layer forms the core of policymaking. This layer is about fundamental positions regarding strategies to realise the deepest normative values, related to specific policy issues or domains. These positions are not easily changed, but they may alter if actors realise that the values held lead to nowhere. Sabatier assumes that this will hardly ever happen if there is no clear pressure or motive from outside the subsystem. Examples of values from this 'near policy core' are: the preferable shape of democracy, the desired balance between public interventions and the market mechanism, conceptions about centralisation and decentralisation, the orientation towards substantial policy conflicts, for example between the environment and the economy, etcetera. This second layer of beliefs relates to the normative discourse in policymaking and shows close resemblance with trends in governance and political modernisation. The third layer (secondary aspects) consists of values relating to instrumental decisions and information required for realising deeper values. These 'values' are very specific and exclusively applicable to the policy issue at hand and are relatively easy to change. They are about the use of certain steering instruments, administrative measures, the participation in certain projects, information about the gravity of problems, et cetera. This layer of an actor's belief system is closely related to strategic discourse.

INTERESTS AND MOTIVES

Two other important characteristics of actors with regard to their position in policymaking processes are 'interests' and 'motives'. These terms are closely related. Interests of individual actors or actor coalitions in a policy issue may originate from a confrontation of that policy issue with fundamental aspects of their personal belief system. Basically, the

³⁵ See earlier this chapter.

³⁶ For a description of paradigms with regard to this relationship, see the next chapter or Colby (1990).

issue and the way the policymaking process regarding this issue takes shape may be in line with their belief system or may conflict with it. An interest may also originate from a more pragmatic consideration, such as the desired or present position of the actor in an arrangement and the benefits this actor personally (aims to) reap(s) from this position. In both cases, the interest comes forth from a confrontation of the actual or probable state with the state as desired by the actor. If an actor is neutral with regard to this confrontation, he does not have an interest in influencing the policymaking process, and can therefore not be regarded as a stakeholder (for he holds no stake).

Motives are related to interests since interests form the basis of motives. Contrary to interests, motives are associated with decisions to act or not to act. An actor can have an interest, but as long as he is not aware of this, or as long as he does not attach consequences to this interest, the interest is not 'transformed' into a motive. Motives are important characteristics of actors, since they are the drivers of an actor's actions. Motives may lead actors to take a certain position in discourses, to apply resources and exert power and to be in favour of or against the use of economic policy instruments or evaluation methods. An actor's motives are likely to be reflected in this actor's preference for certain selection criteria to judge and/or design (economic) policy instruments and evaluation methods and to have a specific opinion about the score of these policy instruments or methods with regard to these criteria. The combination of an actor's interests and the resources available to this actor in turn determine which strategy this actor chooses to further his interests.

2.6.3 IMPULSES FOR CHANGE (ENDOGENOUS AND EXOGENOUS FACTORS)

As was discussed earlier this chapter, some developments in society and some dimensions of policy arrangements reinforce existing policy arrangements, while others (try to) change it. Wiering and Immink (2003) ask themselves why policy arrangements change. They look for an answer to this question in the idea that institutionalisation, in line with the ideas of Giddens (1984), is an ongoing process in which the actions of actors and the functioning of structures influence each other continuously. Changes in the one will lead to changes in the other. Therefore, impulses for change can be found in this interaction between actors and structures. Wiering and Immink further specify this idea by distinguishing four important categories of impulses for change:

1. shock events: by physical, societal or political events that bring about a societal shock-effect, a sudden dynamics may emerge in institutional patterns;
2. changes from within: existing policy arrangements do not function properly anymore. For example, if the structure of rules and regulations in a policy domain has become increasingly complex ('piled-up institutions'), they appear to be less and less functional and coherent. The policy arrangement, as it were, topples over under its own weight. One starts looking for new patterns (f.e. deregulation, reorganisation, re-orientation, liberalisation, privatisation) to get out of this complexity;
3. changes as a result of the relation between policy domains, in which developments in one policy domain can influence the other;

4. changing policy arrangements as a consequence of long-term developments in society (either or not as a reaction to long-term developments in the physical environment). This includes especially changes in:
- The scale of living and policy;
 - Society itself;
 - Governance of society (political modernisation: changing relationships between state, market and society);
 - The relationship between humans and their physical environment (including changing paradigms on the human-nature relationship), for example as a consequence of physical developments such as the greenhouse effect.

One of the differences between the changes from within the policy domain as represented by categories 2 and 3 and developments in society as listed under impulse number 4 is that impulses 2 and 3 are specific for a specific policy domain or even a specific arrangement, while the impulses under 4 are general in nature. Impulses 2 and 3 can therefore be regarded as endogenous to policymaking in a specific domain or with regard to a specific issue (i.e. initiated by actors in political and/or administrative arenas), while impulses 1 and 4 can be regarded as exogenous to policymaking (i.e. they cannot be (directly) influenced by actors in the political and/or administrative arenas). Exogenous factors may act as impulses for endogenous changes. This will be explained further below.

In a model for policy analysis and design, Arts et al. (2001) present a number of steps, including the formulation of societal scenarios based on long-term trends. The long-term trends identified by Arts et al. can be seen as additional to and partly overlapping the ones identified above under impulse number 4. The long-term trends identified by Arts et al. are:

- *Political modernisation*: more room for market regulation and the private community for serving public interests;
- *Internationalisation*: increasing influence of international actors;
- *Scientification*: increasing dependence on experts and expert systems. Knowledge has become one of the most important political resources;
- *Ecological modernisation*: the emergence of ecological rationality within the market economy, which leads to technological innovations and a different positioning of producers and consumers with regard to ecological issues;
- *The emergence of post-material values*: as a consequence of welfare in western countries, the value pattern is supposed to have shifted from materialistic to post-materialistic values: well being, democracy and the environment are at the centre of attention.

Comparing Wiering and Immink with Arts et al., 'the scale of living and policy' as identified by the former is closely related to the trend of 'internationalisation' as identified by the latter. The development of 'society itself' as listed by the former can, in principle, relate to all trends mentioned by Arts et al.. The category 'society itself' is therefore not a very specific one. It can be made more specific if 'society' is equated with 'the societal arena', as opposed to the 'scientific arena', the 'political arena' and the 'administrative arena'. 'Governance of society' is closely related to the trend 'political modernisation', and 'the relationship between humans and their physical environment' shows close resemblance with the trends of 'scientification', 'ecological modernisation' and 'emergence of post-material values'.

Impulse number 4 as identified by Wiering and Immink (2003) and the long-term trends identified by Arts et al. are related to the other impulses in various ways. Impulses in category number (1), 'shock events', can be regarded as explosive manifestations of more slumbering, long-term processes as mentioned in category 4. These impulses are societal or natural phenomena that focus political attention on a specific issue. Impulse category number (2), 'changes from within', can be caused by one or more of the long-term trends mentioned above, especially one related to political modernisation. For example, under the pressure of the general trend towards more efficient public governance, it can be judged by the actors in a policy arrangement that the 'weight' of the old arrangement has become too heavy (it has become 'over-institutionalised') and therefore it does not function properly anymore (because it is not flexible, effective, and efficient)). As a consequence, it may be judged that changes will have to be made to keep legitimacy for policy. Impulse number (3), 'changes as a result of the relation between policy domains' can also be influenced by long-term developments in society and governance. For example, ecological modernisation may call for close co-operation between policy domains, and so may re-organisations resulting from a call for political modernisation.

2.7 RELATIONSHIPS BETWEEN DIMENSIONS OF THE POLICY ARRANGEMENT, INDIVIDUAL ACTORS AND EXOGENOUS FACTORS

INTRODUCTION

From the discussion of the legitimisation for the new levels of analysis in the introduction of the previous section, it becomes clear that the analytical model for this thesis distinguishes three levels of analysis. The first level is the decision-making process of individual actors. This level involves the belief systems, interests and (thus) motives of individual actors and the selection criteria they use for the choice of policy instruments based on these beliefs, motives and interests. The first level of analysis is part of the actor dimension of a policy arrangement, but relates to individual actors instead of the interaction between (coalitions of) actors. The second level addresses the interaction between actors involved in the policymaking process and structural characteristics of this process. This level of analysis is represented by the concept of policy arrangements. It deals with the way individual actors or groups of actors communicate their interests, motives, demands, goals and criteria to other actors involved. In this process, the elements of policy as identified earlier in this chapter act as formal (principles, goals, instruments) or informal (paradigms) institutions and as elements of discourse. The third level relates to developments (trends) in society that influence water management as a whole or specific policy arrangements in it. These developments do not specifically relate to water management, but they may nevertheless influence elements of water management, such as its organisation and policy. They are referred to in this thesis as exogenous factors, since they cannot be (directly) influenced by the actors involved in policymaking processes in Dutch water management.

This section will discuss the relationships between the dimensions of a policy arrangement, elements of policy, the characteristics of individual actors and exogenous factors (trends in

nature and society). By doing so, the scope of the analytical framework will be expanded, while keeping in mind that policy arrangements involving economic policy instruments, as discussed in the previous subsection, are the central object of analysis. The discussion of relationships between elements of the analytical framework will start with the relationship between the two levels of analysis introduced in the previous section. Then, the relationships of each of these levels with the level of policy arrangements will be discussed. Finally, this results in a coherent discussion of the relationship between all levels of analysis.

RELATIONSHIPS BETWEEN INDIVIDUAL ACTORS AND EXOGENOUS FACTORS

Since exogenous factors cannot, or only to a very limited extent, be influenced by individual actors, it is assumed in this thesis that the relationship between these factors and individual actors goes one way. This relationship will be explained from the perspective of (societal) trends. Since shock events are regarded as sudden manifestations of these trends, the mechanism is considered to be similar. When viewing the relationship in a simplistic, stereotypical manner, an individual actor may be expected to either support or reject a trend. However, in reality, the actor's position may not be as black and white. Firstly, an actor may regard a trend as desirable with regard to one policy issue, while rejecting it with regard to another. Secondly, a trend may be regarded as a means to achieve other goals or as a goal in itself. The position of an actor towards a trend may thus depend on the situation at hand and may be fundamental or pragmatic in nature. Besides, this position may change over time, influenced by circumstances. An example of a changing position of one actor group towards a trend that is relevant for this thesis is the position of environmental NGOs towards economisation. In the early years of this trend, most NGOs fiercely opposed to the trend all together, argued from the belief that economic analysis can never incorporate all effects of human activities. However, as the trend became stronger and more pervasive, and their radical position towards economisation pushed this category of actors to the sideline of decision-making in policy, they were forced to adopt a different position towards economisation, which can be typified as 'economisation under specific conditions'. Instead of blocking the use of economic evaluation methods all together, they shifted to trying to influence the content and role of the instruments by stipulating the specific conditions under and specific purposes for which they could be used³⁷.

RELATIONSHIPS BETWEEN INDIVIDUAL ACTORS AND (OTHER) DIMENSIONS OF THE POLICY ARRANGEMENT

As was described before, the individual actor is presumed to hold a belief system, with a deep normative core, a near policy core and a layer related to secondary aspects. All these layers may influence a person's ideas about the severity of a policy issue, the desired state with regard to this issue, the desired policy, the selection criteria that are important for the choice of policy instruments, and (thus) the desired policy instruments to be used. As soon as this individual communicates with other actors about his ideas with regard to these elements of policymaking, he enters the discourse related to this issue. Discourse can be regarded as the dominant way in which actors can influence the policy arrangement (and

³⁷ For an elaborate discussion of this mechanism, see Schuijt (2003).

thus the outcome of policymaking). The relationship between actors and discourse was already addressed in the discussion of relationships between dimensions of policy arrangements. The layers in an individual's belief system and the types of discourse are related in the sense that these layers and types correspond with regard to the steps in decision-making they address. This is explained below, in the discussion of the parallels and relationships between belief systems, paradigms, policy principles and discourses. The selection criteria held by an actor for policy instruments may relate to each of these levels and may thus be either fundamental or pragmatic in nature. As was mentioned before, another way to influence the outcome of policy making is by directing power and resources at changing the institutional framework or at manipulating other actors in other ways than via discourse. It is, however, presumed in this thesis that these routes play a minor role compared to the route via discourse.

Relationship between belief systems, paradigms, policy principles and discourses

From the discussion of belief systems, paradigms, policy principles and discourses in this chapter so far, the impression rises that there are close relationships and parallels between these concepts. These will be addressed here, together with a characterisation of their differences. It can be stated that belief systems and paradigms in general surmount the level of single policy domains and issues, and may even surmount policymaking itself. They may apply to any activity in society, be it in the economic, scientific, political or social arena. The same counts for the translation of these paradigms into policy principles and the articulation of these paradigms through discourse. Therefore, these concepts need to be filled in (made concrete) for the subject of this thesis (see chapter 3). It can be argued that paradigms are an important constituting element of story lines. Belief systems, being at the core of what actors (groups or individuals) think, were identified as important motives for actors to take a specific position in a policy discourse (or so to say, to come up with a specific story line). Paradigms, acting as (informally) institutionalised representations of shared belief systems, may act as important points of reference in these discourses. They make it possible for individuals or groups to express their position towards an issue in language by referring to common (shared) interpretations, positions, thoughts and activities, as represented by a specific paradigm. Policy paradigms, in turn, are translations of someone's general belief system into a basic position regarding the way to address specific policy issues. Policy principles act as a next step in the operationalisation of fundamental beliefs into policy. These policy principles come forth from the dominant discourse regarding a specific policy issue or domain. This dominant discourse can either be the discourse of one very dominant policy coalition or a compromise between discourses of various more equal policy coalitions.

Each of the analytical concepts discussed here can be said to consist of layers, ranging from fundamental to more practical. Roughly speaking, the layers of each of these concepts correspond with the same layer of the other concepts. It must be noted, however, that the different layers of the concepts addressed do not fit one on one. For example, having a 'deep normative core' is not exclusively reserved for actors in the scientific arena. Although science does play an important role in shaping this 'deep normative core', other types of institutions can also influence this layer, such as for example religion, or strong role models in an individual's vicinity. Table 2.1. below gives an impression of the relationships between the analytical concepts discussed above.

Table 2.1: comparison of the concepts of belief systems, paradigms, principles and discourses, and their dimensions

Analytical concept Description of dimension	Belief system of Sabatier	Paradigm	Principle	Discourse
Most fundamental, not related to policy domain or issue. Relates to the way in which to interpret phenomena (what is the state of the world? How analyse it?)	Deep normative core	Scientific paradigms (fundamental belief about how to analyse the world)	Fundamental principles, applicable in any situation	Ontological discourse
Regarding the way to address/deal with phenomena (what is the desired state of the world? How to achieve it?)	Near policy core	Policy paradigms (fundamental belief about the desired state of the world)	(Normative) Policy principles, applicable to policy domain or issue	Normative discourse
Regarding the tools to use for addressing phenomena (what tools can be used to achieve the desired state?)	Secondary aspects	Policy paradigms	Strategic policy principle, applicable to choice of instruments and methods	Strategic discourse

RELATIONSHIPS BETWEEN EXOGENOUS FACTORS AND (DIMENSIONS OF) POLICY ARRANGEMENTS

Relationships between exogenous factors, actors and discourse

In this passage, the attention will be directed at the relationship between exogenous factors and (individual dimensions of) the policy arrangement. The exogenous factors identified earlier can be divided into natural and societal trends. Whereas societal trends may be purposefully initiated by specific actors (via discourse), natural trends will not (or hardly so). However, both natural and societal trends can either be neglected and mitigated or emphasised and reinforced via discourse. As such, discourse is an important dimension determining the impact of trends on policy arrangements. This will be explained in more detail below.

It can be said that some long-term trends are pathways towards paradigms (in the meaning of desirable (end) states of the world), while other pathways lead society away from this desired end state and are (thus) considered undesirable. Both types of trends may influence discourses in policy arrangements. Each actor may support or reject a trend for a specific reason and refer to this trend in the discourse about specific aspects of policymaking. For example, a policy analyst may support political modernisation from the perspective of expected increased efficiency in policymaking, an entrepreneur because of expected increase in room to manoeuvre or more power, and a civil servant may object because of expected decrease in power. Because of these different motives for supporting or rejecting a long-term trend, actors may also 'fill in' certain trends in different ways. In other words, they may create different story lines about the trends, according to their interests and beliefs, thus giving a different meaning to these trends and their effects. The dominant 'shape' of the

trend will be the result of the discourse about this trend and the discursive hegemony of one (or a combination) of the story lines. According to the same way of reasoning, actors may favour certain trends over others. Actors that favour the same trend or the same interpretation of a trend (not necessarily for the same reasons) may form actor coalitions to be better able to influence the discourse about these trends.

Relationships between exogenous factors and (elements of) policy

Exogenous factors were divided earlier into natural and societal trends. Whereas natural trends may influence any element of policy, both fundamental and more concrete, generally speaking, long-term societal trends influence elements of policy that are fundamental and general in nature, such as paradigms, principles and concepts. Since long-term societal trends can be seen as pathways towards paradigms, supporting specific trends reconfirms certain paradigms and may marginalize others. Since these trends may influence the balance between various paradigms, they may also influence the balance between various types of policy principles as the first step in the operationalisation of these paradigms. Policy principles may be formulated by directly referring to the desired state of the world (the paradigm) or by referring to the pathway to it, being the societal trend (presuming these trends are consciously created as pathways towards paradigms). Of course, through paradigms and principles, other aspects of the policymaking process can be influenced by long-term societal trends as well. 'Lower', more practical and issue related aspects of the policymaking process, such as the choice and content of policy instruments, might even be legitimised by directly referring to societal trends. This is likely to be the case when these trends are regarded as a goal per se, instead of a means towards a goal. Thus, the support for a societal trend through the use of, for example, specific types of policy instruments may be motivated from either a fundamental or pragmatic perspective. This contrasts with the support for paradigms, which will in general be motivated from a fundamental, ideological perspective only.

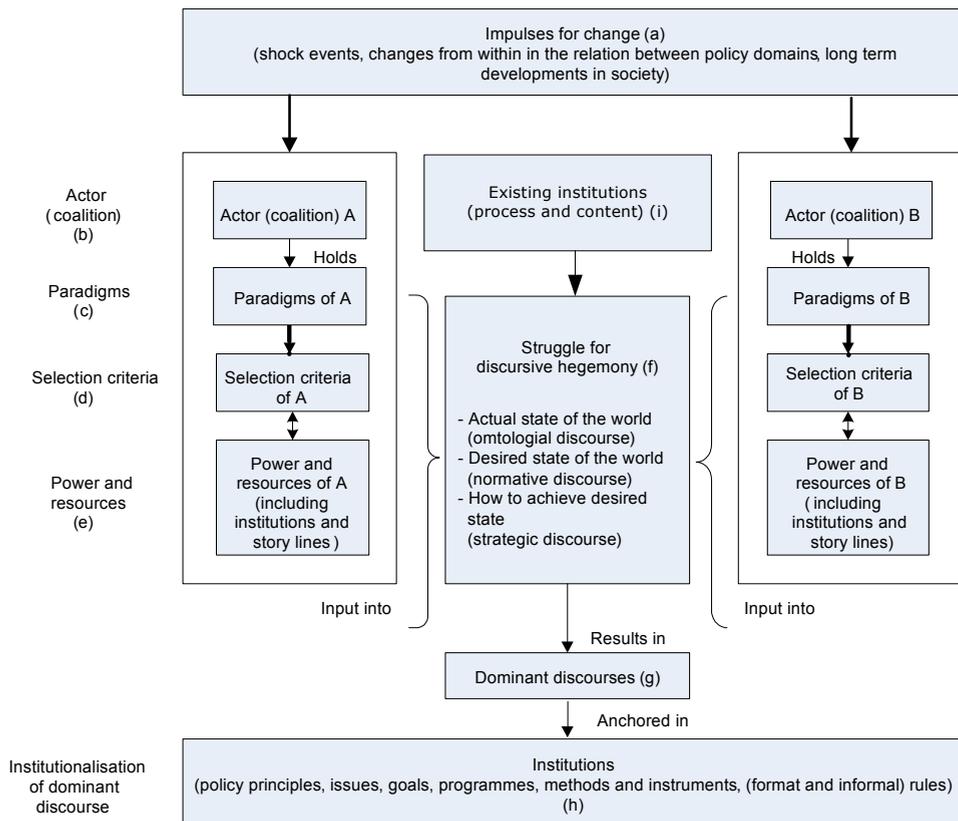
RELATIONSHIPS BETWEEN EXOGENOUS FACTORS, INDIVIDUAL ACTORS AND (DIMENSIONS OF) POLICY ARRANGEMENTS

The introduction of the level of individual actors (the first level of analysis) and of exogenous factors (the third level of analysis) and their relationships to the level of policy arrangements leads to an adaptation of the analytical framework. The combination of the three levels of analysis and their interactions into one model yields figure 2.6 below. As was discussed before, policymaking processes are not linear in nature. However, for the sake of simplicity it is presented as such in the figure. The impulses for change that influence the composition of policy arrangements and therefore the outcome of the policymaking process (including the choice and content of economic policy instruments) are listed in and represented by the box 'impulses for change' (a). These impulses may be both exogenous and endogenous in nature. The characteristics of individual actors (belief systems, interest, motives) are represented by elements (b), (c), (d) and (e). As soon as these actors enter discourse (f), the process engages into the second level of analysis (that of policy arrangements). The processes of struggle for discursive hegemony (f), resulting in dominant discourses (g) and the anchoring of these dominant discourses in new institutions (h) are guided by existing

(process) institutions (i). The new institutions constitute the content of policy and may in turn act as process institutions for new policymaking processes.

Figure 2.6 will serve as a tool for identifying relevant elements in the context of policymaking about (economic) policy instruments and evaluation methods in water management in the empirical part of this thesis.

Figure 2.6: schematic representation of the interaction between elements of the analytical framework in various levels of analysis



2.8 SUMMARY

In this chapter, an analytical framework was developed that forms the basis for the analysis of factors influencing the application of economic steering instruments and evaluation methods in Dutch water management. Existing analytical and theoretical concepts and models for policy analysis were considered insufficiently comprehensive or specific for the purpose of this thesis. Therefore, these concepts and models were recombined to form one comprehensive framework. The analytical framework of this thesis consists of three levels of analysis, being the level of individual actors, the level of interaction between actors and

structures in the context of policy issues in water management, as covered by the analytical concept of policy arrangements, and the level of impulses for change that operate outside the sphere of influence of these policy arrangements and that are therefore referred to as exogenous factors. The fact that the analytical framework consists of three levels of analysis and their interactions in principle enables the comprehensive analysis of the factors as mentioned above. In the next chapter, it will be argued that the comprehensive analysis of policy issues is a precondition for integrated water management. Besides, a comprehensive framework enables describing different types of policy arrangements involving different types of policy instruments and evaluation methods by one framework, which in turn enables the comparison of these arrangements. In the next chapter, the elements of the analytical framework as presented in this chapter will be made operational (i.e. filled in) for the subject of this thesis. At the end of the next chapter, it will be explained how these elements of the analytical framework and their relationships will be identified in the practice of Dutch water management. The characters in figure 2.6 will act as a reference in that respect.

3

CHAPTER 3 ANALYSING THE APPLICATION OF ECONOMIC POLICY APPROACHES IN INTEGRATED WATER MANAGEMENT

3.1 INTRODUCTION

The purpose of this chapter is twofold. Firstly, it addresses the theoretical applicability of economic policy instruments and evaluation methods in integrated water management and their hypothetical contribution to integrated water management, based on various theoretical insights. Secondly, it discusses the way in which the role of economic instruments and evaluation methods in Dutch water management will be analysed in the empirical chapter in order to be able to compare this role in reality to the theoretical applicability as discussed in this chapter. For this purpose, the analytical framework as introduced and discussed in the previous chapter will be made operational by filling in its elements and relationships for the subject of this thesis.

The chapter will start in the next section with a discussion of the emergence and central characteristics of the concept of integrated water management. Then, starting in section 3.3, theory about economic (policy) approaches to societal and political issues will be discussed. This part starts with a description of economic theory about the analysis and management of phenomena and activities in society. The purpose of this description is the identification of basic (theoretical) starting points and assumptions of economic approaches to societal issues. Next, the rationale for government intervention in markets and for the use of economic policy instruments and evaluation methods will be discussed. By comparing the characteristics of integrated water management as described in section 3.2, rationales for government intervention in markets and the characteristics of economic policy approaches, a description can be given of the type of economic policy approaches that can in theory be applied to (certain issues or aspects of) integrated water management, the role these instruments can play and the pre-conditions these instruments have to meet in order to contribute to an integrated approach to water management (section 3.4). Next, the main categories of relevant economic policy instruments and evaluation methods will be described (section 3.5). Generally speaking, market based policy instruments provide for institutional settings that should improve the incorporation of public interests in market transactions. The incorporation of public interests can also be regarded as the main issue with regard to the economic evaluation of projects and policy. The discussion of economic policy instruments

and evaluation methods will be related to the conditions under which these instruments may be applied in water management and the conditions under which they contribute to integrated water management. Section 3.6 will discuss a number of issues (i.e. objects of debate) related to the selection of (economic) policy instruments and evaluation methods. This discussion will generate insight into possible motives of various types of actors for taking a specific position with regard to the content and role of economic policy instruments and evaluation methods in Dutch water management. For each of these sections, it will be indicated how its content relates to the analytical framework as developed in the previous chapter.

Then, towards the end of the chapter, the analytical framework will be made operational for the empirical analysis of the application of economic policy tools and instruments in Dutch water management. This involves the characterisation of the elements of the framework and the relationships between these elements for specific (stereotypical) types of arrangements in water management involving economic policy instruments and evaluation methods. Based on this characterisation and on the preceding theoretical insights, a selection will be made of the characteristics and categories of elements of the analytical framework that are considered to be of (potential) influence on the choice of economic policy tools and instruments in Dutch water management. This selection will act as a framework of reference for identifying the relevant elements of policy arrangements in the empirical chapters. Following this, it will be discussed how these elements of the analytical framework will be identified and analysed in the empirical chapters.

Many theoretical and analytical concepts in this chapter are derived from theories about environmental policymaking. Often, the term 'environmental' is left standing in the text. The reason for this is that in that case, the concepts, mechanisms, developments and the like described in theory about environmental policymaking are considered relevant for integrated water management as well. As was argued before, integrated water management can, to a large extent, be perceived as 'sustainable water management'. It will be argued in the next section that a major underrepresented interest in sectoral water management was that of the environment. The incorporation of environmental aspects in all kinds of decision-making processes is also an important aspect of (the ecological dimensions of) sustainable development. Environmental policymaking and integrated water management therefore show a large degree of overlap with regard to philosophy about environmental and ecological aspects of policy and management³⁸. In some respects, however, water policy and environmental policy differ as well. Many aspects of water policy and management are not (directly) related to or motivated by environmental concerns, and, therefore, many aspects of water policy and management are performed by different organisations than those established for environmental policy and management. It can be argued that this is especially the case for water quantity management. Therefore, in some cases, an explicit distinction will be made in this chapter (and in the thesis as a whole) between environmental policy and management on the one hand and water policy and management on the other.

³⁸ Note that the same can be argued for the social and economic dimension of sustainable development and integrated water management. It was however chosen in this thesis to focus on the ecological dimension. Therefore, the social and economic dimension will (only) be addressed from the perspective of their relationship with the ecological dimension.

3.2 DISCOURSE ABOUT INTEGRATED WATER MANAGEMENT

3.2.1 INTRODUCTION

In order to be able to discuss the applicability and utility of economic policy instruments in integrated water management, the characteristics of both economic policy instruments and evaluation methods and the concept of integrated water management have to be explored. This section will address the concept of integrated water management. Integrated water management is a general policy concept for water management with a normative character. It describes the way in which water management should be shaped in order to achieve the desired end state with regard to the appearance and functioning of water systems. Concepts are often based on fundamental, ideological points of view and can be seen as elaborations of these points of view, either or not via other elements of policy, such as policy principles, depending on the level of abstraction of the concept. Policy concepts can be regarded as a way to make these fundamental points of view operational for a specific policy domain or issue.

As we will see in this section, the concept of 'integrated water management' was introduced in the middle of the 1980s. Since the concept was introduced in water management relatively recently, it has not been institutionalised (fully) yet (see below for a description of the concept of institutionalisation). Therefore, discourse about the meaning and operationalisation of the concept is still going on. In this discourse, various actor-coalitions that have specific stakes in water management may have an interest in different interpretations and operationalisations of the concept. What specific story lines about (integrated) water management look like depends on the interpretation of the concept by the actors presenting these story lines. The description of integrated water management in this section will be based on the debate about the meaning of this concept and the way it should be made operational in the daily practice of water management³⁹. Part of the operationalisation of this overarching concept is the formulation of underlying concepts and principles that can be seen as a first step towards making the concept concrete. After having formulated policy principles and concepts for integrated water management, the next step in the operationalisation of the concept is the translation of principles and concepts into policy goals, programmes and instruments. Therefore, the first step of translating the overarching concept into underlying concepts and policy principles may have a strong influence on the choice of policy instruments and evaluation methods.

From the discussion of the dominant discourse about integrated water management, key characteristics of the concept will be distilled. These key characteristics can be regarded as pre-conditions for policy approaches (steering instruments and evaluation methods) in order to fit the concept of integrated water management. In order to understand the concept of

³⁹ The discussion in this section of the discourse about the way the concept should be made operational relates to a generic level. This generic level addresses the translation of the concept into other, more practical concepts and into other generic elements of policy, such as policy principles. The discourse about the (more detailed and concrete) 'operationalisation' of the concept into economic policy instruments and evaluation methods will be addressed later this chapter.

integrated water management, it must be clear in what way it differs from the approach to water management preceding it. Therefore, this section will start with the description of traditional policy arrangements in sectoral Dutch water management and changes in governance leading to the introduction of the concept of integrated water management. In terms of the analytical framework, the concept 'integrated water management' is a constituting element of story lines about water management, and as such an element of discourse. Story lines and discourse correspond with elements (e) and (f) in figure 2.6.

3.2.2 CHANGES IN GOVERNANCE

A BRIEF REVIEW OF TRADITIONAL ARRANGEMENTS AND THE HERALDING OF AN INTEGRATED APPROACH

The struggle against water is inextricably connected to the history of the Netherlands. Without dykes and polders, present-day The Netherlands would not exist. Controlling and managing water has not only shaped a large part of the Dutch landscape, but has also led to the institutionalisation of water management organisations. The water boards, erected in the Middle Ages, are nowadays still responsible for the quantitative and qualitative aspects of water management at the regional level (Janssens and Van Tatenhove, 2000: 152). Until the 1960s, water management in The Netherlands was dominated by quantitative aspects, such as flood prevention (Jong, 1987). Safety for the population and water management for food production were the primary points of attention, which resulted in major technical projects, such as the construction of flood defence structures and land reclamation. As a consequence of the economic growth in the period after the second world war and the emergence of attention for the environment resulting from increasing concern about the growing pollution resulting from this (unbridled) economic growth, qualitative aspects, such as water pollution, received increasing attention. In the first national white paper on water management (*Eerste Nota Waterhuishouding*) of 1968, three central themes were identified (Ministerie van Verkeer en Waterstaat, 1968): water protection, public water supply and agriculture. In this policy paper, that manifested concern about the negative effects of economic and demographic growth, several changes in policy were proposed. One of those changes was the replacement of inadequate legislation, which was largely restricted to water quantity management (Janssens and Van Tatenhove, 2000: 152). As such, this white paper marked the start of the institutionalisation of water quality management.

In 1984, the ministry of Transport, Public Works and Water management (*Ministerie van Verkeer en Waterstaat*) published another report, titled *Water Organisatie* ('water organisation'). Attention was paid in this document to integrated policy by stressing the need for a coherent policy for and management of surface water and ground water (which was referred to as 'functional coherence') (Wisserhof and Crijns, 1992). Although this document (thus) acknowledged the need for integrated water management (although not in those exact words, since the term had not been introduced yet), because of the interdepartmental division of tasks and competencies, it concentrated on water quantity management. Till the 1960s, the institutionalisation of water management was strongly influenced by the

characteristics of early political modernisation⁴⁰. Both the policy resolutions and the policy concepts in the period preceding 1960 can be interpreted as discourses, rules and means defined by the state, meant to steer societal and political developments (see for example Janssens and Van Tatenhove, 2000: 153). One of the central characteristics of water management before the mid '80s is that policy was (almost) exclusively motivated from an anthropocentric perspective.

GENERAL DISCOURSE ABOUT INTEGRATION AND GOVERNANCE

By the end of the 1970s, the shortcomings of the traditional state arrangements surfaced. These problems related to the implementation deficit (*handhavingstekort*), partly caused by the completely state controlled planning system and partly by the fragmentation of policy as a consequence of a lack of co-ordination and co-operation between various policy domains (Janssens and Van Tatenhove, 2000: 154). In order to annihilate these shortcomings caused by the fragmentation of policy, attempts were made to enhance the co-ordination between the policy domains of spatial planning, environmental policy and water management. The implementation of this rather technical discourse in policy arrangements was influenced by the discourse on governance. During the 1980s, the relation between state, society and market changed fundamentally. As a consequence of macro-processes, such as the economic crisis at the end of the 1970s and processes of globalisation in the '80s and '90s, the idea that the state could 'design' societal developments gradually disappeared. Besides external causes, there was also an internal incentive for changing the state's planning arrangements and the state-dominated ways of governance⁴¹. The implementation deficit and the insecurities about and unseen consequences of 'design planning' made clear that effective governance required more than regulating and planning by the state alone. In order to improve the implementation of plans and policy, interactions with and new ways of co-steering by society and the market were investigated (Janssens and Van Tatenhove, 2000: 155).

The broadening of policy coalitions

In chapter 2 it was stated that two views exist on the formation of policy coalitions: the strategic view and the institutional view. In this passage, the institutional view will be addressed in more detail, with regard to arrangements in Dutch water management. In this institutional view, changes in policy coalitions are the result of structural changes in governance. In the phase of early political modernisation⁴², coalitions were likely to be formed within the nation state model or, at the international level, as inter-governmental coalitions between nation states. This way, early modernisation gave rise to more or less closed policy-making processes, dominated by small coalitions of state agents interacting with a small number of functional interest organisations. This situation applied to sectoral water management. Due to alternative ideas on governance and politics, resulting from the

⁴⁰ For a discussion of phases of political modernisation, I refer to Van Tatenhove et al., 2000: 35 a.f.

⁴¹ Note that these developments can be identified in terms of a number of the impulses for change (both external and internal) as identified in the previous chapter. Therefore, they correspond with element (a) of figure 2.6.

⁴² For a discussion of phases of political modernisation, I refer to Van Tatenhove et al. (2000).

emergence of the anti-modernist wave of the 1970s, the coalitions broadened as various agents from both market and civil society gained access to policymaking and implementation. This broadening process became to some extent institutionalised in advisory and participation procedures, such as petitions, lawsuits and impact assessments. This development enabled the formation of new policy-coalitions both at the national and the international level. The late political modernisation phase has 'created' coalitions that cross the traditional divides and boundaries of the nation state model (Van Tatenhove et al., 2000: 58). All in all, the process of political modernisation is expressed through the involvement of increasing numbers of private and public actors in national and international politics, thereby inducing the broadening of policy coalitions.

According to Arts (1990), the broadening of coalitions takes place in two directions, as both horizontal interrelations (at one political level) and vertical interrelations (between different levels) have grown. It can even be argued that a third dimension has emerged, namely the diagonal one. Diagonal integration points to co-ordination procedures that cut through existing statutory systems, in order to establish close co-operation between departments, different layers of government and, if necessary, private partners in planning and realising complex and urgent strategic projects (Janssens and Van Tatenhove, 2000: 156). This dimension involves specific, often temporary, arrangements that differ from standard ones in horizontal or vertical interrelations. As such, these arrangements constitute a new type of institutional arrangement. Diagonal integration can be triggered by what Wiering and Immink (2003) call 'shock events' (see chapter 2). These shock events legitimise bypassing standard procedures and introducing specific institutions for the execution of the project. An example of such an arrangement is the organisation for the process of adapting the major river system in The Netherlands to an expected increased discharge in winter times. This arrangement will be addressed in detail in chapter 5.

The influence of changes in governance on power positions and relations

Looking at the different stages of political modernisation, structures of domination change as a result of the changing relationships between state, market and civil society. This can be explained by comparing two different types of arrangements. In the early and anti-modernisation stages, the state was the predominant 'power container'. In these stages, *corporatist arrangements* were dominant. These arrangements can be characterised by a typical institutional form of exchange relations between the state and (a small number of) interest groups, to whom a formal representative status is granted in policy formulation, decision-making and implementation. In these arrangements, such interest groups are acknowledged as intermediate organisations, which implies a certain control over political resources, such as some degree of formal authority. More specifically, the state provides information, entrance, influence, status and a quasi-monopoly to the interest groups, while the interest groups provide expertise, co-operation, discipline and legitimisation (Frouws, 1993: 43). This allocation of power to a large extent determines the capabilities of these actors (and those not involved), and thereby pre-determines the political outcome of this type of arrangements (Van Tatenhove et al., 2000: 60). In other types of arrangements the allocation of authoritative resources, and therefore the division of political power, is different, leading to other kinds of resource dependencies (Lieverink, 1995). In the stage of late modernisation, *liberal arrangements* became more dominant. In these arrangements state authorities depend on those who control resources they do not have themselves for realising

their goals. For example, the need for economic expertise and investment capital makes state agencies dependent on companies, private consultants, banks, etcetera, while in some cases, NGOs such as Amnesty International or Greenpeace provide the necessary legitimacy (Willems, 1982). It goes without saying that in such cases of mutual resource interdependency power is more diffuse and more evenly distributed. It will be demonstrated in the empirical part of this thesis that various types of arrangements involving different types of economic instruments can be characterised according to the categories as discussed above.

NEW ARRANGEMENTS IN WATER MANAGEMENT

Van Tatenhove et al. (2000) analysed for each of the policy domains of water, environment and spatial planning in which way the discourse about governance influences the statist arrangements⁴³. During the 1980s each of these policy domains has given its own interpretation to integration, depending on its planning system and level of internal institutionalisation. Here, we limit ourselves to the analysis of the domain of water management. The present planning system in Dutch water management is based on the Water management act (*Wet op de Waterhuishouding*) dating from 1989. The legal and planning system following from the Water management act proved to offer insufficient means for realising horizontal and vertical co-ordination. Besides, during the 1980s and '90s, emphasis in water management shifted from internal towards external integration. These changes were reflected in new planning concepts such as 'integrated water management' and the 'water systems approach'.

In these planning concepts, the management of water systems became the joint responsibility of a diversity of actors, and new coalitions in water management emerged (see Van der Vlist, 1998; Havekes, 1990). The third and fourth white papers on water management (*NW3* and *NW4*) describe integrated water systems management, based on the water systems approach, as 'coherent water management (policy and management) by different administrative levels with strategic water management tasks'. In these resolutions, especially increased coherence between policy for land use, environment and water management (horizontal integration) was deemed necessary to realise policy goals. At present, water is not only (at least formally) regarded as a structuring principle for spatial planning, but also as one of the frameworks for the integration of various policy domains. An expression of these changes is the region-oriented policy approach (Janssens and Van Tatenhove, 2000: 165). Examples of the application of this approach to water management will be discussed in chapter 5.

The question related to the broadening of policy coalitions as described above is whether this process has led to a structural redistribution of resources and therefore a change in relations of autonomy and dependency between actors involved in policy arrangements in Dutch water management. A second, related question in this respect is whether or not this possible

⁴³ By simplifying somewhat, statist arrangements can be interpreted as the way public governance is organized at the level of the nation state, involving amongst others the division of tasks between public and private actors and the types of actors involved in policymaking.

redistribution has consequences for the use of economic policy instruments in water management.

3.2.3 INTEGRATED WATER MANAGEMENT

INTRODUCTION AND INSTITUTIONALISATION OF THE CONCEPT

The goal of water policy as formulated in the fourth white paper on water management (*NW4*) is 'having and keeping a safe and liveable country and maintaining and re-enforcing healthy and sustainable water systems' (Ministerie van Verkeer en Waterstaat, 1998: 11). The first part of this goal has existed for centuries, although with diverging views on what the notions 'safe' and 'liveable' entailed. The second part is of more recent date. Policies for both parts at first were worked out as separate tracks. In the 1980s, the notion emerged that the goals of safety and liveability could not be addressed separately, argued from an approach aiming at healthy and sustainable 'live-systems'. Besides, it was acknowledged that parts of water systems that previously had been addressed separately, such as ground water and surface water management, should be addressed in a joint manner (internal functional coherence, see above). Moreover, water managers realised that the goals mentioned above could be achieved much more effectively and efficiently if next to internal coherence (internal integration), an adequate tuning with other related policy domains would be achieved. This approach was referred to as external functional coherence, or external integration. Together, the notions of internal and external integration as introduced in the middle of the 1980s were referred to as 'integrated water management' (Ministerie van Verkeer en Waterstaat, 1998: 5).

In The Netherlands, the term 'integrated water management' was introduced in the report '*Omgaan met water*' (Living with water) (Ministerie van Verkeer en Waterstaat (V&W), 1985). The term had occasionally been used on a regional scale before the publication of this report, but '*Omgaan met water*' was the first report by the national government in which the term was used. Therefore, the inclusion of the concept in this report represents the concept becoming part of the dominant discourse in water management. Central in this document is the 'water systems approach' (*watersysteembenadering*). The goal of the water systems approach, as defined and described in this report, is on the one hand seeking coherence between water quantity and quality management and on the other hand an integrated approach of surface and ground water. In this approach of functional coherence, the emphasis was laid on ecological aspects of water management. Besides this functional coherence, the water system approach also entailed that the needs of society are no longer pivotal, but rather the possibilities of the (entire) water system. The water systems approach envisages to 'tune the needs of society with regard to the functions and functioning of water systems (sectors and facets) optimally to the possibilities of the systems by means of a technical (infrastructure) and juridical set of instruments' (Ministerie van V&W, 1985: 33). The specification of technical and juridical instruments as the proper types of instruments to operationalise this approach reflects the fact that in the middle of the 1980s, the belief in the 'manageability of society' (*maakbaarheid van de samenleving*) was the dominant policy paradigm. Economic policy instruments were hardly in the picture yet. The remarkable, new thing of the water systems approach is that healthy water systems were taken as a starting

point for policymaking. This was a change compared to the previous, sectoral water policy, in which water policy was tuned to the needs of a selective group of specific (economic) interests, such as safety, agriculture, (water) transport and safe drinking water, from an anthropocentric perspective.

A few years after the issuing of the report *Omgaan met water*, the 'water systems-approach' was laid down in the third white paper on water management (*NW3*) as 'the mode of operation through which the management of waters is approached, and which takes as a starting point the cohesion within water management (as a government task) and that of water management with its relevant environment' (Ministerie van V&W, 1989: 12). The concept of 'integrated water management' was defined in *NW3* as 'coherent policy and management executed by several public organisations with strategic and management tasks in the field of water management, in the light of the water systems approach. This approach takes account of both internal, functional coherence and external functional coherence'. According to Van Ast (2000: 120), this definition means that the use by people of their natural environment becomes embedded in an ecological framework. The concept of integrated water management is therefore, according to Van Ast, a special case of the ecosystems-approach, specified for water. According to Enderlein (1994: 30), an ecosystems-approach to (fresh) water management means 'a holistic approach to the environmentally sound management of inland water resources and riparian vegetation, wetlands, riverine floodplains and associated wildlife and habitats (...). The approach recognises the social, economic, technical and political factors that affect the ways in which human beings use nature, because of their ultimate effect on the integrity of the ecosystem'. According to Allen, 'adopting an ecosystems approach means undertaking holistic planning, research and management' (Allen et al., 1992: 1).

According to Van Ast (2000: 120), adopting an ecosystems approach for the management of water systems implies a transition from management of services provided by water systems, to management of the use of these services or, in other words, a shift from supply management to demand management. The World Bank (1993: 5) defines demand management in water management as 'the use of price, quantitative restrictions, and other devices to limit the demand for water'. Implementing integrated water management through the concept of demand management may be an important argument for the use of economic policy approaches in water management. Economic policy approaches aim to influence the decision-making process of economic actors. Therefore, they are in principle very suitable for demand management. The importance of demand management is stressed by the European Union in their Water Framework Directive (WFD), stating in Article 9 that 'Member States shall ensure by 2010 that water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives of this Directive' (EU, 2000). It can be argued that demand management is especially important in areas where water is scarce and where there are no possibilities to enhance supply.

As follows from the definition above, integrated water management in the 1980s was perceived as the vertical and horizontal, internal and external integration (coherence) of public water policy. Vertical integration meant the tuning of water policy and management between the national government, provinces, water boards and municipalities. Since the introduction of the concept, water related policy at European and global level have grown in

importance. Policy at the European level has shown considerable growth for some time, but has become a dominant level of policy since the introduction of the European Water Framework Directive (WFD) in 2000 (EU, 2000). In this WFD guidelines have been stipulated for all member states with regard to especially water quality management. Member states have to take account of these guidelines in the formulation of their national water policy. Therefore, the level of the EU should be added to the range of policy levels that act as an element of vertical integration. Chapter 4 will pay special attention to EU water (related) policy and its consequences for economic policy approaches in Dutch water management.

Since its introduction, many discussions have been held among scientists, politicians, civil servants and the public in general about the concept of integrated water management. The dominant perception of the concept as it was shaped in the 1980s (that of vertical and horizontal, internal and external integration of policy within the public sector) has both been praised and criticised. It has been praised as an onset for better tuning between governmental organisations, it has been criticised for its narrow interpretation of integration as an 'internal matter' for public organisations. According to critics, integrated water management should also include integration between governmental organisations and private actors involved in water policy and management. These actors can be citizens, non-governmental organisations, target groups of water policy, business, consumers, and the like. Van Ast refers to this tuning with other, non-governmental actors, combined with an interaction with ecosystems, as 'interactive water management' (Van Ast, 2000: 125 and further).

In chapter 2, it was argued that a policy discourse typically relates to one policy issue or domain, and therefore each issue or domain is likely to have its own discourse. This situation is not likely to further the integration of water management. An important step towards integrated water management would therefore be to arrive at one discourse regarding an integrated approach towards water issues among all policy domains and all actors involved in water management. That is to say that, ideally, all stakeholders in water management should (roughly) share the same idea of what integrated water management means and what consequences this interpretation has for the way to deal with water systems in relation to all kinds of human (social, political and economic) activities. If this is the case, it can be said that a dominant discourse exists about the way to interpret, translate (make operational) and implement integrated water management. To put it differently, in that situation, the meaning, the 'translation' and the implementation of the concept of integrated water management have been standardised. In order to arrive at an integrated approach, it should then be made sure that the discourses about separate issues in water management (such as pollution, water quantity management, water chain management) are tuned with this dominant interpretation of integrated water management. In other words: it should be agreed what integrated water management is and what preconditions all activities related to water management need to meet in order to contribute to an integrated approach. In this thesis, the focus with regard to discourse is on the operationalisation and implementation of integrated water management through economic policy instruments and evaluation methods.

PARALLEL WITH SUSTAINABLE DEVELOPMENT

In this passage, it will be argued that the concept of integrated water management (in its broad interpretation as 'interactive water management') shows many similarities with the concept of sustainable development, both in character and in substance. Therefore it is argued that integrated water management may be regarded as 'sustainable water management'. Regarding integrated water management as the application of the concept of sustainable development to the domain of water management enables the drawing of parallels between the two concepts and the way they are being made operational. For example, since (at least in the initial phase after its introduction) sustainable development was strongly associated with environmental policy, this evoked analysing possibilities for applying elements of environmental policy (such as concepts, principles and policy instruments) to the domain of water policy. These parallels will be further explored in this chapter and in the empirical chapters.

With the introduction of integrated water management in the mid 1980s, the upcoming rise of the concept of sustainable development can already be felt in the way of thinking about water management. Both the plea for a long-term vision and the incorporation of effects on a higher systems-level, which can both be regarded as elements of sustainable development, are clearly present in the report '*Omgaan met water*' (Ministerie van Verkeer en Waterstaat, 1985: 9). When the concept of sustainable development was introduced as a policy goal in The Netherlands (see Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer et al., 1988), it could easily be incorporated in *NW3*, issued in 1989. As was mentioned before, the central goal of Dutch water management was formulated in this paper as: 'having and keeping a safe and liveable land as a primary condition and the development and conservation of healthy water management systems that guarantee a *sustainable* use' (Ministerie van Verkeer en Waterstaat, 1989: 12). The concept of sustainability was elaborated (made operational) in the *NW3* of 1989 by setting ecological goals based on a reference situation, in line with policy on nature and the environment. The term 'sustainable' is part of a number of definitions of integrated water management. De Jong (1993: 14) states that integrated water management is about 'the total of plans, actions and researches, that concentrates on the *sustainable development* of water systems'. Saeijs (1995) described the concept of integrated water management as 'the total of intentions, actions and researches, for the purpose of the development of water systems for a *sustainable* use. In this approach, attention is paid to the cohesion and interaction between the different (parts of the) water systems, the interests related to water management and the possibility of influencing the state of water systems through policy, management, organisation and finance'. Sustainability is also part of the central goal of *NW4* (the fourth white paper on water management) of 1998 (Ministerie van Verkeer en Waterstaat, 1998: 5), which was adopted from *NW3*. This indicates that the concept of sustainability has gained a central position in public policy relating to water.

3.2.4 KEY ELEMENTS OF INTEGRATED WATER MANAGEMENT

Although discourse is still going on about the meaning and operationalisation of integrated water management, it can be argued that the interpretation of the concept as adopted by the central government represents the dominant discourse. A number of key characteristics

can be identified in this interpretation. These will be described in this subsection. According to Van Ast (2000: 123), the following inventory can be made of the main components of the concept of integrated water management, as they are, amongst others, incorporated in the *NW3* (see also Van Rooy (1995)):

- guaranteeing safety, soil use and other sectoral functions;
- water systems approach;
- relation with societal sectors;
- sustainability.

These components will be explained a little further here:

- Ad 1: the achievements of former historic phases in water management are reflected in integrated water management. In the order of priorities, safety for the people comes first. The second goal is to (largely) keep intact the (present) soil use, and thirdly, water management should guarantee the use functions assigned to certain areas.
- Ad 2: the approach of water as (part of) a system implies an integrated perception of water quality and quantity, both in relation to surface and groundwater (internal functional cohesion). The water systems approach also means that effects of human activities on water systems and the effects of water systems and water management on society should be analysed at the level of complete water systems;
- Ad 3: Van Ast (2000) criticises the original concept of integrated water management, because it only envisions (horizontal and vertical) integration between public water managers. In his view, interaction with both society and ecosystems (the social and ecological dimensions of sustainability) are essential elements of integrated water management.
- Ad 4: the notion of 'sustainable development' to a large extent reflects the goals of integrated water management. Central goal is the preservation of natural resources, by taking into account the limits of ecosystems. Besides, the concept of sustainability introduces goals with regard to economic and social equity into the concept of integrated water management.

From the description above, it can be concluded that in the dominant interpretation of integrated water management in the 1990s, existing, sectoral values (safety, soil use and other sectoral functions) were combined with new, 'integrative' concepts (water systems approach, relation with societal sectors, sustainability). Combining old and new concepts and old and new goals in water management is due to create conflicting situations, in which choices have to be made. In fact, this is likely to be the case for any issue in integrated water management, since the nature of this concept is to incorporate all interests involved. Therefore, integrated water management can also be regarded as 'making well informed choices with regard to the balancing of functions water systems (are to) provide to both human society and nature'. In order to be able to do this, those actors that make these choices need to know all functions water systems can provide, the need for these functions by society and nature, and (thus) the value of these functions. These steps can be regarded as pre-conditions for making 'integrated' decisions. According to this interpretation of integrated water management, interests related to water, the functions water systems provide to society and ecosystems, the (related) value of these functions and human activities having an impact on this value are all closely related. As we will see later, when

discussing basic assumptions of economics, objectifying value (by expressing value in one common denominator) is an important function often assigned to economics.

3.2.5 FUNDAMENTAL CONCEPTS AND POLICY PRINCIPLES FOR INTEGRATED WATER MANAGEMENT

FUNDAMENTAL CONCEPTS FOR INTEGRATED WATER MANAGEMENT

Saeijs (1995) illustrates the character of integrated water management by giving a description of the transition from sectoral to integrated water management by means of a number of keywords: 'from curative to preventative; from struggle against to harmony with nature; from reacting on phenomena to anticipating via a process approach; from sectoral to integrated (holistic); from water as a utility, to water as a part of the ecosystem, with potential for development; from time and again interfering and see what comes from it to robust, self-regulating systems, by application of techniques based on ecological knowledge; from out-of-the-blue interference to guided ecosystem development'. A number of the concepts introduced in this description and related concepts for integrated water management discussed earlier will be explained shortly below.

- The eco-systems approach is the ecological version of the water systems approach (i.e. a water systems approach focusing on the ecological dimension). It means that water systems should be regarded as (aquatic) ecosystems and that it should be recognised that any human activity in a river basin can influence the functioning of these ecosystems. Besides, it should be recognised that the paradigm regarding the man-nature relationship that actors adhere affects the way this ecosystem is treated;
- The sustainability approach means that decision-making processes (in this case related to activities potentially affecting water systems) should take into account the consequences of these activities for other humans, for the environment and for future generations, to make sure that present-day actions do not reduce the quality of live of future generations;
- As was indicated above, integrated water management means taking into consideration all interests involved in water systems and water management. All policy principles and concepts that aim to force decision-makers (both public and private) to take into account/realise the consequences of their actions on others and on the environment in principle serve this aspect of integrated water management. As was mentioned before, a specific aspect of integrated water management is the shift from supply management to demand management. This shift indicates that water management should be organised in such a way that actors using and/or polluting water realise that they can no longer do that for free;
- The guided eco-system approach aims to make the value of healthy (aquatic) ecosystems for society more explicit and aims to base decisions with regard to water management on the analysis of the consequences of activities for water systems as aquatic ecosystems.

As shows from the description of these concepts, they are very related in nature and all take healthy (aquatic) ecosystems as a precondition for quality of (human) live. Whether this is the dominant discourse about the operationalisation of integrated water management into more operational concepts is a matter of empirical analysis.

POLICY PRINCIPLES FOR INTEGRATED WATER MANAGEMENT

Saeijs and Van Ast (1996: 245) list a number of juridical principles from the water and environmental legislation that, according to these authors, form the backbone of integrated water management. The fact that juridical principles are listed emphasises the focus on the legal system for shaping integrated water management in the early days of the introduction of the concept (see earlier). The focus of this thesis on economic policy approaches to water management might lead to thinking that the legal framework for water management is not of primary relevance. However, the legal framework plays an important role as a backbone for economic policy instruments and evaluation methods. It constitutes an important part of the formal institutional setting. Policy principles were already mentioned in the previous chapter as first steps in making belief systems operational and therefore as 'precursors' for policy instruments. Since these principles are (for a large part) derived from environmental legislation, they are mainly related to and relevant for water quality management:

- a. *Obligation to care for the environment.* This principle is included in the Environmental management act (*Wet Milieubeheer*) of 1993;
- b. *Precautionary principle.* Damage to the environment or to third parties has to be prevented as much as possible. Even if it has not been scientifically proven that effects occur (but neither that they do not), a cautious approach should be the starting point. It should be noted that this principle may conflict with an economic approach to water management, since, as was argued by Russell (2001, see chapter 2), such economic approaches are basically risk-seeking in nature;
- c. The *ALARA-principle*. The ALARA (As Low As Reasonably Acceptable/Achievable)-principle sets a norm for damage to or pollution of the environment. This principle is often translated into technical standards for prevention and abatement technologies, such as the BPM-standard (Best Practicable Means) and the BAT-standard (Best Available Technique). The latter is often eased down as BAT-NEEC-standard (Best Available Technique - Not Entailing Excessive Costs);
- d. The *risk principle*. This principle is used to determine liability for soil- and ground water pollution in the Soil protection act (*Wet Bodembescherming*) of 1986;
- e. *Compensation principle*. This principle states that in case a valuable commodity, such as a nature reserve, is going to be damaged by certain activities, a substitutive commodity has to be provided for elsewhere by the person or entity damaging the commodity. This principle is used in situations of clearance according to the Clearance Act (*Wet Ontgrondingen*) of 1965 and the Forest act (*Boswet*);
- f. The *standstill principle*. This principle states that pollution may not increase relative to the situation at a certain moment of reference. This principle is applicable according to the Surface water pollution act (*Wvo*);
- g. *Mitigation at source-principle*. This principle states that in case environmental damage occurs, it is preferable to prevent emission at the source compared to taking technical measures to mitigate the effects of the emission;
- h. *Uniformity of interest, payment and influence*. This principle is the starting point of the financing and organisation of water boards as laid down in the Act on water boards (*Waterschapswet*) of 1992, and is the oldest financing principle in Dutch water management;
- i. The *polluter pays principle*. This principle lies at the basis of the Surface water pollution act (*Wvo*) and was also laid down in the ECE-convention;

- j. The *user pays principle*. This principle was introduced in upstream riparian states of the major rivers in The Netherlands. There, it is the basis for compensation to farmers in water win areas;
- k. *Decentralisation principle*. This principle means that tasks and responsibilities are being delegated to the lowest operational level possible;
- l. *Subsidiarity-principle*. This principle is equivalent to the former, but was introduced with regard to the international policy of the European Union. The principle means that the EU should not act if measures can be better taken at the level of Member States.

In the empirical chapter, principles for water policy making part of white papers at various levels of water policy will be compared to these basic juridical principles for integrated water management in order to obtain an indication of the degree to which these white papers conform to these principles.

3.2.6 CONCEPTS FOR THE ORGANISATION OF INTEGRATED WATER MANAGEMENT

This subsection will discuss a number of concepts for making integrated water management operational⁴⁴. In the preparation of *NW4*, policy based on *NW3* was evaluated. This evaluation is reflected in the vision papers '*Ruimte voor water*' (room for water) (Ministerie van Verkeer en Waterstaat, 1995) and the '*Schetsboek voor een vierde Nota waterhuishouding*' (sketchbook for a fourth policy paper on water management) (Ministerie van Verkeer en Waterstaat, 1996). In these papers, the conclusion was drawn that the concepts of 'integrated water management' and 'water systems approach' have led to important progressive steps, especially with regard to integrated management of surface water systems (Ministerie van Verkeer en Waterstaat, 1998: 6). However, it was also indicated that the concrete elaboration, design and implementation of these concepts in practice lagged behind the progress in strategic integration. Based on the above-mentioned vision papers, a discussion was started, by means of an open planning process, about the water policy to be adopted and the way to make the concepts mentioned operational.

A vast number of organisational changes have been proposed for the operationalisation of integrated water management and the water systems approach. As far as the integration of different policy domains related to water management (*external functional cohesion*) is concerned, the integration of all rules relating to water issues into one integrated water law is regarded as necessary by many (see, for example Saeijs et al., 1999: 331). Others, however, do not consider this one law essential and see ample possibilities for further integration based on existing laws and regulation, for example in relation to spatial planning. In The Netherlands, the horizontal integration could lead to one national white paper for the physical environment, in which the white papers for water management, spatial planning, the environment and nature conservation are combined and integrated. The call for a strong integration has culminated into concepts such as '*omgevingsmanagement*' (comprehensive

⁴⁴ The fact that the concept of integrated water management is made operational via the formulation of other fundamental concepts and operational concepts shows that the policy element 'concepts' can have various degrees of concreteness.

management of the physical environment), *'totaal waterbeheer'* (comprehensive water management), *'integraal waterketenbeheer'* (integrated water chain management) and *'integraal omgevingsbeleid'* (integrated policy for the environment), executed by *'integrale omgevingschappen'* (public authorities for the comprehensive management of the environment). Central in this comprehensive management of the environment is an *'integraal omgevingsplan'* (integrated policy plan for the environment) (CKC, 1996). According to some, for this purpose, the national government could suffice with one department for policy relating to the physical environment (see f.e. Van Hall, 1997: 45).

3.2.7 SUMMARY OF KEY CHARACTERISTICS

As was shown in this section so far, views diverge with regard to the meaning of the concept of integrated water management and the way this central concept should be made operational via other elements of policy. Some of the aspects of the concept itself and concepts and principles for its operationalisation can be claimed to be dominant in the discourse about integrated water management. These were discussed in the subsections 3.2.4 and 3.2.5. These key characteristics will be used in the remainder of this chapter when comparing the characteristics of economic policy approaches with the starting points of integrated water management. The key characteristics of integrated water management as discussed above are summarised in table 3.1 below. The meaning of the characteristics and its consequences for policy and management are shortly described for each characteristic in the second column and the related principles and concepts as identified by Saeijs and Van Ast (1996) are listed in the third. The description of the characteristics of integrated water management and its operationalisation via principles and other concepts all indicate that integrated water management is about holistic decision-making, with a risk-avoiding attitude towards the use of the environment as a whole and nature in particular.

Table 3.1: key characteristics of integrated water management and related principles and concepts

Aspect	Meaning and consequences for policy and management	Related policy principles and concepts
water systems approach	Cohesion within water management (internal cohesion) and between water management and its environment (other policy domains, society) (external cohesion)	Water as a leading principle for spatial planning, sustainable development, mitigation at source principle.
eco-systems approach	holistic approach, recognising social, economic, technical and political factors that affect the way in which humans use nature	Polluter pays principle, precautionary principle, standstill principle, obligation to care for the environment, risk principle, compensation principle, mitigation at source principle.
towards demand management	regulating the 'amount' of water used, instead of regulating the 'amount' of water provided (supply management) via incentives to user	Benefit principle, cost-causer principle, polluter pays principle, risk principle, compensation principle, full cost recovery principle
sustainability	long-term vision, incorporation of effects on a higher systems level	Precautionary principle, stand-still principle, sustainable development, obligation to care for the environment, ALARA-principle, principle of preventative action

interests	dealing with all interests in water management, including those of nature and the environment and of society as a whole	Benefit principle, cost-causer principle, polluter pays principle, user pays principle, compensation principle, river basin approach, cost-effectiveness principle, equity principle
towards an integrated approach	from sectoral to integrated (holistic) from curative to preventative from opportunistic towards a process approach	All principles
guided eco-system development	create robust, self-regulating systems	Precautionary principle, stand-still principle, water as a leading principle for spatial planning, sustainable development, compensation principle, river basin approach, cost-effectiveness

(Source: partly modified from Saeijs and Van Ast (1996))

3.3 BASIC CONCEPTS, PRINCIPLES AND ASSUMPTIONS OF ECONOMIC THOUGHT

As was announced earlier, this section will discuss basic concepts, principles and assumptions of economic thought. The purpose of this section is to be able to confront these concepts, principles and assumptions with those of integrated water management, in order to be able to draw some conclusions about the theoretical applicability of economic policy approaches in integrated water management, both from the perspective of integrated water management (what preconditions do economic policy approaches have to meet to contribute to integrated water management and can they, in principle?) and from the perspective of economic approaches to issues in water management (is the nature of issues in water management such that they can be addressed via an economic policy approach?). Besides, these concepts, principles and assumptions of economic thought are input to discourse about policy instruments. The questions in this respect are whether or not the assumptions made in economic theory⁴⁵ hold in practice, whether the preconditions can be met and whether the theoretical advantages can be found. As such, this section relates most to elements (e) (resources of actors, including story lines) and (f) (struggle for discursive hegemony) of figure 2.6. These storylines are fed by scientific (economic) paradigms (part of element (i)) and may be fixed in institutions (h) depending on the dominant discourse (g) resulting from the struggle for discursive hegemony. The criteria for economic approaches in water management resulting from economic theory correspond with element (d) of this figure.

3.3.1 SCARCITY

According to Dietz et al., the study object of economics can be explained by distinguishing between the 'material object' and the 'formal object' (Dietz et al., 1994: 15). The material

⁴⁵ Actually, there is no such thing as one 'economic theory'. Rather, various schools of economic thought have different starting points, theorems and assumptions about actor behaviour in situations of relative scarcity.

object indicates what aspect of reality is the subject of study, and, according to Dietz, in economics this is society. Economics studies human behaviour, relationships between humans and social institutions (government, unions, etcetera) and abstract institutions like money, markets and democracy. Usually, however, economics is defined with respect to its formal object, which states the perspective from which reality is studied. In this respect, economics is concerned with the allocation of scarce resources, including land, labour, capital and natural resources. Scarcity refers to a situation where the wants (or preferences) of an individual or group of individuals exceed the resources available to satisfy those wants (Bannock et al., 1987).

According to Dietz, the central characteristic of economics (and economists), is its consequent analysis of societal phenomena in terms of relative scarcity. The word relative is essential here, because absolute scarcity is not an economic problem, but a technical one (see Dietz, 2000: 66). Relative scarcity is described by Dietz (and many others) as the tension between desires (or needs) and means⁴⁶. Or, in other words, relative scarcity is the situation in which there are not enough means to meet all needs. Scarcity forces to make choices: satisfaction of one need means that other needs cannot be (completely) fulfilled. This problem is present both at the individual level and at the level of a group or society as a whole⁴⁷. For both individuals and society as a whole economic theory states that as more needs are satisfied, scarcity is reduced, and welfare increases.

In all societies, resources are inadequate to produce all the goods and services necessary to satisfy the desires of this society (Wills, 1997), and thus situations of relative scarcity exist. Economists want to know what choices people make in situations of relative scarcity (Dietz, 2000: 63). In the classical school of economics, these individuals are represented by and interpreted as the *Homo Oeconomicus*: an autonomous rational person. In making their choices, rational individuals as a rule seek to satisfy their preferences in a pursuit of individual welfare maximisation. Individual welfare, also known as utility, is the amount of preferences an individual can satisfy, given the relative scarcity of resources (Dietz, 2000). The preferences that individuals have are revealed by the choices they make, but the reasons for these preferences, or motives, are not explained by this behaviour. In other words, economics studies the choices individuals make in the context of scarcity, while the motives on which these choices are based are treated as exogenous variables (Dietz, 2000). The assumptions of rationality and stable preferences, therefore, do not account for preferences that differ among individuals and change over time, nor for the capability of humans to act altruistically (Turner et al., 1994).

In this thesis, it is believed that preferences of (economic) actors are context dependent, and therefore, the assumptions of rationality and stable preferences are rejected as starting points for a model of actor behaviour. Besides, the motives of actors involved in decision-making are assumed to depend on the context as well, and are thus not treated as exogenous variables. Motives are considered important drivers for the construction of policy

⁴⁶ In common economic terms, this situation can be indicated as the tension between demand and supply of a commodity.

⁴⁷ This distinction is relevant for the discussion of the functions and functioning of economic steering instruments on the one hand and economic evaluation methods on the other.

arrangements, and therefore are an explicit part of the analytical framework of this thesis. For that reason, models of (economic) actors and their behaviour based on the assumptions of rationality and stable preferences are not accepted as starting points for empirical analysis. Instead, it was chosen to study the discourse about policy approaches based on these assumptions. Besides, the interests of actors involved in policy-making are believed to extend beyond financial or economic interests. Therefore, concepts derived from sociology and policy analysis were considered more suitable as a basis for the analytical framework. Nevertheless, it is important to know what assumptions economic theory makes about the behaviour of actors in situations of scarcity in order to understand the (supposed) rationale for economic approaches to policymaking.

3.3.2 ECONOMIC ANALYSIS OF SOCIETAL PHENOMENA

Dietz (2000: 64 a.f.) lists a number of criteria that have to be fulfilled to allow for an economic analysis of a societal phenomenon. At the first place, this is relative scarcity, which was discussed above^{48,49}. Robbins (1935: 13-14; 34-35) indicates that the condition of relative scarcity is a necessary, but not a sufficient condition for the existence of an economic problem. Besides this, it must be possible to use the relatively scarce means for the satisfaction of *several* needs. In other words, it must be possible to do something about the scarcity by using the available means in a different way. This condition is called the *condition of alternative usability*⁵⁰. A third condition for a problem to be addressed as an economic one is that of *rankability*. Only if needs can be arranged in an order of urgency, decisions about the application of relatively scarce, alternatively useable means for the satisfaction of needs can be made. Without such a hierarchy of needs, an economic subject (actor) cannot choose, and, as was indicated before, economics as a scientific discipline studies processes of choice. In order to be able to rank scarce means, actors need to be well informed about the value of these means. Being well informed about the value of commodities is thus an important precondition for making economic choices. Clearly, this is also true for decisions in policymaking based on economic analysis.

⁴⁸ Although one usually speaks of the scarcity of a good or service, it is more accurate to speak of scarcity of a specific characteristic of a good or service, since a good usually fulfills several functions and therefore has just as many characteristics. Therefore, it is better to treat a good or service as a bundle of characteristics (see Lancaster, 1971; Sen, 1985). Because of the various use functions of many goods and services, and in line with the term 'bundle of characteristics', property rights of goods or services are usually referred to as bundles of property rights as well.

⁴⁹ Opposite to scarce goods are goods that are abundantly available goods or '*free goods*'. Goods are free if they are so abundantly available that they can satisfy all needs. 'Free goods' should not be confused with 'free water'. Free water is interpreted in this thesis as all water that is not contained in man-made structures that prevent this water from interacting with its environment. Free water may be so abundantly available that it satisfies all needs in its basin, but this usually not the case. If this would be the case, there would not be a rationale for an economic analysis of or economic approach to its use, since there would not be a situation of relative scarcity.

⁵⁰ Robbins (1935: 35) cites Mayer's clarifying distinction: 'the problem of technique arises when there is one end and a multiplicity of means, the problem of economy when both the ends and the means are multiple'.

3.3.3 MARKETS

Scarce resources are usually allocated in the market place, where consumers that demand goods and producers that supply goods meet and interact. Markets are thus institutions designed for the (re-)allocation of scarce goods via the exchange of these goods (transactions). The fundamental theorem of welfare economics states that in perfect competition, the market mechanism provides for an efficient allocation of resources (Nas, 1996). Efficiency in economics is defined as allocative efficiency, which is met when the criteria of production efficiency and exchange efficiency are met (see for example Nas, 1996). If these criteria are met, economists speak of a Pareto optimum situation. In this state, no economic actor can improve his situation without deteriorating the situation of other actors. The interaction of supply and demand results in resource prices. According to economic theory, in a perfect market, prices allow for an optimal allocation of scarce resources. In this situation, they are the main orientation point for consumers and producers in making economic decisions. In other words, prices, and especially changing prices, have an information function (Dietz, 2000). Ideally, the relative scarcity positions of resources are reflected in their prices; a change in these relative scarcity positions then results in a change in prices. Changes in prices in turn lead consumers and producers to react and adjust their demand and supply of the resources such that an efficient allocation of the resource is secured (Dietz, 2000).

Turner et al. (1994: 23) list the conditions for obtaining efficient allocation through the market mechanism. According to them, efficiency in a market is maximised as long as the structural conditions for perfect competition are satisfied:

- a) Large numbers of buyers and sellers;
- b) Perfect information;
- c) Goods being exchanged can, in principle, be individually owned (that is to say that property rights are perfectly defined);
- d) The full costs of production and consumption are reflected in market prices.

If one or more of these conditions are not fulfilled, allocation of goods and services through the market mechanism is sub optimal. This sub optimal allocation will be more often the case with goods and services that do not have clearly defined property rights (see condition c) than with goods and services that do. This sub optimal allocation can be a motive for public authorities to intervene in sub-optimal markets. This government intervention will be discussed below.

3.3.4 RATIONALE FOR GOVERNMENT INTERVENTION

MARKET FAILURE

In real markets, a Pareto optimum situation in the market place is seldom attained, a situation that is referred to as *market failure*. One cause of market failure is the absence of perfect competition, as is the case with increasing returns to scale and asymmetric information between buyers and sellers (see for example Mamuth, 1993). In the absence of perfect competition, consumers and producers do not have access to perfect information, since prices do not accurately reflect the balance between supply and demand. Another

cause for the existence of imperfect markets is the existence of transaction costs. Actors in a market need to make costs to obtain the information they need for making a transaction and for constructing a contract (the purpose of which is a reduction of uncertainty, see for example North, 1990) between buyer and seller. Often, the existence of transaction costs leads to a situation in which no transaction takes place, whereas this transaction would have taken place if transaction costs had been absent. In this situation, transactions costs are an inhibitive factor and no optimum allocation of goods and resources takes place.

A third cause of market failure is the prevalence of *external effects* (or *externalities*) in production and consumption. External effects appear when the consumption or production by one actor or group of actors affects another (group of) actors without compensation for those effects taking place (Mamuth, 1993). They may be caused by imperfect information, represented by prices that do not reflect all values (negative and positive) of a good being traded. Mamuth (1993) states two main reasons for external effects:

- the effect is a by-product of consumption or production;
- a lack of well-defined property rights.

An example of the first cause is pollution to air or water associated with certain production processes of factories. The prevalence of the second aspect, a lack of well-defined property rights, means that it is impossible to determine who should pay for the consumption of a certain good. Property rights reflect the owner's right and privilege to use the resource (Tietenberg, 1992). De Vries (1992: 43) explains that the exchange of scarce goods is in fact a trade in 'bundles of property rights'⁵¹. Property rights can be defined as 'the total of economic and social relations that determine the position of each and every individual towards the use of scarce resources' (De Vries, 1992: 44). Well-defined property rights fulfil four criteria (Tietenberg, 1992):

- 1) Universality: resources are privately owned and ownership is completely specified;
- 2) Exclusivity: all costs and benefits as a result of resource ownership and use accrue only to the owner (in the case of externalities, this criterion is not met);
- 3) Transferability: all property rights (all property rights of a resource) are transferable from one owner to another;
- 4) Enforceability: property rights protect the owner of the resource from involuntary seizure of the resource by others.

Goods or services not fulfilling one or more of these criteria may give rise to externalities.

Property rights approach: denial of the need for government intervention

The need for government intervention can be made tangible via the debate about the property rights approach⁵². A number of criticisms of and complications with the Coase theorem have subsequently been explored in literature. These include the existence of imperfect competition, high transaction costs, difficulties of polluter and sufferer identification and threat-making behaviour. Therefore, the argument that in principle, on efficiency grounds, it makes no difference which party holds the property rights of a commodity, can be questioned as for its validity and usefulness in reality. According to critics of this view, in the real world, partly as a consequence of the aforementioned imperfections,

⁵¹ See for example Varone et al., 2002. These authors distinguish various types of property rights, such as ownership, disposition and use rights.

⁵² For a discussion of the property rights approach, see for example Coase, 1960.

it surely matters a great deal which party has the property right and much public policy reduces to struggles over which parties can get the state on their side in order to get political and institutional support for their position (Turner et al., 1994: 153; see also Dietz, 2000). One of the reasons this matters is that the initial distribution of property rights determines whether or not actors are granted a right to pollute the environment or use natural resources. Besides, the existence of imperfections in the market (such as asymmetry of information and (other) transactions costs) can prevent the transfer of property rights by bargaining between private actors, even though this could be expected from the point of view of utility maximisation. Therefore, in this thesis, the property rights approach as formulated by Coase is rejected. More than that, the initial distribution of property rights of natural resources is regarded as an important part of the institutional framework that can be used as a resource in the discourse about the allocation and use of these natural resources.

NATURAL RESOURCES

Natural resources (such as water) are characterised by the fact that they often lack well-defined property rights. The lack of well-defined property rights results in a characterisation of most natural resources into public goods and common pool resources⁵³. Examples of public goods related to water management are 'natural retention capacity' and 'purification by aquatic ecosystems'. Examples of (possible) common pool resources related to water management are fish and (fresh) water. Both public goods and common pool resources are subject to external effects, and since most environmental goods and services are public goods or common pool resources, markets often fail with respect to the efficient allocation of environmental goods and services. In mainstream (neo-classical) economics, market failures can be a motive for allowing governments to intervene in markets to protect those who suffer from externalities. In theory, government authorities have several ways of intervening in societal and economic activities. These means for intervention in societal activities in general and economic activities in particular will be discussed in the next section. Besides the correction of external effects, other motives for government intervention are the provision of public goods and services, and the support of weak or un(der)represented interests in society. Public authorities may provide these goods or services outside the market mechanism, or may provide these groups with positive financial incentives (such as subsidies, soft loans and reductions) to enable these groups to get access to these goods in the market.

TOTAL VALUE AND TOTAL ECONOMIC VALUE

In the previous subsection, the focus was on negative externalities of human activities on the environment. However, damage to the environment from human activities is but one side of the coin. Besides the fact that the negative effects of economic activities on certain aspects of the environment are often not included in the price of these activities (negative externalities), the (positive) value of the environment for the well-being of society via the 'supply' of specific goods and services is often not completely included in public and private

⁵³ For a discussion of the characteristics of and differences between public goods and common pool resources, see for example Wills (1997).

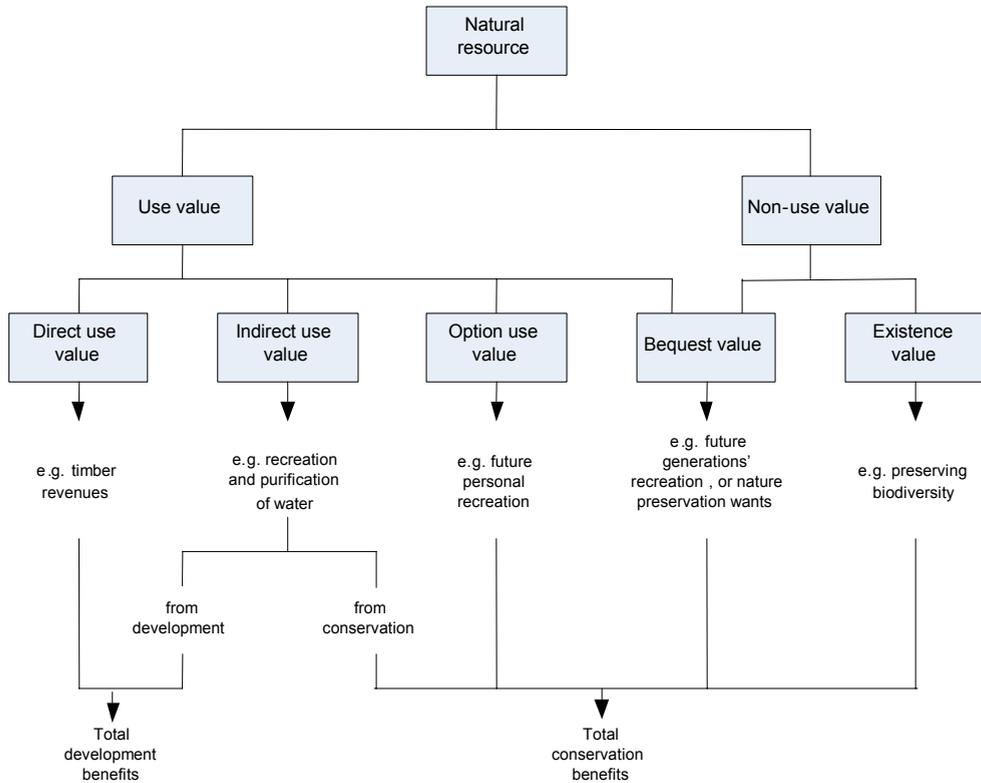
economic decision-making either. Since the value of a good or service is the most important (or even sole) criterion for making decisions about this good or service, this indicator for decision-making is relevant for all decisions, be them decisions by economic actors in markets or decisions by public actors with regard to public projects. As a consequence, value is relevant for both decision-making about economic steering instruments and economic evaluation methods, respectively. The degree to which the value of the environment for society is included in economic decisions (via prices) can be made visible through the discussion of the concepts of total value and total economic value.

In the discussion of the concept of economic value, it is important to make a distinction between price and value. As was argued before, in perfectly functioning markets, prices of goods properly reflect the (exchange) value of the good expressed in monetary terms. However, for many (natural) resources, markets do not function perfectly, in which case the price for which the resource is traded does not reflect the exchange value of that resource. In other cases, goods and services (including many environmental goods and services) are not even traded in the market place, and thus have no market price at all. However, if (integrated) decisions are to be made that affect these resources, decision-makers need to know what the total value of these resources for society is, or should at least have an idea of this total value.

Economic values of ecosystems are monetary measures for benefits and costs of environmental change (Wills, 1997). One common classification of total economic value into subcategories is the distinction between use values and non-use values⁵⁴. Total economic value should not be confused with total ecosystem value. The aggregate ecosystem possesses primary and secondary value, together comprising the total value of an ecosystem. The primary value is the value of a healthy ecosystem that contributes to the aggregate life support, the value of ecosystems as a basis for life on earth. The existence of this value is a precondition for the use by humans of the range of use and non-use values, the secondary ecosystem value. Economic value only captures secondary value – the primary value is not encompassed by total economic value. Moreover, it must be recognised that other types of ecosystem value exist, such as ecological value, socio-cultural value and intrinsic value, which also cannot or only partly be captured by economic value (De Groot, 1992). Economic values are therefore only one aspect of total resource value (Schuijt, 2003). Economic value is purely based on people's explicit willingness-to-pay or willingness-to-accept estimates for ecosystem goods or services. Therefore, economic value is always a value attributed to goods and services from an anthropocentric perspective (Schuijt, 2003). The concept of total economic value and its elements and its position relative to total value is represented by figure 3.1 below.

⁵⁴ For an elaborate discussion of the various economic values related to natural resources, I refer to Turner et al. (1994)

Figure 3.1: the concept of total economic value



(Source: Turner et al. (1994) : 112)

The point of discussing the concepts of total value and total economic value is the fact that there are two sides to the use of economic steering instruments and evaluation methods in water management from an ecological perspective: giving weight to the negative effects of economic activities on water systems (aquatic ecosystems) in economic decision-making on the one hand and to the positive effects of aquatic ecosystems on society on the other. As we will see later this chapter, traditional economic steering instruments for the environment mainly focus on the former. The height of the incentive given by these instruments is not necessarily related to the damage done to these ecosystems, but rather to the minimum incentive needed to make economic actors make different decisions in this respect. It is based on an acceptable negative impact of human (economic) activities on water systems and aquatic ecosystems. This is referred to as the weak sustainability criterion⁵⁵. The incorporation of the positive value of aquatic ecosystems in economic decision-making does require an estimate of the value of these systems. The discussion of total value and total economic value showed that economic valuation of ecosystems can never capture the total

⁵⁵ The concepts of weak and strong sustainability will be discussed later this chapter, in discussing policy paradigms regarding the man-nature relationship.

value of these ecosystems. Therefore, information about the total value of ecosystems based on economic valuation methods is necessarily incomplete.

3.4 THEORETICAL APPLICABILITY OF ECONOMIC APPROACHES IN INTEGRATED WATER MANAGEMENT

3.4.1 INTRODUCTION

In the previous sections, a number of (discourses about) policy related and scientific concepts were introduced, such as 'integrated water management', 'starting points for economic approaches' and 'rationale for government intervention'. In this section, these concepts are confronted with each other, in order to come to a description of the theoretical suitability of economic policy instruments and evaluation methods for Dutch *integrated* water management. In order to do this, one has to explore the consequences of the characteristics of each of the concepts for the other concepts. Basically, the link between integrated water management and economic policy approaches can be made in two ways. On the one hand, the concept of integrated water management sets preconditions for the type of instruments to be used in water management and the way to use them. The concept can, so to say, be used as a framework of preconditions for policy instruments. On the other hand, economic theory is based on a number of assumptions. These assumptions can be taken as a starting point in analysing whether or not issues in water management can in principle be addressed via economic policy approaches. This section makes a link in both directions, starting with the first. It should be noted that in order to be able to draw conclusions in this section, I chose a specific story line (interpretation) for each of the concepts that are part of this comparison. The confrontation of the concepts in this section therefore results in (a personal) normative discourse about the preconditions for economic approaches in integrated water management, based on theoretical insights from various scientific disciplines and schools of thought. As such, this section relates most to elements (f) and (g) of figure 2.6.

3.4.2 PRECONDITIONS FOR THE USE OF ECONOMIC STEERING INSTRUMENTS AND EVALUATION METHODS FROM THE PERSPECTIVE OF INTEGRATED WATER MANAGEMENT

The description earlier in this chapter of the concept of 'integrated water management' and its operationalisation into policy principles and concepts, yields a number of guidelines for the use of (economic) policy instruments and evaluation methods in water management. It was already concluded earlier that integrated water management comes down to a balanced weighing of interests related to water management, of all effects of human activities on water management, including the effects on water systems as aquatic ecosystems, and of the value of water systems, both for humans and for ecosystems as a whole. For economic policy instruments and evaluation methods, this would mean that these instruments should make (both public and private) economic actors take these aspects into account in their cost-benefit analyses. Based on the description of the characteristics of integrated water management, it can therefore be argued that economic approaches in integrated water management should (and/or):

- serve or improve internal and external cohesion in policy;
- address 'environmental effects' of human activities on (aquatic) eco-systems;
- deal with all effects of human activities (social, economic, technical and political) on water systems;
- and vice versa, see to it that water related goods and services are allocated 'evenly' among stakeholders;
- reflect long-term visions and effects on a higher systems level;
- be preventative rather than curative;
- stimulate robust, self-regulating systems;
- lead to efficient use of water, goods and services of aquatic ecosystems and public financial resources;
- make those actors pay that benefit from water management, from the use of water or that pollute water systems;
- make actors compensate negative effects of their actions on other actors or on the environment;
- make benefits of water and aquatic ecosystems explicit in decision-making.

Economic approaches in water management contribute to integrated water management if, and only if, they meet one or more of the requirements above. These criteria can be grouped into four main categories:

- taking account of *all effects* of human activities on water systems;
- taking account of *all interests* related to water and water systems (including that of future generations and non-human interests);
- taking account of the *sustainability* aspect, which means that water and water systems are dealt with in such a way as to guarantee long-term use of water and aquatic ecosystem goods and services;
- taking account of the *value* of water and related eco-systems for human society.

3.4.3 PRECONDITIONS FOR ECONOMIC STEERING INSTRUMENTS AND EVALUATION METHODS IN WATER MANAGEMENT FROM THE PERSPECTIVE OF ECONOMIC THEORY

In this subsection, I will discuss the preconditions for an economic approach to societal issues from the perspective of economic theory. As discussed earlier this chapter, economic theory is based on a number of assumptions about the behaviour of individuals in decision-making situations (or, more formally, situations of choice) and on a number of preconditions for the circumstances needed to allow for and justify an economic approach to societal issues. For the sake of clarity, the main assumptions and preconditions of economics as discussed before are repeated below⁵⁶:

- an economic actor behaves in a *rational* way (rational calculating actor);

⁵⁶ It must be noted that these assumptions and premises are derived from (neo-) classical economic theory. Other, newer schools of economic thought have loosened or rejected a number of these assumptions. This will have consequences for the types and scope of policy approaches applicable according to these schools of economic thought. A number of these schools of thought will be addressed in this chapter.

- an economic approach (study) of a societal issue is only possible if this issue is characterised by *relative scarcity*;
- the goods and/or services dealt with in the issue at hand *alternatively useable*. This means that these goods and/or services can be used for several purposes, by several different (groups of) actors;
- the economic actors relevant for the issue at hand are able to rank the alternatives presented to them in an order of priority (*rankability*). This means that the importance of the goods and/or services dealt with in the societal issue can be ranked in order of priority relative to other goods and/or services needed by these actors to achieve their goals/satisfy their needs.

If the conditions stated above are met, the allocation of goods and services can in principle be executed via the market mechanism and economic actors can in principle be influenced by public policy via market based instruments. For an *efficient* allocation of goods and services via the market mechanism, some additional conditions have to be met. An important condition for goods or services to be traded efficiently is that their *property rights* are clearly defined, so that no externalities occur. Besides, for goods to be addressed in an economic manner, they need to be valued in monetary terms (*economic valuation*) and for an efficient allocation to take place, the price of a good needs to *properly reflect its value*. In the remainder of the subsection I will discuss to what degree the criteria mentioned above *can* in principle *be* met in water management. Whether or not they *are* in fact met is a matter of empirical analysis.

Rational actors

Economic actors behaving rationally is one of the main premises of neo-classical economics, and one of the most heavily debated ones. Advocates of this premise state that economic actors per definition behave rationally, since otherwise they would not be economic actors. In other words, (neo-classical) economics only studies that part of the behaviour of actors that is concerned with making rational choices when faced with limited resources to fulfil their desires. Opponents of the premise argue that some part of the behaviour of actors in situations of economic decision-making is not rational. For example, people may choose for an alternative not on rational, economic grounds, but on the basis of social, altruistic considerations. Since, these opponents argue, these types of considerations are an inherent and integral part of the decision-making of economic actors, there is no use in separating the rational (economic) and the 'irrational' (non-economic) behaviour of economic actors. It is even argued that separating the two dimensions may lead to dangerous analyses. Some advocates of the premise, in turn, argue that the 'altruistic, social' part of the decision-making of economic actors is also part of rational decision-making, since these actors may expect to get something in return for behaving altruistically. An extensive presentation of this debate would go beyond serving the purpose of this thesis. However, some remarks can be made about the relevance of this premise for economic steering instruments and evaluation methods in water management.

One of the preconditions for economic policy instruments and evaluation methods to fit in the framework of integrated water management is that the price for these resources (and for other goods and services affecting the water system) reflects the (total) value of this water and related resources. Otherwise, rational economic actors would base their decisions in this

respect on incomplete (and therefore false) information. An assumption of (neo-) classical economics with regard to the availability of information, is that in a perfectly competitive market, all actors have full and free access to all information about the product being traded in that market. In other words, these economic actors are perfectly informed about the value of the product being traded, and since these actors make rational decisions on the basis of this information, the market price perfectly reflects the balance between demand and supply and the product is used for its highest value purpose. However, as we have seen in the discussion of total value and total economic value, it is not possible to express the total value of natural resources in monetary terms. The value of a natural resource expressed in monetary terms (i.e. the economic value) is therefore only part of the total value of that resource. Especially with regard to aquatic ecosystems, a major part of its value is not derived from direct or indirect economic use. As was discussed before, making rational decisions on the basis of incomplete information leads to sub optimal allocation of goods and services. Therefore, basing decisions in water management on economic value alone would not meet the pre-conditions of integrated water management.

Another issue with regard to trading natural resources in the market place is their complexity because of the multiple functions they often fulfil. As a consequence of this complexity, it is hard (or even impossible) for economic actors to estimate or calculate even the total *economic* value of these resources. As a consequence, the price for which the natural resource is traded often does not reflect the total economic value of the resource either. Besides, because of their complexity, a transaction in the market place regarding the resource usually involves only part of the total bundle of property rights. Therefore, the price of this transaction only reflects the value of that part of the total bundle of property rights. The discussion of the information aspect of transactions of natural resources shows that these transactions do not easily fulfil the requirements of perfectly competitive markets. In short, there is a serious information problem with regard to these commodities. This is one of the main reasons for government intervention in markets for these resources.

Relative scarcity

As was discussed before, situations of relative scarcity are, in principle (from an economic point of view), suitable for economic analysis and for allocation via a market mechanism. In Dutch water management, no lives are threatened (directly, on the short term) or sacrificed by a shortage of (good quality) water or ecosystem goods and services, but water is not always available in the quantity or quality desired. Besides, goods and services related to Dutch water management may be relatively scarce, even if water itself is abundantly available (or precisely because it is, such as in the case of (the threat of) flooding). Therefore, it can be stated that most, or even all, issues in Dutch water management qualify for the criterion of relative scarcity. Examples of categories of goods and services related to Dutch water management that fulfil the criterion of relative scarcity are water, aquatic ecosystems, public financial resources and space. Below, I will discuss the relative scarcity of two commodities considered especially relevant for an economic approach to water management, namely that of water itself and that of space and land.

Scarcity of water

According to *NW4*, water is a threat if there is 'too much or too little of it, or when it's too warm or too polluted' (Ministerie van Verkeer en Waterstaat, 1998:10). These qualifications

of water (too much, too little, too warm, too dirty) can all be expressed in terms of relative scarcity. The line of reasoning could be as follows: if there is too little water, this water is scarce in a quantitative sense. There is not enough water available to fulfil all the needs for this water. If water is too warm or too polluted, it is scarce in a qualitative sense. There may be enough water available in quantitative terms, but the water cannot be provided in the quality needed. As a consequence, there is still a situation of scarcity. In the situation in which there is too much water, the situation is less straightforward. Not the water itself is scarce (in fact, there is negative water scarcity), but several other 'goods and services' (land, buildings, infrastructure) threatened by the water are. In case of a flood (either from a river or from sea) there is likely to be a lot of damage in The Netherlands because of its high density of investments and the low position of land relative to water systems (and thus the substantial height of inundation). In this situation of (the threat of) flooding, public financial resources are scarce as well. This relates both to financial resources required to prevent floods and the financial resources to mitigate potential effects of floods. The financial resources required to prevent or mitigate floods relate to the issue of efficient public governance: which flood protection strategies are most efficient with regard to the expenditure of public financial resources? This is an issue because public organisations were assigned the task (and thus the responsibility and liability) of flood protection. With regard to this issue, economic evaluation of policy alternatives may play a role. In this approach to scarcity and with regard to investments that have an effect on water and water systems in general, risk-analysis plays a major role. Risk with regard to floods is defined in this report as the chance of a certain event occurring and the effects of that event. Which water related policy or management measure(-s) is/are preferred depends on the effects of these measures on the risk and on the fundamental risk attitude of society towards these risks. These fundamental risk attitudes were already shortly addressed in chapter 2 and are an important element of policy paradigms regarding the man-nature relationship.

Directly above, I discussed some situations in which water can be regarded as a scarce commodity, or situations in which an excess of water can lead to scarcity of other commodities. If we take this line of reasoning broader to include the products and services provided by aquatic ecosystems or river systems as a whole, the range of relatively scarce products and services related to water becomes even larger. Aquatic ecosystems generate various natural resources and fulfil numerous services to human society⁵⁷. Because of the relative scarcity of these goods and services, aquatic ecosystems could, in principle, be addressed in an economic manner (i.e. through the market mechanism, economic steering instruments and pricing or economic valuation). An important precondition for an economic approach is that the value of these systems is fully known and reflected in economic indicators, such as the market price and evaluation methods. As we have seen before, this is far from obvious.

Scarcity of space and land

Another dimension of scarcity related to water management is that of space and/or land. 'Space' (especially its horizontal dimension) and its related resource 'land' are scarce commodities in The Netherlands. There are many (potential) functions for space, and the planning of a certain area for a specific function (purpose) may have consequences for other

⁵⁷ See for an extensive discussion of these goods and services Schuijt (2003).

(potential) functions. For example, enlarging the area of hard surface (through buildings and infrastructure) and cultivation of soil for agriculture in the course of decades (even centuries) have led to an increased and accelerated discharge of water, with the consequences of desiccation, salinisation, subsidence and local and down-stream floods. In recent years, therefore, the call for more room for water, for the purpose of retaining and storing water for dry periods and for reducing the risk of floods and water nuisance, has become increasingly loud. More room for water aims at reducing above-mentioned effects. This spatial approach to water quantity management was recommended by the Tielrooy commission, which was installed to study strategies for meeting the challenge of water management in The Netherlands in the 21st century (Commissie waterbeheer voor de 21ste eeuw, 2000). The consequence of reserving space for water is that this space may no longer be available or suitable for some or any other functions. As a consequence, the remaining space becomes even scarcer. With regard to this increasing scarcity of land, multi-functional land use is proposed as a major solution. According to this idea, efficient use of scarce space by combining functions within one area will lead to socially optimal use of space (and (thus) of public and private financial resources).

Alternative usability

Water and water systems are goods *par excellence* that meet the precondition of alternative usability. This characteristic is related to the complexity of these goods as discussed above, which result in various use- and non-use functions. There are few goods and services that have a wider range of applications than water and water systems. This wide range of applications and functions is recognised in *NW4*. It can be stated that in the vast majority of cases in Dutch water management choices must be made with regard to the use of alternatively useable goods and services. Therefore, water and water systems (including the ecological component) in the Netherlands to a large degree fulfil this criterion for economic analysis and an economic policy approach. Besides, many other goods and services related to water management, such as public financial resources, land and space, also fulfil this criterion.

Rankeability

Rankeability is a subjective criterion, which depends on the preferences of the economic actor making choices. Individual economic actors may be able to choose on the basis of what they think various alternatives are worth to them (in other words, which commodities yield the highest utility). For public decision-making, methods have been developed to rank alternatives in an (somewhat) objective way. This ranking can be based on economic scores, but also on other types of scoring systems. In economic analysis, the ranking of alternatives is based on the economic value (the sum of costs and benefits) of alternatives. The scores of these alternatives with regard to economic value are usually determined by applying economic evaluation methods such as cost-benefit analysis. Logically, economic evaluations only yield economic data. Alternatives are thus ranked on the basis of costs and benefits expressed in monetary terms. In order for an economic analysis to include all effects of an alternative and to include all interests, all these effects and interests would have to be expressed in monetary terms. In that situation, the government can act as an economic actor basing decisions on complete information.

Due to reasons discussed before, both the ranking of alternatives based on economic information by individual economic actors and by public actors show considerable difficulties when natural resources are involved. Besides the magnitude of separate entries into an economic evaluation, there is often also a debate about the relative valuation of effects over time. This aspect, which is known as discounting, plays a large role in the discussion of sustainability, because of the way sustainability was defined⁵⁸. The discussion above showed that rankability is closely related to the availability of information and (thus) to the assumption of rational behaviour based on perfect information. Ideally, in public decision-making, personal preferences of decision-makers do not play a role in choosing alternatives. Besides, ideally, the actors providing information to these politicians do not manipulate this information for fulfilling their own goals either. In other words, ideally, decisions are based on objective data. The degree of objectivity of the data on which decisions are based is therefore an important aspect of decision-making, and a frequent point of debate. Besides, with regard to impacts on the environment and environmental quality, there is often a debate about the validity and dependability of the data. This aspect may therefore play an important role in discourse and will therefore be included in the empirical analysis of economic approaches to Dutch water management.

Clear definition of property rights

As was discussed earlier in this chapter, goods can be private or public in nature. Generally speaking, two types of public goods are distinguished: a *res nullius*, also referred to as 'public good', which belongs to no one (and thus to anyone) and a *res communis*, also referred to as common pool resource, that belongs to a specific, limited group of actors. Whether water and aquatic goods and services are private goods, a *res nullius* or a *res communis* varies widely, depending on the degree to which property rights have been defined. The degree to which this is the case is often not easy to determine. In some cases, it is not even possible to tell for a specific volume of water whether it is private or public. It is important to mention here that property rights can (even to a large degree) be defined by public policy. For example, the setting of emission standards defines property rights for using the environment for disposal of waste. There are two sides to this measure: one the one hand, they limit the amount of emission allowed, but on the other, they grant a 'permit' to emit polluting substances up to the level of the standard set. The amount of emission allowed depends on the policy paradigm adhered to regarding the man-nature relationship.

As was posed before, with regard to most commodities, it is better to speak of 'bundles of property rights' than of one property right defining to whom the commodity belongs. Three types of property rights were distinguished in chapter 2, being ownership, disposition and use rights. Some ownership, disposition or use rights may have been attributed to certain aspects of the water, but often, no one holds the exclusive property rights for a single water body. For example, a pond in the back yard of a house (which is private property) may be the private property of the owner of that back yard. However, this does not necessarily mean that the owner can do with the water whatever he likes. For example, he is not allowed to pollute it, or pump it anywhere he likes. Even a volume of water from the tap may not be fully owned by the person paying for it. The person may drink it, or water his plants with it, but he is not allowed to flush his apartment with it if this damages another person's

⁵⁸ For the dominant definition of sustainability, see WCED (1987).

property. In other words, property rights for water are often complicated sets of property rights that may vary per type of water body, per type of use, per country and per region. This complicates the allocation of water via the market mechanism. General speaking, it can be said that the property rights of water in the water chain are better defined than those of 'free water'. Later in this chapter, in the discussion of economic instruments for water management, I will show that various schools of economic thought have varying assumptions about and various ways of dealing with property rights.

Economic valuation

As was discussed in the section about rankability, comprehensive economic evaluation of alternative uses of goods and services requires that all effects (both positive and negative) of these alternatives be expressed in monetary terms (as benefits and costs, respectively). The degree to which this is possible for goods and services related to water is heavily debated, as will show from the discussion of an economic evaluation method in Dutch water management in the empirical part of this thesis. It can be stated that generally speaking, water management consists of decision-making regarding goods and services (not just water itself) the property rights of which are not always well defined, and the value of which is (thus) not or not properly represented by market prices. Therefore, economic value will often have to be derived from indirect indicators of value. The discussion about economic valuation of all effects of alternatives for public and private action is closely related to the concepts of total value and total economic value as presented earlier. If it is agreed that not all effects can be expressed in monetary terms, and that therefore an economic evaluation cannot be a comprehensive evaluation, the economic evaluation as such cannot contribute to integrated water management. It can do so only if it is part of a decision-making process in which a wider range of evaluation mechanisms is involved.

In conclusion

In several economic schools of thought, a role is reserved for economic approaches (making use of the market mechanism, steering the market mechanism, pricing, economic valuation) in balancing different interests in society (through efficient allocation of scarce commodities), including environmental ones. For example, neo-classical welfare theory focuses completely on achieving maximum societal utility from the scarce resources available. A balanced weighing of interests was also formulated as a key characteristic of integrated water management. This observation, combined with the conclusion that issues in Dutch water management are usually characterised by a situation of relative scarcity, may lead advocates of an economic approach to societal issues to argue that economic approaches are in principle very suitable for serving integrated water management. However, a lot of critique is uttered against such approaches as well. This critique is directed at the degree to which economic approaches actually serve *all* interests in society and the degree to which they do this *in the long-term*. These aspects were identified as important characteristics of integrated water management. The discussion of the degree to which issues in water management meet the preconditions of an economic approach showed that the main difficulties lie with the (incomplete) information available to economic actors about the costs (of damage) and benefits (of water and ecosystems) related to activities that have an impact on water systems and the degree to which property rights with regard to these natural resources have been defined. Both have an impact on the degree to which economic actors are able to make

rational decisions based on complete information. An important question for empirical analysis is whether or not the discourse about the use of economic policy instruments and evaluation methods does focus on the degree to which these instruments and methods fit in and contribute to integrated water management at all.

3.5 POLICY INSTRUMENTS AND EVALUATION METHODS FOR WATER MANAGEMENT

3.5.1 INTRODUCTION

So far, I have discussed economic policy instruments and evaluation methods as elements of policy largely as were they black boxes. In this section, I will discuss various types of economic instruments and evaluation methods in more detail in order to get a better understanding of what they look like and how they operate. The discussion of instruments and methods in this section is structured according to two categorisations. The first is the distinction between economic steering instruments and economic evaluation methods. The second is the distinction within the category of steering instruments between neo-classical (also referred to as centralistic or generic) instruments on the one hand, and instruments fitting new institutional policy arrangements on the other. I will start the discussion of instruments and methods with neo-classical instruments for environmental policy. The reason for discussing this category first is that these instruments have been applied in water management since the 1970s and were the type of economic instruments brought forward as alternatives for the command and control instruments for environmental and water policy, which were considered to have caused the implementation deficit. In that period, the belief in the 'manageability of society' was still very large, and therefore generic (or centralistic) policy instruments were commonplace and dominant in environmental policy. Attention for new institutional policy arrangements is of more recent date. The reason for focusing on economic instruments *for environmental policy* is that, besides making the value of nature for society more explicit, the incorporation of the effects of economic activities on the environment into (economic) decision-making is regarded in this thesis as an important point of attention in integrated water management.

The discussion of instruments for environmental policy will start with a short discussion of the various ways in which government authorities can in principle influence the behaviour of individuals in society through the use of various types of policy instruments (subsection 3.5.2). This is done to create an overview of the position of economic steering instruments in the total field of policy instruments and their theoretical impacts on behaviour. Then, a range of neo-classical economic steering instruments for environmental policy will be discussed that may be relevant for water policy and management (subsection 3.5.3). In the next subsection (3.5.4), arrangements based on new institutional economic theory will be addressed. As we will see from the empirical chapter, these types of arrangements have emerged as a consequence of shifting the focus in water quantity management from demand management to (spatial) supply management measures, combined with general trends towards privatisation, liberalisation and deregulation of public governance. Finally, I will discuss various methods for the evaluation of public projects (subsection 3.5.5). These include both economic evaluation methods, such as cost-benefit analysis and non-economic or combined

methods, such as environmental impact assessments and multi-criteria analysis. Again, the non-economic methods are included to discuss the position of economic evaluation methods relative to other types of evaluation methods. The discussion of steering instruments and evaluation methods is based on various scientific disciplines, and various schools of thought within these disciplines. As such, the content of this section can be regarded as consisting of scientific story lines that act as input for the struggle for discursive hegemony in policymaking. Therefore, this section relates mostly to elements (e) and (f) in figure 2.6.

3.5.2 INSTRUMENTS FOR ENVIRONMENTAL POLICY

As was mentioned in the introduction of this chapter, an important characteristic of integrated water management is the balancing of all the interests related to water management issues. Government intervention in societal processes in general and economic processes in particular, in principle aims at representing those interests that do not have access to or a strong position in society as a whole or the market in particular, respectively. One such 'interest' that is not automatically represented in interactions between private actors is the environment. As a result, the externalities of private interactions often (negatively) influence the quality of the environment. This subsection gives an overview of approaches available to public authorities to represent the 'public interest' of the environment via instruments for environmental policy.

According to Opschoor & Turner (1994: 8-9), in seeking to ensure sustainable use of environmental resources and the maintenance of stricter levels of environmental quality, environmental policy can in theory make use of (mixes of) two basic strategies (see Figure 3.2 on the next page, routes a and b, respectively):

- engaging in public projects and programmes aimed at preventing, compensating and eliminating environmental degradation or at providing substitutes for traditional behaviour patterns, such as: collective treatment facilities, environmental sanitation and (re)construction programmes, new forests, bicycle paths and railway lines (route a);
- influencing the decision-making process at the micro level, i.e., that of the environmentally relevant (economic) agents such as consumers, producers, investors (route b).

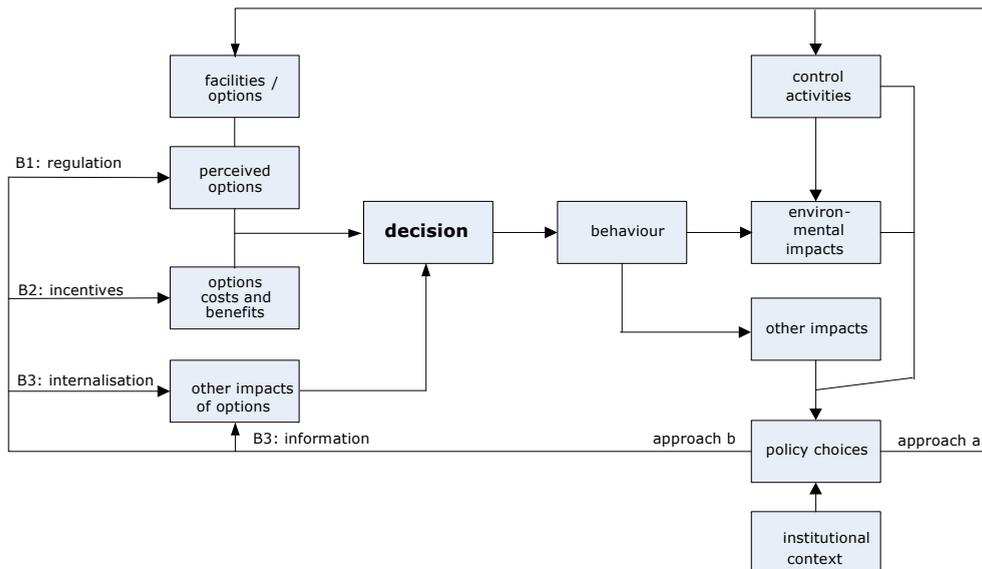
The economic aspects of the first strategy are discussed in section 3.5.5, the second strategy is discussed in the next subsection (3.5.3) and in subsection 3.5.4.

According to (neo-) classical economic theory, rational decision-makers will base their activities on a comparison of the various options open to them. They will compare the costs and benefits relevant to them, that each of these options presents. Costs and benefits here are taken to be generalisations of all (dis-)advantages relevant to the decision-maker as somehow aggregated by his/her individual weighting system. In such a situation, decisions can basically be influenced in three different ways (see figure 3.2, left hand side):

- b1): alteration of the set of options open to agents;
- b2): alteration of the cost and/or benefits relevant to agents;
- b3): alteration of the priorities and significance agents attach to environmental change (i.e. altering the structure of agents' costs and benefits and ranking criteria).

Route (b1) involves providing new alternatives or forbidding (or licensing) old ones. Instruments that fit this approach are generally referred to as *regulatory instruments* (RIs). Route (b3) entails approaches such as: education, information extension, training, but also: social pressure, negotiation and other forms of 'moral suasion'. Here, the mechanism involves realising a change of perceptions and priorities within the agent's decision framework, or, in other words, a full 'internalisation' of externalities within the preference structure of the agent. These instruments are referred to as *suasive instruments* (SIs). For a more extensive overview of instruments for environmental policy involving either of these routes, I refer to Russell (2001: 190) or Opschoor & Turner (1994). Route (b2) leads to the application of economic incentives or market incentives. The motivation relied upon here is that if environmentally more appropriate behaviour is made more rewarding (in a financial or economic sense) in the eyes of the agent involved, then attitudes and behaviour will 'automatically' shift in favour of these socially more desirable alternatives. Options can be made more or less (financially or economically) attractive by applying charges or levies, granting subsidies, implementing tax differentiation, granting soft loans, etcetera. Such instruments are referred to as *economic instruments* (EIs). Through these instruments, the environmental concerns can (in a certain restricted sense) be 'internalised' by altering the agent's context rather than the agent's value structure or preferences.

Figure 3.2: environmental policy approaches



The nature of a societal issue can be very decisive for the type of policy approach. In situations in which the attainment of specific goals is deemed necessary, regulatory instruments are likely to be preferred. This is for example the case with regard to hazardous substances that are judged very harmful for society or the natural environment. The policy goal will be to reduce the concentration of these substances in the environment to very low or zero values. A ban or strict emission standards combined with strong enforcement is more

likely in such a situation than are market-based instruments, since these instruments essentially leave the freedom of choice to the target group of policy. On the other hand, market-based instruments may be more environmentally effective with regard to pollution from diffuse sources of pollution. Usually, emissions with regard to this type of sources are very hard to monitor and control, simply because enormous public resources would have to be spent on these activities. A tax or a charge on the target substances may be more effective and efficient (require less resources for monitoring and control) in this situation, since these instruments are more difficult to evade. The choice of policy instruments thus depends on the type of policy goal and the way this goal is formulated, combined with the characteristics of policy instruments. It can therefore be imagined that the type of goal and the way the policy goal is formulated is an important factor in determining whether or not an economic policy approach will be chosen. Discourse regarding this goal is therefore an important element of empirical analysis⁵⁹.

3.5.3 NEO-CLASSICAL ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL POLICY

Economic instruments (EIs) can thus be regarded as instruments that provide *economic incentives* to economic actors inducing them to behave in an environmentally more appropriate or acceptable way. According to neo-classical economic theory, their merits include: effectiveness, efficiency, flexibility and incentives for innovation. Opschoor & Turner (1994: 11) state that, if properly chosen, they will ensure that enforcement efforts are minimal. In so far as they apply to sources of environmental degradation, EIs are considered more appropriate in a policy context that places priority on prevention than in a context that places priority on mitigation. The incentives provided may take the form of⁶⁰:

- direct alteration of price or cost levels;
- indirect alteration via financial or fiscal means;
- market creation and market support.

Direct alteration of price and cost levels occurs when, for example, charges are levied on products (product charges) or on the processes that generate these products (emission charges, input charges, feedstock charges), or when deposit-refund systems are put in operation. Indirect alteration takes place when, for example, direct subsidies, soft loans or fiscal incentives (e.g. accelerated depreciation) are provided to induce environmentally clean technologies; enforcement incentives (such as non-compliance fees and performance bonds) can also be put in this category. Market creation is often done on the basis of changed legislation or regulation, such as in the case of emissions trading and quota auctioning, as a consequence of limiting emissions or catches in a certain area, or insurance schemes in response to changed liability legislation. Market support occurs when public or semi-public agencies take responsibility for stabilising prices for certain markets (e.g. for secondary materials such as recycled paper or ferrous metal).

⁵⁹ For a more extensive discussion of considerations with regard to the choice of policy instruments I refer to section 6.3 and for example De Savornin Lohman (1994).

⁶⁰ For a discussion of characteristics and examples of these pathways, I refer to Opschoor and Turner (1994).

For each of these categories of incentives, Opschoor & Turner (1994) discuss the situations in which these instruments operate best, what are their limitations and obstacles for implementation and what are their perspectives for application in water management. For this discussion, I refer to these authors.

Assumptions about the usefulness of economic instruments for environmental policy

Economic policy instruments (EIs) are often ascribed a number of characteristics that would make them theoretically suitable for environmental policy. Proponents of economic instruments argue that they are theoretically superior to regulatory instruments in a number of respects. According to these proponents, there are several rationales for using EIs, *inter alia*:

- charges/subsidies may be used to correct for market price distortions due to government failure (for example as a consequence of the application of regulative instruments) to effectively impose the internalisation of environmental maintenance and replacement costs. This statement involves 2 rationales, namely solving the implementation deficit on the one hand and effective and efficient internalisation of environmental costs on the other;
- they may be used to provide behaviourally relevant incentives to polluters and resource users in order to arrive at some allocative optimum;
- they may be used to provide funds for public or private investment schemes or environmental programmes;
- they are being advocated (increasingly) as an appropriate base for general taxation (to replace schemes based on income, profit, or value added) in situations where environmental quality and natural resources have become scarcer means of production than labour or man-made capital.

(Opschoor & Turner, 1994: 11 a.f.)

The (assumed) characteristics and effects of economic instruments are summarised and explained in table 3.2 below.

Table 3.2: characteristics of, criteria for and assumptions about (economic) instruments for environmental policy

Characteristic	Description/Assumption
altering agents' cost/benefit analysis	alteration of the costs and benefits of (one or some of) the alternatives presented to an agent in a decision-making process
effectiveness	the degree to which the policy goal for which the instruments are used, is achieved
efficiency	static aspect: lower administration costs dynamic aspect: lower costs for achieving (environmental) technological innovation/diffusion
flexibility	more flexible than regulatory instruments (leaves choice how to achieve goal to economic actors)
full cost recovery	recovering all the costs of management (including environmental costs)
incentive	modifying behaviour, objectives, institutional arrangements incentive for (environmental) technological innovation/diffusion

information	using the market mechanism for revealing information. This leads to efficient exchange of information.
integration	integrating environmental policy into other policy domains (making environmental policy and implicit part of other domains)
internalising externalities	environmental economic instruments are presumed to incorporate aspects that were previously left out of the decision-making process
preventative	economic instruments are presumed to be more in line with a preventative approach than Command And Control (CAC)-instruments

(Based on: Opschoor & Turner (1994: 11 and further))

A number of the elements of the table will be discussed more extensively below, since they are expected to play a role in the discourse about the application of economic steering instruments:

- The *effectiveness* of economic instruments for a major part depends on the price-elasticity of the good or service addressed. Environmental economic policy instruments are often criticised with regard to this aspect, since many environmentally adverse activities and goods show relatively low price-elasticity. In these situations, the EI may be regarded by opponents as an instrument for raising public revenues only, and for that reason be objected to;
- The *efficiency* of EIs has two dimensions, namely the static and the dynamic dimension. The static aspect refers to the administration costs related to the instrument. On theoretical economic grounds, economic instruments are expected to lead to efficiency in governance, since market institutions already regulate the major part of the allocation of goods and services, and public authorities only have to 'slightly' steer this process. In other words, public authorities do not have to expend major costs for the construction of the required institutional framework for the allocation of goods and services. The dynamic aspect refers to the costs related to achieving technological innovation and diffusion. The reason that economic instruments are expected to lead to more efficient innovation and diffusion is that economic instruments, contrary to CAC-instruments, provide a continuous incentive to target groups to improve the environmental performance of their activities. This continuous incentive is usually referred to as 'dynamic incentive';
- EIs are usually thought to be more *flexible*, since they only give a signal to target groups regarding which activities are desirable and which are not. For the rest, these instruments leave the choice whether or not to respond to this signal up to the target group. Therefore, it is argued, target groups can choose themselves for the best way to respond to the signal. This is also expected to lead to cost-effective or efficient solutions for environmental problems;
- EIs are believed to come closer to *full cost recovery* than SIs or CACs, since because of the dynamic incentive (see 'efficiency' above), these EIs make target groups include all the costs made for producing or consuming goods and services, including those of environmental degradation. Besides, SIs and CACs do not, or only marginally, yield income for public policy. EIs providing a negative incentive do. EIs also in principle have a fair relationship between the achievement of environmental goals and the height of tax revenues. If the height of the incentive is dynamically related to the gap between actual behaviour and desired behaviour (i.e. the degree of environmental pollution), getting

closer to the environmental goal will result in reduced tax revenues. In economic terms, EIs are often based on variable instead of fixed costs.

- EIs are expected to provide economic actors with *information* about the (true) costs and benefits of goods and services via the price signal. This mechanism for communicating information about goods and services is expected to be more efficient than through public information campaigns;
- By including environmental costs and benefits into the cost-benefit analysis of economic actors, EIs are expected to lead to an 'automatic' integration or *internalisation* of environmental policy into other policy domains. Using other instruments (SIs or CACs) for this purpose is expected to require higher efforts and (thus) higher costs;
- Finally, economic instruments are expected to *prevent* environmentally adverse behaviour instead of mitigating or compensating it. CACs typically punish environmentally adverse behaviour the moment it has already occurred.

As shows from the discussion above, economic policy instruments have a substantial range of theoretical advantages over other types of policy instruments. The questions with regard to economic policy instruments in this thesis are what the discourses look like with regard to the questions whether or not the criteria set by economic theory (see earlier this chapter) can be met in the case of (Dutch) water management, whether or not the criteria set by 'integrated water management' can be met by using economic tools and instruments in water management, if meeting the criteria set by 'integrated water management' play a role at all, and whether or not the presumed advantages of economic instruments for (environmental) policymakers can be found in practice. With regard to the first two questions, comments can be given based on both theoretical insights and empirical analysis of practical obstacles. The latter two questions can only be assessed through empirical analysis.

3.5.4 GOVERNANCE BASED ON NEW INSTITUTIONAL ECONOMIC THEORY

INTRODUCTION

In this section, I will discuss theory about incomplete contracting and options for application of incomplete contracts in Dutch water management. For the moment, the use of contracts can be seen as a 'tailor-made' alternative for the more generic neo-classical economic instruments as discussed in the previous subsection. By tailor-made, I mean that these contracts can be designed for one specific situation, usually on a regional or local geographical scale. This contrasts with the EIs discussed so far, which apply to an aggregate category of situations or actors, especially if they are based on laws. Laws in principle are not allowed to discriminate between groups of actors in society. Therefore, (in this thesis) taxes, charges and subsidies will be referred to as centralistic or generic instruments, while the arrangements based on contracts will be referred to as decentral(-ized) instruments. Arrangements involving contracts are considered in policy as a potentially preferable alternative to centralistic instruments with regard to a number of issues in water management. Before addressing the advantages of these arrangements, I will give an overview of theory about contracting. Most theory about contracting deals with exchange between (private) economic agents. However, contracts can also be settled between public

and private parties, and as such can operate as a policy instrument. In this situation, the public party is the principal and the private parties are agents. The terms principal and agent are common notions in new institutional economic theory. The principal-agent relationship entails specific characteristics that will be discussed later in this section.

THE RISE OF CONTRACTING THEORY

Gustafsson (1998: 273) suggests that environmental policy in the foreseeable future should not expect too much from the market mechanism, but rely more on political-administrative mechanisms, bargaining, agreements, legal enactments and education. As will show from the empirical chapters, a trend can be observed in present day Dutch water management towards these types of arrangements. This trend can for some part be explained by a shift in attention in water management from integrating the policy domains of water and environment (which in theory allows for generic economic instruments for environmental policy) to the integration of water and spatial planning (which may be more location-bound)⁶¹. Another factor causing attention for these arrangements are the general trends in governance towards deregulation, privatisation and liberalisation. In this section, I will explore the theoretical background of contracts between public authorities and private actors for services provided by these private actors to achieve policy goals in water management. Since this instrument is relatively new in water management, at least for the presently intended field of application, not much experience exists with the instrument. Therefore, the review of applications of the instrument in this chapter predominantly contains examples from a related policy domain, namely nature management.

WHAT IS A CONTRACT?

Literature about contracts related to nature conservation or environmental protection is not very generous in providing a definition of the concept. In his discussion of institutions according to new institutional economic theory, North (1990: vi) defines institutions as 'any constraint humans device to shape their interactions'. With regard to formal institutions, he makes a distinction between political (and judicial) rules, economic rules, and contracts. According to North, the hierarchy of such rules, from constitutions, to statute and common laws, to specific bylaws, and finally to individual contracts, defines constraints from general rules to particular specifications (idem: 47). Contracts, according to this description, can therefore be interpreted as 'constraints to shape interactions between actors for specific situations'. In line with this, economic contracts can be defined as 'constraints regulating economic transactions for specific situations'. Contracts form the basis for economic transactions. Contrary to classical economic theory, which assumes contracts to be complete, neo-classical and new institutional economic theory do not (automatically) assume completeness of economic contracts. These schools of economic thought study contracts for transactions that are too complex to be regulated via complete contracts. They argue that complete contracts only apply to market transactions of standardised goods with perfectly defined property rights. Classical economic theory on the one hand and neo-classical and new institutional economic theory on the other thus differ in basic assumptions about the

⁶¹ For a discussion of this trend, see subsection 1.4.2. and the empirical chapters four and five.

allocation of commodities via markets and as a consequence (partly) address different types of commodities and markets. The various types of contracts and the different starting points about contracts in various schools of economics will be discussed in more detail below.

Williamson (1979, 1984, 1990) identifies three forms of contractual relations that are influenced in part by uncertain information and frequent exchanges – classical, neo-classical and relational contracts. Although Williamson concerns himself with intermediate products, his work applies to natural resource problems as well (Edwards, 2003:313). Standardised commodities that are familiar to all parties and that are relatively inexpensive (such as movie tickets or seafood) lend themselves for divided ownership and *classical contracts* with market exchange. In contrast, *neo-classical (incomplete) contracts* apply to resources that are too complex for a simple market exchange and to situations in which occasional and unpredictable exogenous events alter resource value. Ownership can be divided in these circumstances because exchanges are infrequent, but a third party may be needed to resolve new (or exacerbated) spill-overs or attribute values as they appear in the public domain. Finally, a high degree of uncertainty and frequent exchanges favour long-term *relational contracts*. In this case, production is unified within a single organisation that has internalised the costs of exchanges. A regulatory government agency, a commons or co-operative with decision rules which are designed to resolve use conflicts (Runge, 1986, Ostrom, 1990), or a corporation that centralises production decisions (Coase, 1960; Demsetz, 1964) are general forms of relational contracts and unified governance arrangements (Edwards, 2003, 313).

This section is concerned with the second form of contracting. With regard to these contracts, some additional comments can be made. By calling this form of contracting neo-classical contracts, Edwards implies that this type of contracts is or should be predominantly analysed through neo-classical economic theory. There are, however, several schools of thought that address this form of contracting. In a contribution to Ménard (2000), Brousseau and Fares discuss three of these schools, namely transaction cost theory (TCT, or 'transaction costs economics', TCE), incomplete contract theory (ICT) and new institutional economics (NIE). The stated objective of incomplete contract theory (ICT) was to explain authoritarian co-ordination in an 'enlarged' neo-classical framework. Whereas incomplete contract theory thus endorses the hypotheses of neo-classical economics, transaction cost theory and new institutional economics that resulted from it do not. These latter schools of economic theory would therefore object to calling the category of incomplete contracts 'neo-classical contracts'. New institutional economics (NIE) can be regarded as an enrichment of Williamson's transaction cost economics with complementary analyses of transaction costs to become a theory of governance structures and institutions (see for example North, 1990; Williamson 1996). New institutional economics and transaction cost theory do not take the institutional framework as given (i.e. as an exogenous factor), as do (neo-)classical economic theory and ICT, but instead aim to analyse the required framework for a specific purpose and compare it with the existing framework, in order to be able to facilitate a shift to towards the desired state.

In an article presenting a model of non-standard contracting, Leitzel (1989) states that a contracting approach is general, in that virtually any transaction can be viewed as being governed by an implicit or explicit contract. Williamson (1985) suggests three conditions that are jointly necessary for the existence of non-standard contracting problems. They are (1)

bounded rationality, (2) opportunism, and (3) asset specificity. Bounded rationality, which from some perspectives may be interpreted as the contention that information is costly, means that complete contingent contracts of the Arrow-Debreu type⁶² (see f.e. Arrow and Debreu, 1954) are not feasible. 'Opportunism' centres around the notion that people take actions that are in their own best interest, regardless of the impact of those actions on others. When some assets are more highly valued within a given contractual relationship than they are outside of that relationship, asset specificity is said to exist. In other words, the contract gives added value to the asset. Other important aspects of transactions are uncertainty and the legal environment. Uncertainty is efficaciously handled in the Arrow-Debreu framework via complete contingent contracts. However, bounded rationality makes this solution infeasible in the New Institutional World, creating a demand for alternative structures to deal with uncertainty (Leitzel, 1989:76).

COLLECTIVE AND INTER-INDIVIDUAL GOVERNANCE

According to new institutional economic theory, agents design incomplete contracts that do not implement an *ex ante* designed complete set of behavioural rules that will *ex post* solve all co-ordination problems. They rather design decision-making devices that *ex post* will indicate the behaviour required by contractors to ensure efficient co-ordination and to guarantee the enforcement of mutual commitments. In that sense, they fundamentally differ from (neo-classical) generic steering instruments. The decision-making device can be one of the contracting parties (this is the case in hierarchical governance structures), a negotiation structure (as in many hybrid forms) or a third party. In most co-ordination mechanisms, there is a mix of *ex ante* designed rules and authority. Decisions, and therefore decision devices, are required when the *ex ante* designed set of rules of mutual behaviours is not applicable (because it does not correspond to the present state of the world) or is inefficient (Brousseau and Fares, 2000: 410).

Inter-individual governance structures (IGSs) are set up by agents to complete the incompleteness of *ex ante* set contractual obligations and ensure their self-enforcement. However, the theory of new institutional economics acknowledges that the function of governing the transactions is never completely performed by these IGSs (Williamson, 1985, 1996; North, 1990). Put another way, the governance of inter-individual transactions is performed both at the bilateral level by an IGS and at a collective level by institutions. IGSs and collective institutions are thus complementary means of co-ordination and agents balance the advantages of the two in their effort to reduce transaction costs. Collective governance makes it possible in some cases to economise on governance costs. However, NIE states that the collective governance that is exercised by institutions is incomplete and imperfect (North, 1990). There are three main reasons for this incompleteness and imperfection. First, institutions are partly unintentionally designed to perform the governance

⁶² The Arrow-Debreu type of contracts are contracts between economic actors operating in an idealized mathematical model of a frictionless capitalist economy. According to opponents of this model, the assumptions of this model are unrealistic, and therefore empirical situations usually do not show the characteristics as assumed by this model. According to some critics, the model even contains structural errors (see for example Ellerman, year unknown (source: http://www.ellerman.org/Davids-Stuff/The-Firm/ad_mod3.doc)).

of economic interactions (i.e., they are primarily designed for other purposes). Second, institutions are designed and run by agents whose rationality is bounded. Therefore, these agents are not able to design and operate a set of institutions that is applicable to all possible situations. Third, institutions are necessarily geared to the lowest common denominator shared by a set of transactions. Therefore they cannot fit perfectly the specificities of each relational situation (misadaptation costs). As a result, some governance has to be exercised at the inter-individual level by IGSs in an attempt to complete the incompleteness and correct the imperfection of collective governance. The distinction between collective institutions and inter-individual governance structures can be an important one in the characterisation of institutions in empirical situations. The specificity of an IGS may be used as an argument to plea for an arrangement involving an incomplete contract approach as opposed to a (supposed complete) generic instrument.

PUBLIC-PRIVATE CONTRACTING IN ENVIRONMENTAL MANAGEMENT

The conditions as previously suggested by Williamson seem to hold for contracts in environmental management, including water management. If interpreted as the contention that information is costly, bounded rationality is certainly applicable to environmental management. The effects of economic activities on the environment are often not or only partly known, which makes it impossible to make decisions based on fully rational grounds. The condition of opportunism is also applicable to environmental management, since many activities in the economic realm are still undertaken regardless of the impact of those actions on others, including the environment. This situation may be caused either by lack of information or by conscious neglect. The third condition (asset specificity) can also be claimed to hold. In many cases, nature or the environment is not given an explicit value in economic transactions. In other words, any effects of these transactions on nature or the environment are external to these transactions. However, as will be shown in the empirical chapters, both public and private parties can have an interest in 'environmental quality', including the quality of aquatic ecosystems and good water management. In such a situation, a public-private contract may be constructed. An example of asset specificity for both public and private goods in this situation is when private use functions, for example of water or land, may only be realised if certain public use functions are realised as well via a *sine qua non*-construction, either or not financed by the private use functions. Examples of such public-private contracts will be discussed in the empirical chapters.

CHARACTERISTICS INFLUENCING THE APPLICATION OF PUBLIC-PRIVATE CONTRACTS

Several forms of public-private contracts can be distinguished. Usually, the characteristics of the contracts vary with situation specific factors. In the case of forest protection in Austria, Frank and Müller (2003) indicate that nature protection measures can be based on private law contracts. These contracts are voluntary agreements between the responsible nature protection authorities and the owners of areas, which are designated as requiring protection. The owners commit themselves to abstaining from further development of the areas in another way than nature management or to taking clear actions to manage the areas in a way that is suitable to reach the goals of protection. For these abstentions or active

measures, a compensation fee is calculated and agreed as part of the contract. This type of nature management contrasts with nature protection by decree, which allows the declaration by public authorities of specific habitats to become protected area by law even without consent of the landowner.

One of the consequences of the philosophy of a strictly voluntary programme is that it is not clear which areas and how many areas, sites and forest types are and will be covered by the programme (Frank & Müller, 2003:268). As a consequence, this type of nature management entails a degree of uncertainty with regard to the effectiveness of nature management policy. Therefore, this approach seems to be less suitable for situations in which the realisation of specific policy goals depends on assigning a specific purpose to a specific area. In nature management, this can be the case with areas that are designated as part of the EMS. In water management, for example, this can be the case with measures that are deemed crucial for protection against live threatening floods, such as river floods or sea floods, or the acquirement of patches of land that are deemed crucial for establishing an uninterrupted aquatic ecological zone.

ADVANTAGES AND SUCCESS FACTORS OF CONTRACTS

In a discussion about biodiversity conservation, Faith mentions an important advantage of contracts between public authorities and private landowners for public policy as compared to one-sided public action. Because contracts do not imply outright purchase of the land (but instead only a change in management) there are no obvious costs such as land purchase prices (Faith et al., 2003:315). In terms of property rights, public authorities do not have to acquire the ownership rights in order to acquire specific disposition and/or use rights. Top-down approaches often used to obtain private areas under protection, such as juridical or administrative regulation or compulsory purchase of land, have been criticised for their inefficiency and lack of flexibility (Tikka, 2003:271). Rekola et al. (2000) states that securing landowners' property rights may be a very important issue, which may be a reason for resistance to compulsory purchase of land for protection, as well as implementation of top-down regulation of any kind. In cases where property rights of private landowners are considered very important (as may for example be expected with regard to farmers), voluntary conservation contracts may thus be a feasible option.

Stoneham et al. (2002b) acknowledge that providing information about environmental values promotes conservation investments. Based on this knowledge, Faith et al. (2003) introduced a scheme in which the value of a nature area is based on its relative contribution to achieving goals in nature management. As such, a market is created for nature management. In such a scheme, investment in or purchase of land, the management of which is regulated in a contract, can turn into a profit if that area's complementarity value increases (say, because similar land elsewhere loses its biodiversity values through destructive land-uses). Drawing a parallel with assigning areas for water management measures, through the settling of public-private contracts, the loss of value usually associated with assigning (agricultural) land for water management measures, may be converted into a value gain for private landowners. This might be the case for example for conservation of aquatic ecosystems, the value of which is expressed in dynamic complementarity values. In other words, arrangements that make the value of water explicit

may become profitable for (private) participants, instead of decreasing the value of the land involved.

Other advantages of local water management measures based on public-private contracts are the fact that individual contracts allow water management to be tailor made to the local situation. Besides, these contracts are expected to be easier to monitor and control than broad sweep economic instruments, since the distance between principal and agent is usually smaller, and they are more based on voluntary co-operation, which (supposedly) enhances stakeholder support for water management. This may be an important advantage of the public-private contract-approach as compared to centralistic steering instruments, in which private actors (target groups and other stakeholders) are involved in the decision-making process about the arrangement in a later stage or not at all. As a consequence, there may be no support for the arrangement. Arrangements involving public-private contracts are often based on the voluntary co-operation of private actors. Besides, in many cases, the involvement of private actors is pivotal for the success of an arrangement. Therefore, the early involvement of private actors in the decision-making process is a strong precondition for the success of such arrangements..

SOME ISSUES IN DESIGNING CONTRACTS AND FACTORS FOR FAILURE

Establishing the amount of compensation

In the case of forest protection in Austria as presented by Frank and Müller (2003:264), the basic idea of the compensation remuneration is that its amount has to reflect the income value the forest owner could earn alternatively from his property. The costs of income from alternative use of the property forgone because of its current application are usually referred to as opportunity costs of capital. This basic idea could also be applied to compensation of landowners in the case of water management measures. However, establishing the value of opportunity costs is often not an easy task. One of the major difficulties in this process is asymmetry of information between principal and agent. This issue will be addressed below.

Asymmetric information problem

Stoneham et al. (2002): 315) treat the problem of designing contracts that are to minimise the costs of achieving a conservation target. They state that to minimise costs, the government needs to overcome the asymmetric information problem. In their studies, the key asymmetric information problem is that the landholders know more about their cost to provide conservation, and the government knows more about the actual conservation values of the land. That is to say that the government has more (aggregate) information about the contribution of a particular area to the realisation of the policy goals served by that area, or about the value of the nature area for other actors than the landowner. To overcome this information problem for the public authorities involved, Stoneham et al. (2000) suggest the introduction of some sort of competition between landowners to offer management services, in order to get a better idea about the opportunity costs of capital, and thus about the price to be paid for the services offered. For this purpose, the authors recommend the introduction of auctions (which was discussed earlier as government intervention via 'market creation'). For water quantity related measures, introducing competition between landowners may not always be an option. The reason for this is that in order to be effective, these measures will

often be location bound. This counts especially for (spatial approaches to) flood protection and to a lesser extent for water retention for building reserves. In water quality management, the result attained may also depend on the joint effort of landowners and users, instead of extra measures taken by a single or small number of owners and users. In these situations, benchmarking of arrangements may be a better way to establish the right terms for a public-private contract, especially with regard to the financial compensation of the private party/-ies.

Many agents may be unwilling to follow the principal's preferred set of conservation actions for a number of reasons. Firstly, it may impose an economic cost on them to do so. Furthermore, the agent may belong to an organisation that has multiple objectives and for which conservation work would conflict with some of these alternatives. Finally, long-term projects tend to be systematically biased against. When translated to water management, it can be expected that arrangements for water quality management are more to suffer from the principal-agent problem than are arrangements for water quantity management. The reason for this is that in the former, the success of the policy depends more on the activities of the agent. In the latter, it is often still the water manager (the principal) that takes actions that determine the effectiveness of the measure (i.e. of the contract). For a more detailed discussion of the principal-agent problem, I refer to Stiglitz (1987) and Moyle (1998).

MOTIVES OF PRIVATE ACTORS

Several kinds of incentives can be introduced to make private actors co-operate with conservation contracts. In a discussion of the economic and social factors related to conservation contracts, Tikka (2003: 276) states that besides benefits from compensation, landowners can receive other monetary benefits (via public incentives) as well. In Finland, establishing a nature reserve on forestland exempts the landowner from acreage taxation of the protected forest stand (see Kiviranta, 1997), while exemption from real estate taxes comes into play on certain habitat types of low productivity (Viherkenttä, 1993). Besides monetary motives, landowners may also have non-monetary motives for the establishment of a nature reserve. According to Karppinen (1998), the majority of Finnish forest owners appreciate also non-timber, recreational and amenity aspects of their forests. Protection without payment may thus reflect willingness of landowners to secure the non-material and aesthetic values of their forests also in the future.

Whether the same motives for co-operation with public-private management contracts apply to landowners in the case of water management measures probably depends on the function of the land at stake, and the impact of the water management measure on that function. In case of agricultural land, voluntary measures by the landowner without considerable compensation are probably not to be expected, since the land often is the landowner's primary source of income. Therefore, the opportunity costs of capital are high. Besides, farmers are not very likely to have non-monetary motives for co-operation, such as recreational and amenity aspects of wetlands. For landowners who are not willing to engage in a public-private management arrangement, the cultural or emotional importance of landownership and intentions to utilise their land economically in the future are central arguments (see for example Karppinen and Hänninen, 2000; Sairinen, 2000). Antipathy against management arrangements based on contracts, even if it may yield higher benefits

for the landowner than its present use, may be interpreted as loss aversion, which is the tendency of an owner of a good to overestimate its monetary value (in this case of the present use of the land) and as a consequence the tendency not to transfer the property rights of that good (Tversky and Kahnemann, 1991). Besides, farmers may have moral objections to converting arable land into nature or water storage areas. A likely reason for this is that water is often regarded as 'the old enemy'. Many landowners or inhabitants are therefore not likely to 'lend' their land for water management activities, if this means their land is 'sacrificed' to water. However, according to Vehkala and Vainio (2000), even statutory conservation tools (i.e. public-private contracts) may become somehow acceptable for landowners if compensation sums are high enough.

THEORETICAL SCOPE OF APPLICATION OF CONTRACTS IN DUTCH WATER MANAGEMENT

As we have seen previously, a contracting approach is general, in that virtually any transaction can be viewed as being governed by an implicit or explicit contract (see Leitzel, 1989). Williamson (1979, 1984, 1990) gave structure to the concept of contracting by presenting three forms of contractual relations: classical, neo-classical and relational contracts. In water management, transactions on the basis of classical contracts may exist for the supply of bottled drinking water, since this good is to a large extent standardised. Besides, the good can be said to be relatively inexpensive. For tap water, transactions will not occur on the basis of classical contracts, since the supply side of the exchange does not meet the requirements of free entry and exit to exchange and the requirement that the number of traders must be large to ensure competition, since (at least in The Netherlands), suppliers of tap water have a regional monopoly. Therefore, the number of goods and services related to water that can be exchanged on the basis of complete contracts is very limited. In contrast to this, many transactions in water management meet the characteristics of (incomplete) neo-classical or new institutional contracts, as a consequence of the situation that 'resources are too complex for a simple market exchange' and/or the situation that 'occasional and unpredictable exogenous events may alter resource value' (Williamson, 1979). These situations especially apply to all 'free' water (surface and ground water). This free water is far from a homogenous good, and therefore, in most situations, the resource is 'too complex for simple market exchange'. Besides, the value of water changes continuously because of 'occasional and unpredictable exogenous events' (idem). Examples of these occasional and unpredictable exogenous events are spills deteriorating water quality, variations in weather, causing drought or floods, and changing relative appreciation of different water uses due to social, political, economic or scientific developments. The final category as presented by Williamson, long-term relational contracts, is not addressed in this thesis.

3.5.5 METHODS FOR EVALUATION OF PUBLIC POLICY AND PROJECTS

INTRODUCTION

As was discussed earlier in this chapter, basically, public authorities can make use of two types of mechanisms to change the structure of allocation of goods and services in society: influence the behaviour of (private and other public) actors via steering instruments (CACs, SIs or EIs) (route b in figure 3.2), or provide for certain goods or services themselves (route a in figure 3.2). In this thesis, route a) is referred to as public projects, route b) as government intervention. Both approaches can be subject to *ex ante* or *ex post* evaluation. Evaluation of public initiatives (both intervention and projects) can relate to a range of effects, such as ecological, economic, environmental, cultural and social effects. For the purpose of evaluating these (various) effects, various methods (or tools) for evaluation have been developed. Basically, the choice of evaluation methods depends on two considerations: which effects are to be evaluated, and which method(s) is/are most suitable for this purpose. This section will discuss economic and non-economic evaluation methods and methods combining economic and non-economic evaluation, addressing methods for both public policy programmes and public projects.

In this thesis, the focus with regard to evaluation methods is on methods for economic evaluation of public initiatives for water management. These methods serve the purpose of assessing the economic effects of public activities affecting the quantitative and/or qualitative state of these water systems. Examples of such economic evaluation methods are cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA). This type of methods can be applied at various levels of policymaking. For example, at macro-economic level, the consequences of policymaking and the effects of economic activities on society as a whole (amongst others via their effects on water systems) can be analysed by means of national accounts. At project level, methods for economic evaluation can help assess the consequences of certain proposed or executed projects or programmes of measures in economic terms. Since methods for economic evaluation of policy programs are not addressed in the empirical part of this thesis, they will not be discussed in detail here. For a detailed description of the theoretical aspects of such methods, I refer to Boot (2003), and for a discussion of their applicability to Dutch water management, I refer to Schuijt et al. (2001).

METHODS FOR EVALUATION OF PUBLIC INFRA-STRUCTURE PROJECTS

A large number of methods exists to evaluate the effects of public projects. As was mentioned before, with regard to these methods, a distinction can be made between economic, non-economic and combined evaluation methods. With regard to the appraisal of large infrastructural projects, a trend can be observed towards a holistic approach. This means that increasingly, attempts are made to evaluate all effects of projects on society as a whole, including the environment. This trend has led to a substantial broadening of the variety and scope of assessment tools, some of which aim to extensively evaluate the effects of the project on one of these aspects (such as the environmental impact analysis (EIA) for

effects on the environment), while others aim to evaluate all effects involved through one tool (such as multi-criteria analysis (MCA) or socio-economic cost benefit analyses (SCBAs) or ecosystems-oriented (eco-CBAs)), each with its own emphasis. These tools and their relationships will be addressed below.

Non-economic methods for project evaluation

Non-economic methods for project evaluation are methods that analyse the effects of projects (or project alternatives) in non-monetary terms. This may involve data expressed in both qualitative and quantitative units and may even address 'economic' effects, when not expressed in monetary terms. Examples of non-economic evaluation methods are the socio-economic effect-matrix, the social impact assessment (SIA; *sociaal-maatschappelijke effect rapportage*) and the environmental impact assessment (EIA; *milieu-effectrapportage (m.e.r.)*). The socio-economic effect-matrix is a qualitative assessment of socio-economic effects of policy measures and public projects. The social impact assessment can be seen as a first step in an integrated project evaluation and is comparable to the economic impact assessment. The environmental impact assessment (EIA) is widely used in The Netherlands for the evaluation of environmental effects of large infra-structural projects. Criteria for the process and content of an EIA are stipulated by law (Van Mierlo et al., 1997: 15). The EIA aims to assess the effects of projects on nature and the environment, but does not balance these effects against other types of effects and/or interests (Eijgenraam et al., 2000: 13).

Economic methods for project evaluation

Economic methods for project evaluation are defined as methods that analyse the effects of projects or project alternatives in monetary terms. Examples of economic evaluation methods are cost allocation procedures, cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), incremental cost analysis, life cycle costing (LCC), market analysis, competition analysis and economic impact assessment. Each of these methods has a different purpose. Market analysis and competition analysis are usually restricted to the private domain, and generally speaking are not very relevant for economic evaluation of public projects. Cost allocation procedures have the purpose of allocating the costs of an activity (such as a large public infrastructural project) to different stages of a project. The purpose of cost-effectiveness analysis and incremental cost analysis is to assess whether or not a predetermined goal is achieved in a cost-effective way. Although the latter two are (increasingly) being used in public policy evaluation, they concentrate exclusively on costs, and often only on a specific part of the costs, namely the direct financial costs of the programme for public authorities. Therefore, they cannot be regarded as integrated evaluation methods and are not likely to make a (substantial) contribution to integrated water management when used independently, except for the aspect of dealing efficiently with scarce public financial resources.

The purpose of life cycle costing is to map the (societal) costs of a product during its total lifespan (Maas & Jantzen, 1999). This way, insight can be gained in the distribution of (financial and external) costs of a product in the various stages of its life cycle. Economic impact analysis is a method that in principle is very suitable for economic evaluation of public projects. In fact, it is often used for large projects in Dutch water management. However, it is not an integrated evaluation method in the sense of evaluating the economic impact on

society as a whole, but rather an analysis of the (direct) economic effects of a project. As such, it can be seen as a method that generates input into more comprehensive methods, such as societal cost-benefit analysis (SCBA). As a method for economic analysis, economic impact analysis is comparable to the economic analysis at the level of river (sub-) basins as stipulated in the European Water Framework Directive, which aims to evaluate the effects of economic activities on water systems and the price and value of water for economic activities in that river (sub-) basin (see chapter 4). This economic analysis serves as input for decision-making about economic aspects of water management.

The only method that in principle allows for inclusion of both negative (costs) and positive (benefits) economic effects of a project is cost-benefit analysis. Therefore, this method is the potentially most comprehensive of all economic evaluation methods (see also Boot (2003)). However, the degree to which various effects are included in this evaluation, and thus the degree to which this method is truly comprehensive, depends on decisions about its technical design and the types and range of effects that will be expressed in monetary terms. This in turn depends for a large part on the available resources to execute valuation methods, since some effects can be more easily expressed in monetary terms than others⁶³. Since the CBA is the potentially most comprehensive evaluation method, it also has the highest potency to contribute to integrated water management. Therefore, this method will be discussed separately and more extensively further below. This discussion includes a number of heavily debated aspects of this method.

Combined methods

Besides economic evaluation methods and non-economic evaluation methods, combinations of both exist as well. In project evaluation, economic and non-economic evaluation methods are often combined and tuned. In case this is done in one single method, according to Grigg (1996), one can speak of an integrated evaluation method, in which economic data are given the same weight as other types of data, such as ecological, sociological and hydrological data. According to Bijlsma (1988), effective multi-functional, ecologically compatible integrated water management requires different types of supportive research, both mono-disciplinary (such as economic and ecological) research and integrated model-studies (such as risk-analysis).

Examples of integrated evaluation methods are scenario-analysis, societal multi-criteria analysis (SMCA) and regular multi-criteria analysis (MCA). Scenario-analysis is a method to assess the effects of various (complex) project alternatives, often in the light of various external factors. Scenario analysis is particularly relevant in situations in which above mentioned external factors, relationships and effects cannot be assessed unambiguously and therefore entail large uncertainties. Uncertainty is common in decision-making processes about large and complex projects, the effects of which extend over a long period. Such a situation applies to the Rivierenland-study, which will be analysed in chapter 5. Eijgenraam et al. (2000) point at the importance of clear scenarios for performing economic evaluations. Multi-criteria analysis is a method for comparing project effects that cannot all be expressed in the same unit. In this method, efforts are made to quantify as many effects as possible, but in case not all effects can be described in the same unit, effects described in qualitative

⁶³ For a discussion of crucial factors influencing the role and content of CBAs, I refer to Schuijt (2003).

terms, monetary units and other quantitative units will be compared and ranked based on a weighing factor. Ranking takes place on the basis of methods like expert-judgement, political preference or societal consensus. A special type of MCA is the societal multi-criteria analysis (SMCA). With this type, the emphasis is on the societal feasibility of a project. The ranking of different types of effects is based on the combination of the magnitude of effects in absolute terms and the relative societal importance attached to various types of effects (Boeckhout et al., 1986: 100). The methods discussed here, their basic aim and the scope of their use are summarised in table 3.4 below.

Table 3.3: overview of evaluation methods, their aim and scope

Evaluation method	Characteristics
Cost-allocation procedures	Aim: analysis of the allocation of costs of a project over individual stages of that project Scope: both private and public domain. Instrument for financial planning
Life-cycle costing	Aim: analyse the societal costs of a product during its total life span Scope: both private and public domain. Instrument for the analysis of public and private costs of a product.
Incremental cost analysis	Aim: analysis of the progression of total costs over the life span of a project or programme. Scope: instrument for financial planning. Both private and public domain.
Market analysis	Aim: analysis of a specific market as input for private economic actors to making strategic decisions Scope: business-economics, private domain
Competition analysis	Aim: analysis of the effects of initiatives/projects on the competitive position of a company or economic sector Scope: both private and public domain. Input for more comprehensive evaluations.
Economic impact analysis	Aim: analysis of the economic effects of a project or initiative. Scope: both private and public domain. Quantitative analysis in monetary units. Both direct and indirect economic effects, but no effort to include imponderabilia.
Social impact assessment	Aim: analysis of the social effects of a project or initiative. Scope: mainly public domain. Qualitative and/or quantitative analysis in non-economic units.
Socio-economic effect matrix	Aim: qualitative assessment of the socio-economic effects of public policy programmes and projects Scope: public domain. Qualitative analysis.
Environmental impact analysis	Aim: qualitative and if possible quantitative analysis of the impact of projects or programmes on the environment. Scope: mainly public domain. Input for comprehensive decision-making.
Cost-effectiveness analysis	Aim: analyse which alternative leads to the achievement of a predefined goal against the least costs. Scope: both private and public domain. Often applied to economic evaluation of public policy.
Cost-benefit analysis	Aim: analyse the costs and benefits of programmes or projects in monetary unit. Scope: public or private. In case of private use, often restricted to analysis of direct economic effects (business-economics). In case of public use, often aimed at analysing all effects that can be expressed in monetary units (societal or socio-economic cost-benefit analysis). Scope depends on the number and types of effects included in the analysis.
Scenario-analysis	Aim: predict the effects of various alternatives on the basis of models with various starting points and assumptions. Also meant for sensitivity analysis of various model variables. Scope: both private and public domain, but most often used in public domain. Comprehensive, if possible quantitative analysis of effects over considerable time period, based on assumptions.
Multi-criteria analysis	Aim: comprehensive analysis of the effects of projects or programmes (and their alternatives). Scope: usually public domain. Analysis of all effects. Qualitative, quantitative and monetary analysis. Comparison of effects expressed in different units on the basis of weighing factor based on expert judgement and political priority setting.

THE CHOICE OF AN EVALUATION METHOD

From the description of evaluation methods above, a number of criteria and characteristics can be distilled that (may) play a role in the choice of an evaluation method:

- Is the project or programme to be evaluated *private or public* in nature?;
- Which *types of effects* are to be evaluated? These types of effects can be costs and or benefits, direct or indirect effects, economic or non-economic effects, effects priced in an existing market or externalities, etcetera;
- Are the effects to be evaluated in a qualitative, quantitative or monetary *unit*?;
- To what extent *can* the effects be evaluated in qualitative, quantitative or monetary units (what is the *quality of the available data* for valuation?)?
- If effects are expressed in different units, how will these effects be *compared*?;
- At what *level* are the effects to be evaluated (at the level of the project, at the level of society or even at an international level)?
- Will the effects be evaluated as *net aggregate effects* on society, or will *distributional effects* also be included in analysis?;
- Over which *time span* will the effects be evaluated?;
- How will effects that occur in different parts of the time scale be *weighed* relative to each other?

As a guiding rule, it can be stated that evaluations of projects or programmes according to the principles of integrated water management should include all of the effects of such initiatives, at all levels of scale, and over a long period of time, or at least contribute to such a comprehensive evaluation of the effects. These requirements place high demands on the evaluation methods to be used. In the empirical part of this thesis, it will be analysed to what extent the criteria discussed above play a role in the discourse about the application of economic evaluation methods for public projects in Dutch water management.

As was discussed before, some evaluation methods are more suitable for comprehensive (or 'integrated') analysis than others. Van Mierlo et al. (1997) state that the cost-benefit analysis, cost-effectiveness analysis and multi-criteria analysis are the most commonly used 'integrated evaluation methods'. According to these authors, the key criterion for the choice of an integrated evaluation method is the availability and quality of the required data. In case all effects of a project can be expressed in monetary terms, a societal cost-benefit analysis (SCBA) can be performed. In case the benefits of a project cannot or need not be expressed in monetary terms, one can revert to cost-effectiveness analysis. In this situation, the benefits of the alternatives studied are presumed to be identical and the analysis aims to assess which alternative entails the lowest costs. However, assuming that the benefits of all alternatives are identical may in some cases be a very crude assumption, which may violate the 'integrativeness' of the method. In such situations, the focus may be too much on specific functions or goals of the initiative being evaluated, therewith neglecting possible side effects.

In case it is only possible to measure the different types of effects of a project in different units (f.e. monetary, physical and qualitative), costs and benefits cannot be expressed in one common denominator. In that case, in terms of quantitative analysis, ambitions have to be taken one further step back and a multi-criteria analysis can be performed. According to Van Mierlo et al., a mature (integrated, societal) cost-benefit analysis is clearly the most ambitious method. However, as was argued earlier this chapter, expressing all effects in monetary terms is often a formidable if not impossible task, especially in case of large and complex projects. Therefore, it should be noted that cost-benefit analysis is the *potentially* most comprehensive method for the evaluation of *economic effects*. In case the evaluation

aims to assess all effects of project alternatives, either a multi-criteria analysis should be used, or the societal cost-benefit analysis should be supplemented with methods aiming at the evaluation of non-economic types of effects. For a more extensive discussion of the steps in (integrated) economic evaluation and the demands placed on required data in each of these steps, I refer to Grigg (1996) and Schuijt (2001a).

COST-BENEFIT ANALYSIS

The method most frequently used for an evaluation of economic effects of infra-structural projects is cost-benefit analysis (CBA). As was argued earlier, this method is the potentially most comprehensive economic evaluation method. Therefore, some aspects of the economic theory behind this method will be discussed in a little detail here. Cost-benefit analysis involves the identification, quantification and weighing of costs and benefits associated with a certain action to determine the economic effects of this action (Wills, 1997). According to this method, for a project to be accepted on the ground of cost-benefit analysis requires the present value of benefits to exceed the present value of costs, independent of who reaps the benefits and who must bear the costs. This indicates that cost-benefit analysis as such is not concerned with distributional effects or intertemporal (and intergenerational) equity.

Efficiency

As was discussed earlier this chapter, the fundamental theorem of welfare economics states that in perfect competition, the market mechanism provides for an efficient allocation of resources (Nas, 1996). Efficiency in economics is defined as allocative efficiency. If this situation is achieved economists speak of a Pareto optimum situation. The Pareto criterion is only concerned with efficient allocation, regardless of the distribution of resources among various groups of actors. Therefore, the term '*potential* Pareto efficiency' is often used, indicating that allocative efficiency could occur and that those benefiting from the (re-) allocation of resources in this efficient situation could in principle compensate those losing. A social condition is Pareto-optimal or Pareto-efficient when it is not possible to shift to another condition judged better by at least one person and worse by none (Sen, 1970).

A widely discussed alternative to the Pareto principle is the Kaldor-Hicks welfare criterion. This criterion stipulates that a rise in social welfare is always present when the benefits accruing to society through the (re-) distribution of value in a society exceed the corresponding costs. A change thus becomes desirable when the winners in such a change could compensate the losers for their losses and still retain a substantial profit. In contrast to the Pareto-criterion, the Kaldor-Hicks criterion contains a general compensation rule (Kaldor, 1939). However, common critique on the Kaldor-Hicks rule is that not just the *possibility* of compensation *per se*, but rather the actual distribution of effects and related compensation is the relevant criterion in these evaluations. Besides, opponents argue, adherents of the hypothetical Pareto efficiency criterion and/or the Kaldor-Hicks rule do not take into account that setting up and implementing an arrangement for compensation is accompanied by (substantial, and maybe even prohibitive) administrative costs. According to these opponents, these administrative costs should thus be added to the cost-side of the CBA. In case the outcome of the CBA is still positive in a situation in which these costs are included in

the calculations, and compensation is actually paid, one can speak of an *actual* Pareto improvement (see Turner et al., 1994: 96).

Net present value

For cost-benefit analysis, the potential Pareto criterion of welfare economics is translated into the Net Present Value criterion. Net Present Value (NPV) is defined as the flow of net benefits (benefits minus costs) accruing to a project over a certain time period discounted into present values. The NPV-criterion states that a project should be accepted when the discounted stream of benefits is larger than the discounted stream of costs (Hanley and Spash, 1993). Furthermore, the maximum Net Present Value criterion suggests that resources should be allocated to that project maximising the Net Present Value of benefits. Although other criteria also exist (see f.e. Nas, 1996), according to Hanley and Spash only the maximum NPV criterion leads to efficiency. Because the NPV is a crucial criterion in CBA, discounting is expected to play an important role in the debate about the role of economic evaluation methods in integrated water management. This is even more the case since according to the dominant interpretation (as 'sustainable water management') integrated water management should be concerned with the distribution of effects between generations.

Types of CBA

Different types of cost-benefit analyses exist. A financial cost-benefit analysis evaluates activities (projects, policy measures) from the point of view of an individual entity, usually the entity undertaking the activity (for example a company), while the social cost-benefit analysis evaluates the effects of an activity from the point of view of society as a whole (Eijgenraam et al., 2000). If the effects of a project on the environment are incorporated in the cost-benefit analysis, a specific type of societal cost-benefit analysis is sometimes distinguished, referred to as the eco-cost-benefit analysis or ecosystem-oriented cost-benefit analysis (eco-CBA) (see f.e. Bouma and Saeijs, 2000). The purpose of the CBA for a large part determines which type is chosen. In turn, the type of method chosen for a large part determines the role of this method in policy, for example relative to other types of evaluation methods. As was argued before, in integrated water management, public projects and programmes should be evaluated with regard to their impact on society as a whole, including the environment. Therefore, in principle, a SCBA should be applied in all cases. This 'society' could even mean an international society of for example a river basin. As showed from the discussion above, key aspects in this integrated evaluation are the distribution of effects between actors (including 'the environment'), both in terms of intra- and inter-generational equity.

3.6 SELECTION OF POLICY INSTRUMENTS AND EVALUATION METHODS

3.6.1 INTRODUCTION

Earlier this chapter, I discussed the characteristics of integrated water management and (economic) theory about an economic analysis of societal and political issues. The discussion

of these two perspectives and their confrontation resulted in a description of the hypothetical applicability and role of economic policy instruments and evaluation methods in integrated water management. In chapter 2, policymaking was presented as a choice-process, in which various advantages and disadvantages of policy instruments and evaluation methods are weighed. In this section, I will discuss which aspects may play a role in the selection of policy instruments and evaluation methods. This discussion will start in subsection 3.6.2. with a discussion of a number of issues related to the choice of policy instruments. Then, in 3.6.3, the perspective will be broadened to include a number of institutional considerations (both formal and informal) regarding the choice of policy instruments. These considerations will relate to the application of economic policy approaches in (integrated) water management. Finally, in subsection 3.6.4, I will present a taxonomy of selection criteria based on theoretical insights.

3.6.2 ISSUES REGARDING THE CHOICE BETWEEN CACs AND EIs

In this subsection, a number of practical and ethical issues will be discussed related to the choice between taxes and standards and to the purpose and design of taxes. Whereas earlier this chapter, a number of theoretical advantages of EIs over CACs were discussed, this section presents a number of issues related to economic steering instruments (especially taxes) that put these advantages in perspective and that may lead various groups of actors to consider EIs as undesirable instruments.

EMISSION STANDARDS VERSUS TAXES

While pollution taxes in theory possess several attractive attributes compared to standards (see also table 3.2), there are also some major obstacles for their use. For example, setting an optimal Pigovian tax in practice is difficult, perhaps most fundamentally because of the uncertainty surrounding the actual damage costs associated with any particular pollutant. Definition of the marginal environmental cost is a vital precursor to the setting of a Pigovian tax. This however puts high demands on availability of data on and scientific and economic understanding of a range of factors (see Pearce and Turner, 1990). A complete gathering and processing of this information is complex and costly and may thus lead to disputes between interested parties and may decrease the efficiency of the EI. Besides, in order to calculate the optimal Pigovian tax, it is also necessary to know the benefit value of the good being produced, i.e. ideally we also need to know the MNPB (marginal net private benefit) line. According to Turner et al. (1004: 171), this again is likely to lead to conflict between interest groups. According to the same authors, in reality then, accurate calculation of an optimal pollution tax level is likely to be an unrealistic goal. The best that we can hope for is to determine an acceptable compromise in the face of imperfect information. This pervasive uncertainty about the damage to the environment and the total value of the good produced increases the risk of a sub optimal tax scheme and this will compromise on the efficiency of the instrument.

Equity and fairness

A very controversial question in relation to green taxes is the question who pays and who should pay. This aspect of taxes is discussed here because it is expected to be an important

argument for opponents of green taxes in water management in the debate about their implementation. Equity can be interpreted as an equal distribution of the tax burden among target groups. This involves the question whether or not specific target groups are disproportionately burdened by the tax as compared to other target groups. Fairness can be interpreted as a fair absolute burden on one target group. Most of the concern about pollution taxes has focused on their impact on consumers. After imposing a pollution tax, a firm's first reaction is likely to be to try and maintain its existing output and profits by attempting to pass on this tax to consumers in the form of higher prices. The increase in price and resulting decrease in consumption causes a welfare loss to consumers, although this loss is likely to be lower than the damage cost of pollution avoided by introducing the tax⁶⁴.

The question with regard to the impact of the tax on the utility of consumers is whether it is fair that consumers should often be forced to pay higher prices as a result of imposing a pollution tax. According to Turner et al. (1994), in principle, the answer must be 'yes'. By oversimplifying somewhat, they argue that producers only produce those goods that are demanded by consumers. Therefore, the environmental costs caused by production and consumption of these goods should also be borne by these consumers. Critics of pollution taxes have argued that the effect of higher consumer prices will be to punish the poor proportionately more than the rich, as the rich will be able to pay for the price rises they induce with relative ease compared to the poor. Such taxes are called distributionally regressive. This problem can however be overcome by returning revenue to those proportionally worst affected. Through redistribution of tax funds, a pollution tax can therefore be made fiscally neutral (no net impact upon tax revenues), while still encouraging consumers and producers to move towards low pollution profile goods. A pollution tax has the added bonus that, whereas most taxes (e.g. income taxes, investment taxes, etc.) distort the economy by discouraging activities which are essentially 'good' (i.e. earning, investing, etcetera), a pollution tax attempts to correct a market failure by stopping something which is regarded as essentially 'bad', namely pollution. Such a shift from taxes on labour and other essentially desirable activities to taxes on environmental adverse activities is commonly referred to as 'greening of the tax system'.

With regard to the impact on firms of taxes as compared to emission standards, Turner et al. (1994: 171 a.f.) argue on the basis of experience in England that the loss of profit for a firm under socially optimal tax rates is likely to exceed that under a fixed emissions standards regime. Some commentators claim that this difference in profits has led industry to put pressure on governments to retain an emission standards regime rather than adopting a pollution tax approach (see for example Buchanan and Tullock, 1975; Theeuwes, 1991). In case of pollution taxes set at a level resulting in a socially optimal level of pollution, the firm is still being forced to pay tax for all the units produced up to this level (this was referred earlier as the dynamic incentive of taxes). The arguments used by critics of this dynamic incentive is that because the amount of pollution at this level of production can be completely assimilated by the environment, no net cost is being placed upon society. The related question then is why the firm should pay tax even on these remaining units of

⁶⁴ In fact, a net welfare gain to consumers exists from introducing the pollution tax. However, the benefits are less visible than the costs. This is a common problem of instruments for environmental policy.

pollution. Pezzey (1988) has cited this uncertainty about the justice of Pigovian taxes as one reason why policymakers have generally not implemented them.

Impact on competitiveness

One of the presumed major weaknesses of pollution taxes (and therefore one of the main arguments against them) is their effect on competitiveness. When a country imposes a pollution tax unilaterally, the argument is that this country will be put at a disadvantage compared to foreign competitors. This means that a pollution tax is likely to be introduced on a significant scale only if it is introduced by a number of countries acting together (Pearce, 1991). This joint agreement, however, is accompanied with additional problems (see Turner et al., 1994: 178). Firstly, it will always be in the interest of any one country to see all other countries, except itself, sign such an agreement. In this way, it benefits from their reductions in global emissions, without itself having to suffer increased production costs, thereby gaining a competitive advantage over all foreign countries whose firms now have to pay the pollution tax. This 'free-rider' effect is a very strong incentive against such agreements. It could therefore be argued that this type of tax should be implemented at a supra-national level, such as the EU. Chapter four will show that this is actually considered for a number of issues in water management. Since water pollution (seas and oceans left aside) is restricted to limited geographical areas, namely river basins (also called catchment areas), for the EU this problem could be circumvented by implementation at the EU-level. Secondly, to ensure fairness, the rule for each country should be different, because each country creates a different amount of damage based upon the size and technology of its economy. Third, because of that, each country would also face different pollution abatement costs, which would be rejected from the perspective of international equity. Therefore, there would be extreme difficulty in getting all countries to agree on one common level of pollution tax per unit of emissions.

Tax base, revenue raising characteristics and revenue use

Further complicating the choice among alternative policy instruments is that some will produce government revenue, while others will not. Recently, this distinction has received a great deal of attention because some environmentally oriented charges or taxes will produce large amounts of money. According to Russell (2001: 9), how to take into account the effect of these revenues on the government's general tax requirements is a complex and still somewhat cloudy question. The revenue-raising characteristic of a policy instrument not only influences the opinion of policymakers, but also that of private actors affected by the instrument. Whether or not the target groups and (possibly) other stakeholders affected by the levy will accept 'revenue-raising policy instruments' depends on a number of factors. Firstly, this is the base of the levy (the activity or phenomenon at which the levy is directed). Secondly, the purpose of the revenues raised also plays an important role. If the levy is raised to finance specific government tasks (which is referred to as an 'earmarked levy', such as a charge), it will stand a bigger chance of being accepted than if the income 'disappears' into the general budget of public authorities (in case of a non-earmarked levy, such as in case of general taxes). Although a tax or charge can be expected to have a certain purpose, this may not be perceived as such by the target group. Whether a tax or charge, intended to change behaviour, has the intended effect, also depends on the elasticity of supply and demand for 'good' or 'bad' behaviour. This characteristic is also likely to influence acceptance

of the instrument. In case the elasticity is low, the levy will have a low regulatory environmental effect and is therefore likely to be regarded by the target group as a vulgar revenue-raising instrument.

Another factor influencing acceptance of a tax or charge not mentioned by Russell, but related to the earmarking-factor, is whether or not the revenues raised by the tax will be redirected or redistributed to the economic sector that paid the tax or charge. The fact that a levy is earmarked does not necessarily mean the revenues will be used for the benefit of the target group. This redirection or redistribution of revenues to the target group can take many forms, such as financing education and training programmes, subsidising environmentally benign activities in the sector, uniform redistribution of the revenues and tax alleviation on other taxes directed at the sector (greening of the tax system within a specific sector). A greening of the tax system may result in a dilemma regarding the tax revenues. A shift in the tax-burden from, for example, labour towards environmental resources may lead to production and consumption patterns that favour a high input of human capital and a low input of environmental resources. If a 'green tax' is environmentally effective (i.e. leads to lower use of natural resources, or to less emission of pollutants), the taxable activities reduce in quantity or volume, which will reduce tax revenues. On the other hand, if green taxes prove to be environmentally effective (help reaching environmental goals), less costs will have to be made by public authorities to safeguard a certain ambient environmental quality, thus requiring less tax revenue for environmental policy. So if a shift towards green taxation is envisioned, a tax on a commodity showing highly elastic demand will not lead to the desired substitution of normal taxes by the same amount of green taxes. Whether or not the green taxes are acceptable from the point of view of raising revenues thus depends highly on the elasticity of demand and the purpose of the tax and its revenue.

Each of the issues discussed above may be an argument for actors involved in the discourse about the application of policy instruments to support or oppose to economic steering instruments. In this discourse, the same issue may be used either in favour of or against the use of these instruments, depending on the interpretation of the performance of an (envisioned) instrument with regard to this issue. Therefore, an analysis of the story lines with regard to these criteria will play an important role in explaining the choice of policy instruments as a result of the 'field of power' between actors, which is partly formed by discourse and partly by institutions and resources. In the discussion of these issues, the possible motives and arguments of a number of actors were discussed. An important category of actors in this thesis are public actors (politicians and public administrators), since they are usually the initiators of public initiatives. Therefore, this group of actors may play an important role in the choice of policy instruments and evaluation methods. However, an extensive discussion of the motives and arguments of this specific single group of actors would go beyond the purpose of this chapter. For an (very) interesting discussion of the possible motives and arguments of this category, I therefore refer to De Savornin Lohman (1994). This author discusses possible explanations for the preference of public actors for permit giving over incentive charges on emissions in Dutch environmental policy from the perspective of environmental and cost-effectiveness, administrative costs, distributional impacts and the context of policymaking ('public policy arenas').

3.6.3. INSTITUTIONAL CONSIDERATIONS REGARDING AN ECONOMIC APPROACH TO WATER MANAGEMENT

CONSIDERATIONS REGARDING INFORMAL INSTITUTIONS: PARADIGMS

Policy paradigms

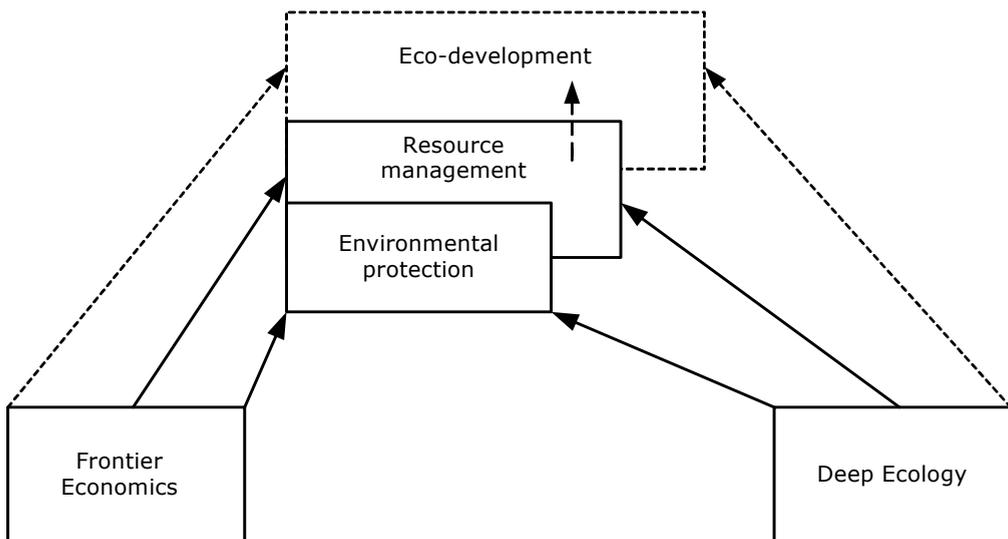
As was discussed earlier, policy paradigms are collective 'belief systems' that form the basis for judgement regarding the phenomena that constitute problems for society and regarding the way problems (or issues) should be addressed through policy. O'Sullivan (1999: 311) gives the following (working) definition of a policy paradigm: 'policy paradigms are cultural frameworks that govern the policy process. They embody linguistic, epistemic, normative, affiliative and procedural dimensions. They regulate what is to be defined as a meaningful problem, how it is to be thematised and described, what is to be considered worthy as data, who is to be recognised as a legitimate participant, and with what status, and how, the policy process is to be enacted, realised and evaluated'. From this definition, it becomes clear that policy paradigms play an important role in the selection, design and implementation of policy instruments and evaluation methods, and of other elements of policy, such as principles, concepts, goals and programmes, in any policy domain. Earlier this chapter, it was argued that an aspect of major importance with regard to the contribution of economic policy instruments and evaluation methods to integrated water management is the way the environmental 'interest' is included in policymaking. Policy paradigms regarding the man-nature relationship are therefore considered especially relevant for this thesis. These will be discussed in more detail below.

Policy paradigms regarding the man-nature relationship

In a discussion paper for the World Bank, Colby (1990) discusses developments in environmental management. According to Colby, the importance and the methodologies of environmental management, and its relationship to human development, are in a period of dramatic change. Conceptions of what is economically and technologically practical, ecologically necessary, and politically feasible are rapidly altering. Implicit in such changing strategies are varying philosophies of relationships between humans and their natural environment. In every period or era a specific paradigm or 'spirit of the times' is dominant. Colby claims that for centuries, a usually implicit debate has prevailed between what have come to be called 'economics' and 'development' on one side, and the 'preservation of nature' and 'ecology' on the other. The paradigms that represent the extreme sides of a spectrum of paradigms related to this dichotomy are referred to by Colby as 'frontier economics' and 'deep-ecology', respectively. 'Frontier economics' is the term used by Kenneth Boulding to describe the approach that prevailed in industrial countries until the late 1960s. At its most basic, it treats nature as an infinite supply of physical resources (i.e. raw materials, energy, water, soil and air) to be used for human benefit, and as an infinite sink for the by-products of the development and consumption of these benefits, in the form of various types of pollution and ecological degradation (Boulding, 1966). At the same time, a vigorous strain in the public debate has been that predominantly coming from ecologists, who see very clearly the finiteness of the world and its resources. This paradigm, which advocates going back to more simple forms of society (Small is beautiful, see Schumacher (1974)), is referred to by Colby as the 'deep ecology'-paradigm.

In the 1990s, societies have started serious discussions about 'sustainable development'. Many different ideas have emerged and are emerging, from a wide range of disciplines, about what environmental management and sustainable development entail. Colby distinguishes five broad, fundamental paradigms of environmental management in development or, in other words, of human-nature relationships. According to Colby, in the course of time paradigms will develop in which the environment and the economy/economics will be more and more integrated and will interact in an increasingly balanced way. Colby argues that from the two archetypal paradigms of 'frontier economics' and 'deep ecology', three other paradigms have developed, which all lie between these two extremes. These three other paradigms are 'environmental protection', 'resource management' and 'eco-development'. These paradigms have emerged in a progression that involves increasing integration of all three of economic, ecological and social systems into the definition of development and the organisation of human societies. Each paradigm perceives different evidence, imperatives, and problems, and each prescribes different solutions, strategies, technologies, roles for economic sectors, culture, governments, ethics, etcetera. The development of paradigms is schematically represented by figure 3.3 below⁶⁵.

Figure 3.3: Evolutionary paradigms diagram



(Source: Colby, 1990: 7)

The diagram attempts to indicate schematically the non-linearity of paradigm evolution in the following ways. The vertical scale represents the progression in time from one paradigm to the next going upward; the horizontal scale indicates the upper three paradigms' position on

⁶⁵ For an extensive discussion of each of the paradigms identified by Colby, I refer to Annex II or Colby (1990).

a spectrum between the 'diametrically opposed' frontier economics and deep ecology paradigms. The size of the boxes of the upper three paradigms signifies (roughly) the degree of inclusiveness and integration of social, ecological and economic systems in the definition of development and organisation of human societies. Non-solid lines indicate the hypothesised future.

According to Colby, people's views on their relationship with nature are one of the most important aspects of any strategy for human development, though they are very often implicit. Since this relationship is at the root of each of the seemingly distinct fields of 'environment management' on the one hand and 'economics' and 'development' on the other, its evolution is fundamental to current discussions and the future practice of 'sustainable development'. There are many ways of describing this fundamental relationship and how different social conceptions of it translate into or impact on practical management. Colby states that certain approaches, originating from specific paradigms, are probably more appropriate to certain problems or issues than others. Therefore, he states, concepts and techniques from all five paradigms will be necessary for long into the future; however, according to Colby, what is definitely changing is the dominance or relative degrees of emphasis the different approaches are given.

The discussion of policy paradigms in this subsection so far made clear that fundamental thoughts about the way to address the man-nature relationship may differ widely. On the other hand, the dividing lines between some of the paradigms presented may often prove to be unclear, especially when operationalised into practical elements of policy, such as policy principles, programmes and instruments. Different paradigms may even lead to the same practical elements of policy, either or not motivated from a different fundamental perspective. In such a situation, it would be important to analyse whether or not, and in what way, interpretations or operationalisations of these elements differ between paradigms. Individuals and groups of individuals may even vary in position with regard to the paradigms adhered to in respect of various different policy issues. Besides, it is very well thinkable that actors favour a combination of approaches advocated by different paradigms with respect to a single issue. As was mentioned earlier, due to developments in society, the clear categorisation of actors in paradigmatic schools as could be observed in the 1960s and '70s is slowly disappearing. Nowadays, environmentalists may favour certain economic approaches, while entrepreneurs may favour non-economic policy approaches (if any). This is also the result of a slow redefinition of which goods and services are important for society and of the 'value-balance' of goods and services (including those of nature) in markets. So besides the fact that policy paradigms have come to lie closer to each other, it is no longer obvious on forehand which actor adheres which paradigm. Therefore, this will have to be identified for each single policy issue studied. Moreover, the number of actors involved in the policymaking process has expanded since the 1960, complicating the categorisation of actors into policy coalitions.

The role of policy paradigms in empirical analysis

Various accounts exist of the relationship between policy paradigms and other elements of policymaking. Colby (1990) argues that two types of evolutions are entwined in the discussion about paradigms: that of the historical evolution of the concepts and tools within the particular paradigms, and that of the historical progression in the dominance of their use.

In this thesis, the evolution of individual paradigms itself will not be studied. However, the dominance of certain paradigms over others is studied to explain the choice and content of economic policy instruments and evaluation methods in Dutch water management. The paradigm adhered to by the dominant policy coalition will be reflected (embedded) in formal institutions, reinforcing and objectifying the position of economic instruments and methods.

With regard to the relevance of policy paradigms regarding the man-nature relationship for the application of economic policy instruments and evaluation methods in Dutch water management, the observations made above complicate the analysis. Whereas thirty or forty years ago, the dichotomy between 'frontier economics' and 'deep ecology' may have been observable in various policy coalitions in water management, on the basis of the developments presented above, it may be expected that the identification of these policy paradigms in present day water management is not a straightforward matter. Differences in paradigms adhered to by actors involved may be subtle and positions may vary between the issues addressed. Nevertheless, it is expected that some paradigmatic positions of actors can still be identified in empirical analysis. Besides, these paradigmatic positions are expected still to account for some part for the interests, motives and therefore for behaviour of actors involved. Therefore, these paradigms are considered as important elements of the analytical framework of this thesis.

The relationship between layers within paradigms and belief systems regarding environmental policy

Since, as was argued above, the outcomes of policymaking processes are the result of interactions between actors involved, each having his/her own belief system consisting of fundamental and more pragmatic layers of belief, choices in the policymaking process can be compared to individual choices on the basis of this person's belief system. Both contain fundamental, ideological and pragmatic elements and thus choices. Russell (2001) provides an interesting illustration of the relationship between core beliefs and near core beliefs of paradigms and belief systems for environmental policy. This discussion illustrates the relevance of various layers in paradigms and belief systems for the choice of policy instruments. Russell claims a fairly linear link exists between an actor's view on the causes of environmental degradation and the policy approach suggested by this actor. With regard to the link between core beliefs and near core beliefs that result from them, Russell states the following: 'Not surprisingly, the prescriptions for solutions to environmental problems differ across the imputed causes (explanations)⁶⁶. In terms of Wiering and Immink (2003), there is a clear causal relationship between an actor's ontological beliefs on the one hand and normative and strategic beliefs on the other. According to Russell, elements that justify each view can be found in every significant problem. The differences should therefore be seen as differences of degree, or emphasis.

According to Russell (2001), institutional analysis is characteristic of the economist's approach to environment issues. With regard to the imputed causes, the stress is on the failure of the markets we depend on to organise provision of all required goods and services (ontological discourse), on the need for collective decisions to do something about those

⁶⁶ For a detailed discussion of various imputed causes and the related prescriptions for solutions with regard to environmental issues, I refer to Russell (2001).

failures (normative discourse), and on analysis of alternative ways to 'do something' about this failure of markets (strategic discourse). Economists are likely to favour policies that provide incentives that push in the desired direction but that leave the specifics of responses to the individual actors in the economy (consumers, firms and farms). Besides, according to Russell (idem), they are more likely to think about how to live in the presence of ignorance rather than to say that knowledge must be obtained before action should be taken (Russell, 2001: 6). This statement would mean that a stereotypical economist would in general object to the 'precautionary principle', which states that if the effects of human activities that are potentially harmful to the environment are not known with a considerable degree of certainty, this activity should not be undertaken. Economists therefore basically have a risk-seeking attitude.

Although it may not always be clear under which layer a view can be shared and although the boundaries between the layers may not always be very clear, the analytical distinction between different layers of views (and thus of motives) is expected to help categorise and explain the behaviour of stakeholders in the decision-making process, for example with regard to the degree of resistance to change. A change that runs counter to an actor's fundamental belief is expected to generate more resistance from that actor than a change that runs counter to an actor's secondary aspects in the belief system only.

Scientific paradigms regarding actor behaviour

Scientific paradigms can play an important role in policymaking, since, as was argued before, science often has an important influence on the perception of phenomena by the societal and political arenas, which are considered to determine the political agenda to a large extent. Besides, they often form the basis of policy paradigms. Science is generally regarded as an important supplier of (dependable) information on which to base policy decisions. The type of information supplied by the scientific arena is therefore likely to influence the alternatives considered and the type of decision taken. Within the scientific arena, various types of paradigms can be distinguished. Since actors take a central role in policymaking, an important type of paradigm in the context of this thesis is the view within various scientific paradigms on (the analysis of) actor behaviour. Various views on actor behaviour can be found in different scientific disciplines, as well as between schools within these disciplines. These views lie at the basis of explanations for certain societal phenomena. A number of these views will be discussed here.

In political science, *Homo Politicus* is stereotypically seen as a '... human being who tries to consider what is best for society....' (Faber et al., 2002). The individual is a citizen that is concerned with public interest and the community, and its main characteristic is to strive for political justice. Of course, this is a stereotype of the *Homo Politicus*, and thus an oversimplification of the view taken in political science, since it was already mentioned that also within scientific disciplines, different views exist, represented by separate schools of thought within these disciplines. For example, the *Homo Politicus* can also be seen as a human being who tries to make a career in the public domain. From this perspective, the individual will be more concerned with private interest and personal gain, and his strategy will probably be focused on maintaining public and political support. In sociology, *Homo Sociologicus* is (again, stereotypically) an individual actor that is connected to other actors in a variety of ways and that is embedded in societal (and social) structures – the actor is a

social one (Swedberg, 1987). Man is not viewed only as rational, but as showing a variety of behaviour. This divergence from rationality as point of departure, which is central in classical and neo-classical economics (see below), is abandoned by later schools of economic thought, such as new institutional economics and behavioural economics, which include concepts such as bounded rationality and altruism in their analysis. As such, these schools of economics can be said to show closer resemblance to sociological viewpoints than do classical and neo-classical economics.

In neo-classical economics, the individual is a *Homo Oeconomicus*, an 'autonomous rational consumer who allocates his/her income at the margin among an array of consumer goods' (Gowdy and Mayumi, 2000). Economists attempt to explain and discover patterns of behaviour as to why people make certain choices in situations of scarcity. In these choices, the motivation of *homo oeconomicus* is self-interest – choice is a problem of optimisation, known as utility or welfare maximisation. Although rationality is a common denominator in all (neo-) classical analysis, different approaches towards rationality do exist. For example, the principle of *bounded rationality* is sometimes used. According to this principle, humans have a limited intellectual capacity to formulate and solve complex problems. This limited capacity is often insufficient for making rational decisions when facing such problems, which thus results in sub optimal decisions being taken. The fundament of this principle is *satisficing*, where humans pursue acceptable levels of welfare, profit or other indicators. This principle opposes to the classical assumption of welfare or utility maximisation on the basis of rational decisions (Van den Bergh, 2000).

From the discussion above, it shows that different scientific disciplines and schools within disciplines focus on different aspects of, and thus generate different types of information about, actor behaviour. Different actors involved in policymaking are likely to be interested in different aspects of society, policymaking and its consequences. Therefore, they may have an interest in involving the scientific discipline that generates information about the aspect they are interested in and that best supports their interests in policymaking. The dominant policy paradigm in the political arena will largely determine which scientific disciplines (and thus paradigm(s)) will feed the policymaking process with information. As such, these disciplines are likely to confirm the dominant policy paradigm. On the other hand, off course, opponents of the dominant policy paradigm are likely to look for scientific information (either or not from different disciplines) that can take away arguments used by actors in the dominant policy arrangement. As such, the selective use of scientific information may be an important resource in influencing the discourse about a policy domain or issue.

CONSIDERATIONS REGARDING FORMAL INSTITUTIONAL DEMANDS FOR ECONOMIC APPROACH TO WATER MANAGEMENT

Institutions related to economic policy approaches in water management

Economic policy instruments are interpreted as policy instruments that intervene in markets. In order to analyse the role of economic policy instruments in water management, it is therefore important to understand which institutions constitute the market, especially that for water and goods and services related to water systems and aquatic ecosystems. In a general sense, market institutions provide the rules for interactions between suppliers and

buyers. A central function of institutions is the reduction of uncertainty. In the jargon of the economist, institutions define and limit the set of choices of individuals. Institutional constraints include both what individuals are prohibited from doing and, sometimes, under what conditions some individuals are permitted to undertake certain activities. The formal written rules and informal codes of conduct are sometimes violated and punishment is enacted. Therefore, an essential part of the functioning of institutions is the costliness of ascertaining violations and the severity of punishment (North, 1990: 4). Institutions regarding methods for economic evaluation of policy regulate the content, scope and role of these methods. Since in the empirical part of this thesis, only one example will be discussed of the application of a method for economic evaluation of water policy, these institutions will not be discussed here from a general perspective. Instead, they will be addressed when analysing that specific example in chapter 5. Below, the focus will be on market institutions, which are relevant for the application of economic steering instruments. As will show from this discussions, various types of institutions exist to regulate interactions between economic agents (actors).

Types of formal constraints

According to North (idem), the difference between informal and formal constraints is one of degree. The move from unwritten traditions and customs to written laws has been unidirectional as we have moved from less to more complex societies and is clearly related to the increasing specialisation and division of labour associated with more complex societies. Generally speaking, formal rules can complement and increase the effectiveness of informal constraints. They may lower information, monitoring, and enforcement costs. Formal rules addressing the market include political (and judicial) rules, economic rules, and contracts. The hierarchy of such rules, from constitutions, to statute and common laws, to specific bylaws, and finally to individual contracts defines constraints, from general rules to particular specifications. Typically, constitutions are designed to be more costly to alter than statute laws, just as a statute law is more costly to alter than individual contracts. Political rules broadly define the hierarchical structure of the polity, its basic decision structure, and the explicit characteristics of agenda control. Economic rules define property rights, the bundle of rights over the use and the income to be derived from property and the ability to alienate an asset or a resource. Contracts contain the provisions specific to a particular agreement in exchange.

According to North, given the initial bargaining strength of the decision-making parties, the function of rules is to facilitate exchange, political or economic. Besides, it can be stated that rules define the range of possible actions of actors and their options to alter this range of actions. The combination of these views is in line with the interpretation of institutions as elements of policy arrangements by Van Tatenhove et al. (2000). The existing structure of rights (and the character of their enforcement) defines the existing wealth-maximising opportunities of the players, which can be realised by forming either economic or political exchanges. Exchange involves bargains made within the existing set of institutions, but equally the players at times find it worthwhile to devote resources to altering the more basic structure of the policy to reassign rights (North, 1990: 47). Actors can thus devote resources to obtaining rights to perform certain activities at different institutional levels (the political, the economic and the contract level). The 'higher' the level at which actors try to change the

distribution of rights, the more structural the redistribution will be, but the more costly those efforts are. The three categories of institutions will be discussed in more detail below.

Political and economic rules

Since, according to North (1990), political rules are considered to be higher in hierarchy than economic rules, broadly speaking political rules lead to economic rules, though the causality may run both ways. That is, property rights and contracts themselves or rules for their definition or transfer are often specified and enforced by political decisions, but actors representing economic interests will also (try to) influence the political structure, which may lead to an adaptation of political rules addressing the economy. In equilibrium, a given structure of property rights (and their enforcement) will be consistent with a particular set of political rules (and their enforcement). Changes in one are likely to induce changes in the other.

Property rights play an important role in deciding whether or not water management can be executed by introducing markets and economic steering instruments to regulate (those) markets. Three types of property rights are distinguished in this thesis: ownership, disposition and use rights. Since there is no single type of property rights, and various combinations of these property rights may exist for various commodities, it is better to speak of 'bundles of property rights'. As a first approximation (from the point of view of transaction cost economics), we can say that property rights will be developed over resources and assets as a simple cost-benefit calculus of the costs of devising and enforcing such rights, as compared to the alternatives under the status quo. However, as will show from the passage below, this cost-benefit calculus is not as easy as is suggested above.

The evolution of polities from single absolute rulers to democratic governments is typically perceived as a move toward greater political efficiency. But according to Wilson (1989), this efficiency is a different type of efficiency than that of economic markets. The point is that formal political rules, like formal economic rules, are designed to facilitate exchange, but democracy in the polity is not to be equated with competitive markets in the economy. The awareness of this distinction is important with respect to judging the efficiency of property rights (North, 1990: 48 and further) and (economic) policy instruments regulating or affecting such rights. In the 1980s, North revised his own argument dating from 1973 to account for the obvious persistence of inefficient property rights. He argues that these inefficiencies exist because rulers will not antagonise powerful constituents by enacting efficient rules that are opposed to their interests or because the costs of monitoring, metering, and collecting taxes may very well lead to a situation in which less efficient property rights yield more tax revenue than efficient property rights (North, 1981). North argues that the efficiency of the political market is the key to this issue. If political transaction costs are low and the political actors have accurate models to guide them, then efficient property rights will result. But the high transaction costs of political markets and subjective perceptions of the actors more often have resulted in property rights that do not induce economic growth, and the consequent organisations may have no incentive to create more productive economic rules.

The passage above showed, by introducing the distinction between economic and political efficiency, that the cost-benefit calculus of whether or not to introduce property rights is not

a straightforward calculation. Other arguments can be used to prove this point. However, discussing these arguments would go beyond the purpose of this thesis. In the discussion of criteria for the selection of policy instruments, a distinction will be made between technical and political criteria. Clear parallels exist between the distinction between these two categories of criteria and the distinction between economic versus political efficiency.

Contracts

As was discussed above, rules descend from polities, via property rights to individual contracts. As a basic rule, contracts will reflect the incentive-disincentive structure embedded in the property rights structure (and the enforcement characteristics); thus the opportunity set of the players and the forms of organisation they devise in specific contracts will be derived from the property rights structure. The various types of contracts and the situations they apply to in (Dutch) water management were already addressed in discussing the range of economic policy instruments available for addressing issues in water management.

Systems of property rights and institutions for regulating natural resource use

As was discussed earlier, a number of pre-conditions has to be fulfilled in order to be able to allocate goods and resources (including natural resources) via the market mechanism. One such requirement is that the property rights of the commodity are defined clearly and properly, so that those actors who do not possess property rights over the good can be excluded from its use. This, of course, also counts for water and water related goods and services (such as products and services provided by aquatic ecosystems). Most economists regard the lack of well-defined property rights as the very cause of overuse of natural resources, including water. It is therefore widely argued that the environment would be better protected if allocation of natural resources and buffer capacity would be based on more strictly defined (private) property rights. Advocates of this view argue that *common property*, just as open access resources, involves the risk of overuse or environmental degradation. According to Turner et al. (1994: 307), evidence does not support this blanket view: some common property regimes 'fail', many succeed, just as some private property regimes fail, while others succeed. Since it is not possible to make general statements about the superiority of one system of property rights over another, reasons for success or failure of property rights arrangements for the protection of natural resources would have to be studied in detail for single cases. This was done by Varone et al. (2002) with regard to water resources in Switzerland, by using the concept of 'natural resource regimes'. According to this concept, institutions to regulate the use of natural resources typically consist of a combination of (private) property rights and public rules. This study will be addressed further below. First, I will address causes for the failure of systems with regard to the allocation of natural resources in a more general sense.

Turner et al. (1994:308) argue that the cause of failure is often some external event that causes the internal rules and regulations about the use of resources to break down. In this thesis, these external events are referred to as exogenous factors (see chapter 2). However, it is also imaginable that failure to protect a resource properly occurs because the internal rules and regulations (i.e. those introduced by the actors involved in (regulating) the use of the resource) are insufficient or even non-existent. Reasons for this may both be external (as argued by Turner et al.) or internal, for example because the actors using a resource are

not aware that they are depleting or polluting the resource, or because, even though they are aware, they prefer short term individual gain over long-term sustainable use of the resource. Turner et al. argue that if internal rules and regulations for the use of common pool or open access resources fail, this tends to leave private property, with rights vested in single economic entities, and state property as the final options as systems for resource allocation. While there is no imperative link, state property is usually associated with public regulation of the marketplace. Private property systems tend to veer more towards the 'free market' with less government intervention. It is important to understand that neither private property nor state property guarantees environmental conservation either. Some of the worst environmental degradation occurs in countries where the state has traditionally owned and controlled the environment. Unrestrained market systems also tend to degrade the environment because of 'market failure'.

Environmental (i.e. neo-classical) economists tend to support the idea that market systems backed by interventions which themselves are based on market incentives are likely to be the best way forward (Turner et al., 1994: 308). A pre-requisite for this system would be that the institutional arrangements on which these interventions (either or not based on market incentives) are based, be well defined, clear and flexible⁶⁷. However, an interesting paradox and awkward dilemma exists with regard to this combination of market systems and market-based public incentives. Government interventions are usually directed at providing goods and services not automatically provided by a free market, or at regulating (eliminating or mitigating) the undesired side effects of a free market⁶⁸. Government interventions try to correct free markets for these two aspects. However, the more government authorities intervene in the market to correct it for these aspects, the less 'free' a market is. And the less free a market is, the less efficiently allocation of scarce resources through this mechanism takes place⁶⁹. Besides, in order to meet the requirements of fairness and equity, government interventions have to be specific, discriminative and sophisticated. However, the more specific government interventions are, the more situations will remain unaddressed by that intervention. Attempting to make specific institutions for as many situations as possible makes this system increasingly bureaucratic, and thus less efficient in terms of government expenses⁷⁰. It is the very argument of efficiency that is widely suggested as giving market

⁶⁷ Flexibility here refers to the ability to adapt to numerous special situations and the ability to cover a wide range of activities.

⁶⁸ Together referred to as externalities, which can be interpreted as those aspects not included in the institutions of the market mechanism.

⁶⁹ As was discussed before, a 'free market' refers to a market with as little market distortions as possible, being a prerequisite for perfect competition.

⁷⁰ The paradoxical mechanism of regulating a market in ever more detail and thus excluding other situations from regulation is referred to by Callon (1998) as the vicious cycle of 'framing' and 'overflowing'. Framing means the incorporation of effects that previously were not included in the calculation of effects of the activities at hand ('internalising externalities'). Overflowing is the situation in which for whatever reason, certain effects of activities are not included in the calculative framework. The logic of this theorem lies in the fact that framing leads to diversification and specialisation. A refinement of rules makes these rules apply to ever more specific situations, the result of which is that other situations fall outside the scope of those rules, and are therefore (regarded as) overflows. Besides, the political or societal weight given to (i.e. the valuation of) specific effects of interactions between societal actors can change over time,

approaches the advantage over command and control policy instruments. The lesson to be learned from the discussion of basic approaches and the related necessary institutional frameworks is similar to that of discussing policy paradigms: differences between the options open to policymakers are likely to be subtle and policy issues cannot be addressed by blue prints. Therefore, institutional frameworks for water management will also have to be tailor-made. An analytical tool that may enable the analysis of such tailor made institutional arrangements will be discussed directly below.

As was mentioned earlier, a systematic analysis of property rights regimes for natural resources was performed by Varone et al. for water resources in Switzerland (Varone et al., 2002). According to Varone et al., the use of threatened resources (including water) can be institutionally influenced and managed by means of Institutional Resource Regimes (IRs). Varone et al. (2002) define an Institutional Resource Regime as 'a combination of formal property rights (ownership, disposition and use rights) and the prominent elements of resource specific protection and exploitation policies, the design of which comprises specific aims with respect to preservation and use of natural resources, the intervention instruments, institutional actor arrangements, et cetera' (Varone et al., 2002:78). The emphasis by Varone et al. thus lies with the organisation of policy, and especially with the formal institutional part of the 'rules of the game'-dimension of policy arrangements. The central postulate of the theoretical approach of Varone et al. is that the two steering dimensions ('property rights system' and 'policy design') are complementary and must both be taken into consideration in order to achieve sustainable resource management⁷¹. This thesis also addresses both property rights regimes and specific policies in its analysis of the institutions for Dutch water management. Therefore, the analytical concept of Institutional Resource Regimes is regarded as a useful concept to analyse and explain the effect of existing institutions and the resulting use of water as a resource on choices regarding policy instruments and evaluation methods in water management. The concept shows a clear link with the concept of 'governance arrangements' in that governance arrangements can be regarded as the concrete result of 'resource specific protection and exploitation policies' supplementing the (inadequate) existing property rights regime.

3.6.4 SELECTION CRITERIA FOR THE CHOICE OF POLICY INSTRUMENTS

Based on the discussion of policy instruments and evaluation methods earlier this chapter and the considerations discussed above, it is possible to formulate a taxonomy of selection criteria individual actors in the policymaking process may use for the choice of policy instruments. As was illustrated in the previous subsections, besides on technical, economic

making rules that framed certain effects in the past obsolete and creating a demand for new framing of other effects.

⁷¹ It should be noted here that policy regarding the protection and exploitation of natural resources in this thesis is also shared under the dimension of institutions. Policy can even (explicitly or implicitly) define property rights. Therefore, the complementary elements of the institutional resource regimes as introduced by Varone et al. (2002) show close resemblance to the complementary elements of inter-individual governance structures and collective governance as discussed in the context of arrangements involving incomplete contracts.

considerations, which were discussed earlier this chapter, the choice between policy instruments (or packages of instruments) depends upon many pragmatic, strategic and fundamental considerations (which were discussed in this section). According to Turner et al. (1994: 159), many policy analysts often overlook these latter considerations. Turner et al. state that it is important that the instrument-package, besides being (economically) efficient and effective, is equitable⁷², administratively feasible, dependable, adaptable, provides dynamic and continuing incentives for improvement and is politically acceptable (i.e. politically efficient)⁷³ (see also Young, 1992).

According to Turner et al. (1994), meeting the complete list of criteria mentioned above represents the ideal situation. The challenge is to design policy programmes that can meet as many of these criteria as possible. However, some degree of trade-off is inevitable, since some of the criteria conflict with each other. All criteria but the last can be called 'technical requirements'. The extent, to which these criteria are fulfilled, largely depends on the 'technical' design of the (mix of) instrument(s). These technical characteristics of the instruments under consideration are in principle negotiable between the actors that play a role in the decision-making process. The last criterion is different in nature. This criterion can, so to say, act as a veto over all the other (technical) criteria: no matter how well technically designed (and therefore: no matter how well meeting the technical criteria), if influential actors in the decision-making process have objections on principle to the type of instrument discussed, this may after all (or on forehand) lead to rejection of this policy instrument. The political acceptability of a policy instrument may hinge upon the technical design of the instrument (f.e. leading to distributional effects influential groups of actors may not agree with), or may be based upon more fundamental objections to the (type of) instrument based on the worldview of actors involved. The fact that this criterion can act as a veto emphasises its importance. This is a major reason for expanding the scope of analysis of policymaking. The political criteria have all to do with the include actors involved, their motives and positions, the resources they have to influence the debate about the application of policy instruments in water management and existing institutions. Selection criteria can be regarded as arguments used by actors in the strategic discourse. These actors may try to focus the strategic discourse on specific criteria, on specific interpretations of these criteria and on the 'score' of a policy instrument with regard to this interpretation. They are represented by element (d) in figure 2.6.

When comparing the list of characteristics as presented further above with the list of characteristics of economic steering instruments presented earlier this chapter (table 3.2), some observations can be made. Firstly, the criteria 'economic efficiency', 'low information requirements', '(low) administrative costs' and 'dynamic incentive' were already mentioned in table 3.2 as characteristic criteria of economic instruments. These can all be regarded as technical criteria (either or not with political implications). Criteria not mentioned in table 3.2

⁷² This, amongst others, means that heavily regressive schemes (schemes that cause a major reallocation of costs and benefits among different groups in society) are to be avoided, especially if they hit the poorest worst).

⁷³ This means that the scheme does not represent a too radical departure from prevailing and likely future practices and underlying philosophies.

are 'equity', 'dependability', 'adaptability' and 'political acceptability'⁷⁴. Of these criteria, especially equity and political acceptability are criteria that are political in nature, and that can thus act as a veto criterion. These criteria are an important addition to the list of criteria and characteristics as presented in table 3.2 since they stress the relevance of political as opposed to technical criteria for (and thus aspects of) choosing policy instruments.

Opschoor and Turner (1994) present a taxonomy of selection criteria for policy instruments comparable to the one above. However, they provide a specific reasoning for their choice and categorisation of selection criteria. According to these authors, in the past, all countries' environmental policies (including strongly market oriented ones such as those in the USA) entailed the use of regulatory instruments (RIs) in a 'command and control'-strategy (Opschoor en Vos, 1989). Several developments since the late '60s and early '70s related to the dominance of these RIs may explain why the subject of instrument choice has gained increasing prominence on the public agenda. These developments can be shared in two main categories:

- increasing and (according to Opschoor & Turner, 1994) empirically based doubts as to the general *optimality* of traditional instruments, especially RIs, and;
- changes in policy contexts leading to a search for instruments more in *accord* with the new situation.

These two developments were major arguments for considering other types of (mixes of) policy instruments than RIs. Therefore, these categories can be expected to be the subject of discourse about policy instruments. Opschoor and Turner argue that the notions of 'optimality' and 'concordance' can be used to categorise two sets of criteria (to be) used in instrument choices. *Optimality* criteria are concerned with whether instruments will do the desired job and at an acceptable performance level. They deal with the effectiveness⁷⁵ and efficiency of instruments. These criteria can be equated with the technical criteria as discussed before. *Concordance* criteria have to do with the acceptability of instruments:

- consistency with policy developments such as deregulation, policy integration, internal harmonisation;
- implications for other policy objectives, e.g. in fields such as public finance and the distribution of net income;
- the acceptability of instruments (and their impacts) to vested economic and political interests⁷⁶.

An important remark to be made here is that the technical characteristics of policy instruments can have a substantial impact on the acceptability of the instrument by the stakeholders of an issue. Technical and political criteria may thus be closely connected.

Whereas economics (and other scientific disciplines) may contribute to the decision-making process regarding the choice of policy instruments by providing decision makers with information about the optimality of an instrument, this role is less obvious with regard to the concordance criteria, which involve less 'objective' information. Both the optimality criteria

⁷⁴ See for example Young (1992) for a detailed explanation of these criteria.

⁷⁵ Note that impacts other than environmental ones (which determine the effectiveness of the instrument) have been incorporated as concordance criteria.

⁷⁶ Note that this concordance criterion should not play a role in 'objective' policymaking.

and concordance criteria can be related to the trends in society and governance as discussed earlier this chapter. For example, both optimality and concordance are related to the trend of making public governance operate more efficiently. The focus with regard to technical criteria depends on the aspects of policymaking considered most important in the dominant discourse (for example effectiveness, efficiency, equity or revenue raising). Concordance criteria can in principle relate to any trend in society or governance.

Russell (2001) provides a third taxonomy of criteria for the selection of policy instruments (see table 3.4 below). In this table, he categorises the criteria according to the type of concerns related to the choice of instruments, namely static concerns, dynamic concerns, general institutional demands, political dimensions and perceived a priori risks. A number of such concerns was already discussed in the previous section. The main difference with the taxonomies as presented above is that Russell explicitly addresses institutional demands and perceived a priori risks as categories or selection criteria. This taxonomy can therefore be more easily related to the analytical framework of this thesis. The categories mentioned by Russell relate to both 'optimality criteria' (such as static and dynamic concerns) and to the context in which the decision has to be taken or in which the instruments will have to be applied (such as general institutional demands, political dimensions and perceived a priori risks). Of these concerns, 'political dimensions' and 'perceived a priori risks' can be shared in the category of 'concordance criteria' as identified by Opschoor and Turner. The concerns related to 'general institutional demands' fall somewhat in between these two categories. Russell presents these concerns as independently 'objectifiable' variables. However, this category of concerns is probably more dependent on attitude and preferences of personal actors involved than are the categories of static and dynamic concerns. As such, the former category is closer to the category of 'political acceptability' or 'concordance' than the latter.

Table 3.4: taxonomy of criteria for policy instruments as presented by Russell (2001)

<p>Static concerns</p> <ul style="list-style-type: none"> • Efficiency; • Information/computation demands; • Relative ease of monitoring and enforcement; <p>Dynamic concerns</p> <ul style="list-style-type: none"> • Flexibility in the face of exogenous changes (adaptability); • Incentive for environment-saving technical change (dynamic incentive); <p>General Institutional demands</p> <ul style="list-style-type: none"> • Agency: honesty, technical capabilities (including data gathering, model building and solving, monitoring and enforcement, and revenue handling); • Regulated parties: experience in markets, reliance on government regulations to protect markets, technical skills (including controlling discharges via production and treatment processes and making decisions about processes, products and inputs); <p>Political dimensions</p> <ul style="list-style-type: none"> • Distributional implications; • Perceived ethical message; • Perceived fairness; <p>Perceived a priori risks</p> <ul style="list-style-type: none"> • To agency: failure to achieve goals, freezing current technology for too long, possible perverse responses; • To regulated parties: false convictions, 'ratchetting down'^a of requirements.
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^a By ratchetting down is meant the adjustment of policy goals as a consequence of technological developments

(Source: Russell, 2001: 193)

The most important observation to be made with regard to the selection criteria as discussed in this subsection is that any criterion, even technical criteria, can be made the subject of debate and can therefore become elements of strategic discourse. Various actors can have different perceptions of the meaning of a criterion, the degree to which various types of instruments meet this criterion and the importance of the criterion for the choice of policy instruments and evaluation methods. Specific perceptions regarding these criteria can therefore be used for building story lines about the instrument(s) or evaluation method(s) considered. The perceptions articulated by actors in discourse may be based on fundamental views or on pragmatic motives. They are likely to reflect the interests actors have in the choice and implementation of policy instruments and evaluation methods.

SCOPE AND APPLICABILITY OF THE CRITERIA

With regard to the scope and applicability of the criteria presented above, a number of remarks should be made. Firstly, the criteria presented in this subsection related to (neo-classical) steering instruments. However, this thesis also addresses arrangements involving new institutional economic approaches and the selection and content of economic methods for policy evaluation. As was argued earlier, the (economic) evaluation of policy may play a role in every step in the policymaking process. So far, the question whether or not the considerations (i.e. criteria) as presented in this subsection also play a role in the process of choosing tools for policy evaluation remained unaddressed. Some considerations that play an important role in (economic) policy evaluation were already addressed in discussing various methods for economic policy evaluation. Besides these considerations, it can be expected that a number of more general criteria as presented in this subsection also apply to evaluation methods. The same can be argued for arrangements involving new institutional approaches. Examples of such generally valid criteria are information requirements, flexibility

in the face of exogenous changes, honesty and technical capabilities of the agency, distributional implications, ethical aspects and fairness. Secondly, the lists presented in this section aim to be conclusive lists of criteria for the choice of policy and policy instruments. However, they were mainly constructed from a rational, normative perspective, stating which criteria should be considered in this choice process. Whether these criteria are actually the criteria taken into account by actors involved in policymaking is not certain. For now, they act as a framework of reference for empirical analysis.

3.6.5 IDEAL-TYPE ARRANGEMENTS FOR THE TYPES OF INSTRUMENTS AND METHODS DISCUSSED

Based on the discussion of economic policy instruments and evaluation methods, combined with theory about policymaking processes, it is possible to construct stereotypical schemes of policymaking processes for each category of policy instrument and evaluation method discussed in this chapter. These stereotypical schemes act as hypotheses that will be tested through empirical research. Therefore, they are guiding for the operationalisation of the analytical framework of this thesis, which is done in the next section. Logically, the elements of these schemes will be presented (named) as elements of the analytical framework. In the empirical part of this thesis, three categories of instruments and methods for Dutch water policy will be analysed: neo-classical instruments for environmental policy, governance arrangements involving new institutional economic approaches and a comprehensive CBA, representing the category of economic evaluation methods. In chapter 7, these three types of arrangements will be compared with regard to the typical factors influencing the application and role of economic policy instruments and evaluation methods in Dutch water management. The elements of the ideal-type arrangements as presented here include most elements of figure 2.6 to varying degree, depending on the type of arrangement. Not explicitly included are elements (a) impulses for change, (c) paradigms and (d) selection criteria.

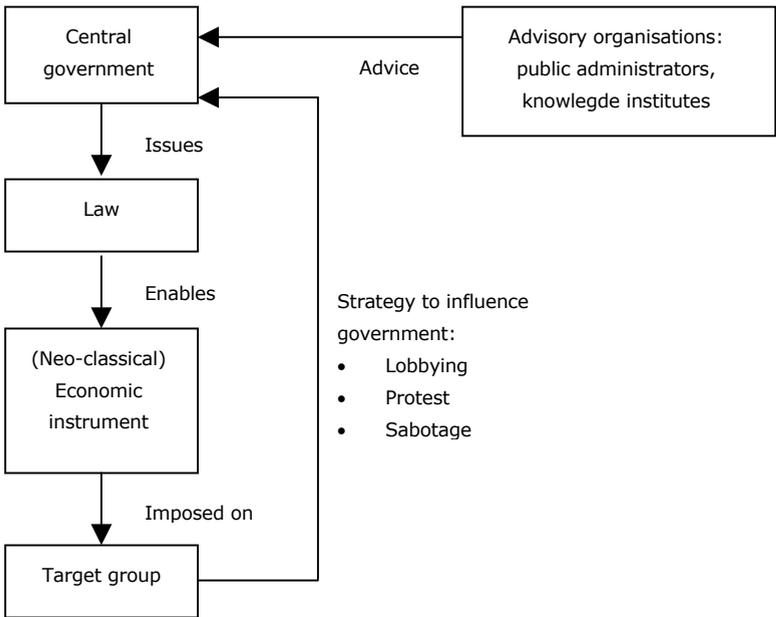
IDEAL-TYPE ARRANGEMENT FOR NEO-CLASSICAL STEERING INSTRUMENTS

As was discussed by De Savornin Lohman (1994), neo-classical policy instruments for environmental policy are based on specific laws enabling these instruments. The initiatives for these laws come from the political arena, and decision-making about the acceptance or rejection of the law also takes place in this arena. The design of the law and the instrument based on it is likely to have involved the administrative arena at the national (or international) level and possibly 'knowledge' institutes (either public or private). The knowledge used in the design of the law and the instrument is likely to have focused on the technical aspects of the instrument.

Depending on the type of neo-classical instrument (such as a tax or a charge), the instrument is implemented, monitored and controlled at the national, regional or local level by executive institutions. The (stereotypical) role of private actors is that they are directly (as a target group of the instrument) or indirectly affected by the instrument. The distribution of resources (and thus of power) in these arrangements is uneven. (Central) Government agencies have legislative power and controlling power based on this law. The target groups of this policy do not have a formal role in the decision-making process of these

instruments and the laws they are based on. Besides, they do not hold crucial resources for the success of the arrangement. They may influence the decision-making process by means of lobbying or protests, either during the process or after implementation of the instrument, or by sabotaging the instrument. Based on this description, the ideal-type scheme of the policymaking process for this category of instruments can be presented as follows⁷⁷:

Figure 3.4: ideal-type arrangement for neo-classical steering instruments



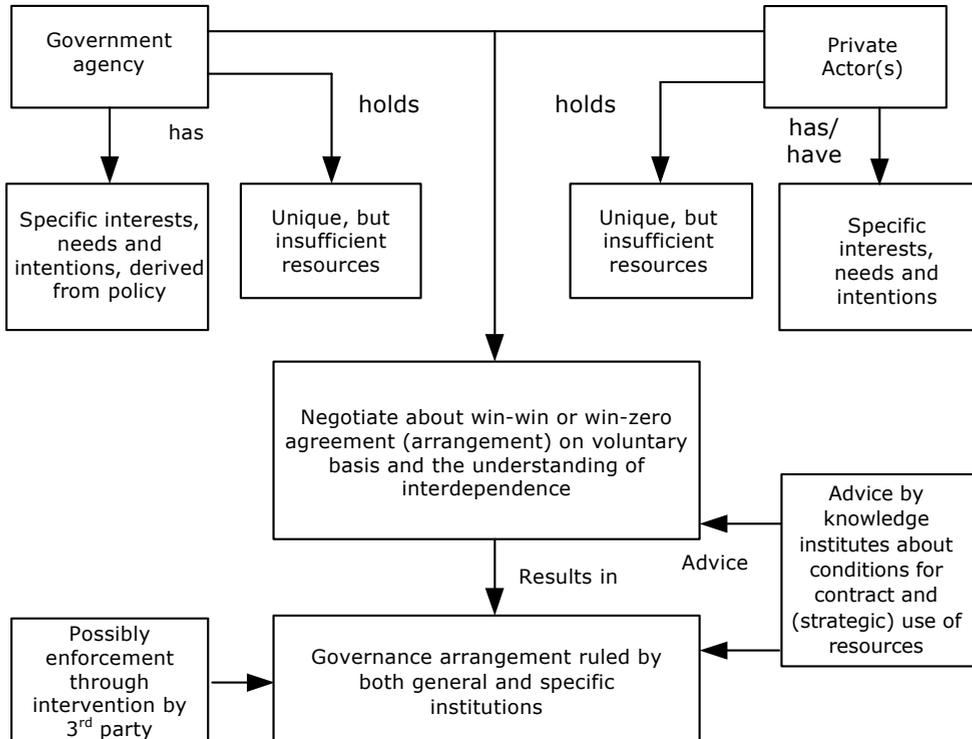
IDEAL-TYPE ARRANGEMENT FOR NEW INSTITUTIONAL APPROACHES

In the process of constructing a new institutional arrangement, both public and private actors are presumed to have an (direct and positive) interest in the arrangement. Besides, both public and private actors have unique resources needed for the arrangement. Therefore, both public and private actors depend on the other to fulfil their own interests. As a consequence, the preparation of, decision-making about and implementation of the arrangement takes place with (varying degrees of) involvement of public and private actors. Monitoring of the arrangement also takes place by both public and private actors. Both categories are keen on checking whether or not the other party lives up to the promises made. Any disagreements are settled by a third, independent party (usually the legal system). Compared to the arrangement involving neo-classical economic instruments, the role of private actors is more active in the construction and implementation of the arrangement. A reason for this is that the distribution of resources (and thus power) is more equal. There is no specific law regulating the arrangement. However, general laws may

⁷⁷ The arrows in this scheme and the following two represent a causal and temporal relationship.

apply. Based on this description, the ideal-type scheme of the policymaking process for this category of instruments can be presented as follows:

Figure 3.5: ideal-type arrangement for new institutional approaches



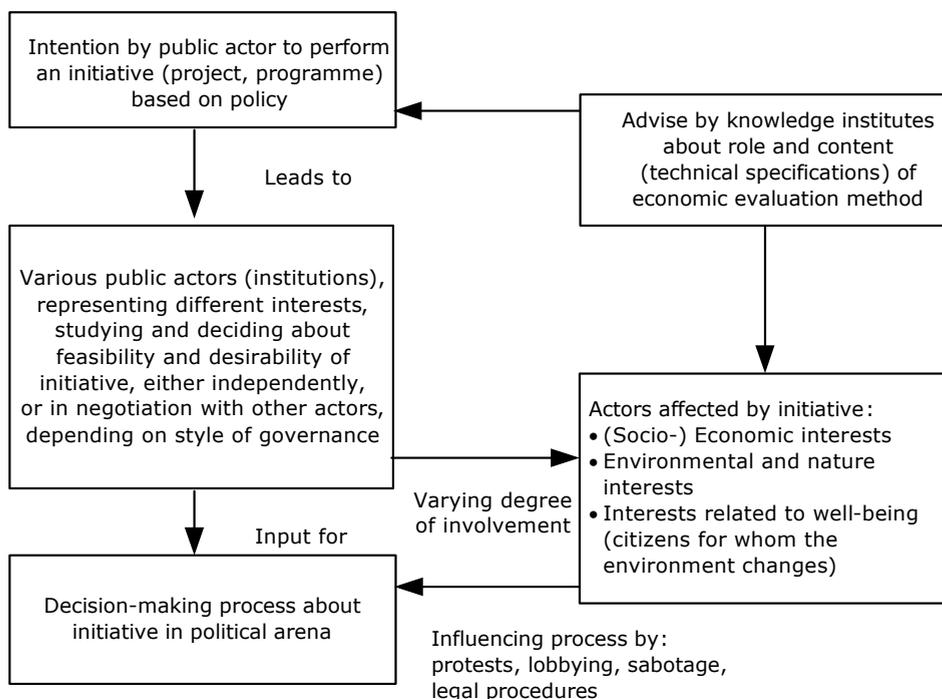
IDEAL-TYPE ARRANGEMENT FOR ECONOMIC EVALUATION METHODS

The driver of public projects is presumed to be a specific policy. The public project to be executed to fulfil this policy is usually based on a specific law enabling the project, especially when it's a project at the national scale. The initiative for, preparation of and decision-making about the project takes place by the (central) government. Depending on the style of governance, private actors (both citizens, business and representative organisations) may be involved in this process to varying degree, via formalised procedures. The project may be executed by the central government, be delegated to the regional (or local) level, or be executed in a public-private-partnership. The type of actor(s) performing monitoring and control, exploitation and maintenance of the project depends on the type of arrangement. The role of private actors in the economic evaluation of the public project is presumed to be limited. Actors affected by the project may have a formal role in the decision-making process (interactive, open planning process), but the impact of this involvement on the project is uncertain. The role of knowledge institutes (either independent (public or private) or government related) may be decisive, since they are relied upon for supplying knowledge

about the way to perform the economic evaluation. The discourse about the role and content of the economic evaluation method is presumed to take place mainly in the administrative and academic arena.

The distribution of resources is uneven. The political arena is presumed to hold decision-making power. As was mentioned above, knowledge institutions may hold crucial knowledge for performing (economic) evaluations. Individual actors (citizens or businesses) can only influence this process indirectly, by expressing their public opinion (for example via protests and sabotage). Representative organisations (such as unions, nature and environmental NGO's, representatives of business) are presumed to be able to influence the process via lobbying. All private parties (and even public ones other than the initiator) may try to influence the process via legal procedures (formal objections). Based on this description, the ideal-type scheme of the policymaking process for this category of instrument or method can be presented as follows:

Figure 3.6: ideal-type arrangement for economic evaluation methods



Based on the specification of the elements of the analytical framework and their relationships for the subject of this thesis in this chapter so far, the framework will now be made operational for empirical analysis in the next section.

3.7 MAKING THE ANALYTICAL FRAMEWORK OPERATIONAL

In this section, the analytical framework as introduced in chapter 2 and elaborated in this chapter will be made operational for an empirical analysis of policy arrangements in Dutch water management involving economic steering instruments or evaluation methods. Generally speaking, the purpose of empirical analysis in this thesis is to find factors that determine or influence the role and content of these instruments and methods in Dutch water management. Other, related purposes are to analyse if patterns exist in the way decision-making about these instruments and methods takes place and how the characteristics of these processes influence their outcome. In this section, it will be explained how these factors and patterns will be identified.

3.7.1 RESEARCH QUESTIONS TO BE ANSWERED BY EMPIRICAL ANALYSIS

In chapter 1, the main research question was formulated as 'what role do economic policy instruments and evaluation methods play in integrated water management in The Netherlands?'. In order to be able to systematically address this central question, it was divided into four sub questions, relating to (1) economic theory about economic policy instruments and evaluation methods, (2) analysis of the starting points, interpretation and implementation of integrated water management and the role of economic instruments and methods therein, (3) the theoretical and practical contribution of economic steering instruments and evaluation methods to integrated water management in Dutch water management, and (4) the explanation of this contribution. The questions relating to category (1) and (2) were answered from a theoretical perspective in this chapter. So far, the operationalisation of integrated water management into policy principles and concepts was addressed from a normative perspective, motivated by a specific view on the man-nature relationship. Whether or not these principles and concepts are dominant in specific policy arrangements in Dutch water management is a matter of empirical analysis. The operationalisation of these policy principles into other, more concrete elements of the policymaking process (such as policy goals, programmes and instruments) is also an empirical matter. The questions relating to category (3) have so far only been addressed from a theoretical perspective as well.

In the next chapters, the empirical aspects of the sub questions will be addressed. As was mentioned earlier, chapter four will analyse the presence of a number of (economic) elements of policy in EU- and Dutch water policy in a general sense (i.e. not necessarily directly related to specific issues), such as economic policy principles, policy goals and concepts, steering instruments and evaluation methods (see also figure 2.2). One of the purposes of the analysis in chapter 4 is to see if the key characteristics of integrated water management and the core principles and concepts to make it operational as identified in this chapter are reflected in economic elements of water policy at various levels. Chapters 5 and 6 will discuss how this policy is made operational in specific governance arrangements in Dutch water management. By comparing formulated policy with its operationalisation into

governance arrangements, it will become possible to analyse which elements of policy are actually performed. Besides, analysing governance arrangements is also expected to generate insight into why this is the case. The extent to which economic policy principles, instruments and evaluation methods are applied in Dutch water management can only be assessed when comparing it with some point of reference. In this thesis, three points of reference are used:

- (1) the theoretical range of application;
- (2) the range of application suggested by policy, and;
- (3) the application of these instruments and methods in other EU Member States.

These points of reference mainly relate to economic steering instruments. The theoretical and practical scope of evaluation methods is more difficult, if not impossible to assess. As was mentioned before, in principle, these methods are applicable to any public initiative. Therefore, with regard to these methods, the debate is less about the scope of application *per se* (the number of situations in which it can be applied) and more about the content (the range of effects covered and their relative weight).

The empirical part of sub questions 2 and 3 can be answered by comparing the use of economic policy instruments and evaluation methods for addressing various policy issues. These questions will be addressed by presenting the ranking of policy issues in water management on the political agenda, the way in which these issues have been addressed over time, the role economic instruments and methods play and have played in addressing these issues and the degree to which these economic instruments and methods were designed to meet starting points of integrated water management. Since this question is encompassing in nature, the answer to this question will be based on the total body of empirical analysis of this thesis.

The empirical aspects of sub question 4 ('How can the role economic steering instruments and evaluation methods play in Dutch water management be explained?') is somewhat different from the former ones, in that it does not address the extent to or way in which economic instruments and methods are applied, but rather the factors that determine if and how these methods and instruments are applied. This question is the main reason for developing the analytical framework in this and the previous chapter. While sub questions 2 and 3 can be indicated as 'how and what-questions' (an exploratory question), sub question 4 is clearly a 'why-question' (explanatory question). Answering this 'why-question' requires the analysis of policymaking processes regarding specific issues, which will be performed in chapters 5 and 6. In this section, it will be discussed how the elements of the analytical framework and their relationships will be identified and analysed in order to be able to answer this question. For a number of these elements, it will be argued in this section that specific manifestations or characteristics of these elements (i.e. specific impulses for change, specific discourses, institutions, actors and resources and specific selection criteria, belief systems, motives and interests) are especially important in identifying the factors that influence the outcome of these policymaking processes. However, before addressing the further operationalisation of the analytical framework, I will address some general aspects of the empirical analysis of this thesis.

3.7.2 GENERAL METHOD FOR EMPIRICAL ANALYSIS: PATTERN MODELLING

So far, the analytical concept of 'patterns' was mentioned once, but was not explained yet. Since the identification of patterns (with regard to the subject of research) is the main purpose of empirical analysis in this thesis, this concept will be addressed first. Pattern modelling is discussed in an article by Wilber and Harrison (1978) comparing the methodological basis of (neo-) classical economics (referred to by Wilber and Harrison as 'standard economics') and institutional economics. The authors state that 'to discuss the truth value of scientific propositions requires a consideration of models of explanation'. They also state that modern sciences, including standard economics, are differentiated only by differences in subject matter, not in method. The method of modern science is referred to as formalism. This method includes the notions of logical positivism and *a priori* rationalism. Formalism is a method that consists of a formal system of logical relationships abstracted from any empirical content it might have in the real world. It is characterised by the use of mathematics and by the development of an axiomatic, deductive structure. This method is essentially reductionist in nature. Likewise, the crucial element of positive economics is predictability. Since in positive economics the validity of a model is to be judged by its predictive ability, the realism of its assumptions or the static nature of its structure become irrelevant issues. For these reasons, assumptions made by positive economics are and have been widely criticised. For example, Heilbroner (1970: 36) states that a characteristic difference between the subject matter of the social and physical sciences is the inherently poor experimental quality of social phenomena. Unlike the physical sciences, the social sciences must attempt to generalise from open rather than closed systems. Therefore (and for other reasons), Heilbroner argues it is not realistic to base methods of social sciences on those of physical sciences, since this would attribute the model for social scientific analysis a false degree of determinedness, accuracy and predictability.

In contrast to modern sciences are scientific disciplines and schools that take holism as the starting point of understanding, interpreting, and explaining the reality that surrounds them. This holism, including pattern models and storytelling, expresses the belief that a change in subject matter requires a change in method. According to Wilber and Harrison, institutional economics and radical political economics, amongst others, fall into this category. Besides, they say, the holistic nature of institutionalism has ruled out other than incidental use of formal methods (ibidem: 71). Instead, institutionalists have engaged in a systematic form of storytelling, that Abraham Kaplan calls a 'pattern model' (see Kaplan, 1964). Whereas the inherent dynamics of the formalist approach leads to a steady state, according to Wilber and Harrison (1978: 71), institutional economics can be characterised as holistic, systemic and evolutionary. It is holistic because it focuses on the pattern of relations among parts and the whole. It is systemic because it believes that those parts make up a coherent whole and can be understood only in terms of the whole. It is evolutionary because changes in the pattern of relations are seen as the very essence of social reality. They further state that formal models simply cannot handle the range of variables, the specificity of institutions and the non-generality of behaviour. This holistic view is adopted in this thesis. Therefore, the objective of the empirical part of this thesis is not to test a formal, abstracted model, but to identify patterns of relations via a model of explanation, being the analytical framework developed in this chapter, in order to tell a systematic story about the object of analysis.

Holistic theories are essentially couched in the belief that the whole is not only greater than the sum of its parts, but that the parts are so related that their functioning is conditioned by their interrelations. For the holist, then, explanation of reality cannot be had through the application of universal laws, with successful predictions the only form of verification. Rather, an event or action is explained by identifying its place in a *pattern* that characterises the ongoing processes of change in the whole system (Wilber and Harrison, 1978: 73). Furthermore, in remaining close to the concrete reality of the system studied, the 'holist' researcher is in a unique position to perceive a wide variety of recurrent themes (for example the importance of informal institutions for decision-making, or objections of specific groups of actors to specific types of instruments or arrangements) that appear in a variety of contexts. A theme is more important the more links it has with other themes, because the holist wants to construct a model that emphasises the interconnectedness or unity of the system. These recurrent themes may take the form of an accepted practice, a cultural norm, or a particular mode of production that more or less conditions everything else, or some recognised social objective. It is such *recurrent themes* that will be looked for in the empirical analysis of this thesis. What Wilber and Harrison refer to as recurrent themes were thus far referred to as 'important or crucial factors' determining or influencing the content and role of economic policy instruments and evaluation methods in Dutch water management. The 'patterns' as referred to above can then be interpreted as the mechanisms through which these recurrent themes influence the outcome of decision-making, either or not via influencing other dimensions of the analytical framework. As such, a type of model may be constructed that is known as a *pattern model of explanation*. Such a model is constructed by linking themes in a network or pattern. Or, in the words of Wilber and Harrison, 'constructing a pattern model means looking for themes that express themselves throughout the system as a network of interrelations and describing these connections in a pattern'. Use of the pattern model appears appropriate when an explanation involves many diverse factors, each of which is (or could be) important; when the patterns or connections among these factors are important; and when these patterns can be observed in the particular case under study (ibidem: 80). This is judged to be applicable to the cases studied in this thesis.

3.7.3 STRUCTURE OF THE EMPIRICAL CHAPTERS

GENERAL AND CASE-SPECIFIC EMPIRICAL CHAPTERS

In the remainder of this chapter, I will explain how the research questions as addressed above will be answered via empirical analysis, making use of the analytical framework as developed in this and the previous chapter. For structuring empirical analysis, I will make use of figure 2.6. The empirical chapters (4 to 6) will be divided into two categories: a general empirical chapter (chapter 4) and two specific empirical chapters, each describing a case (chapters 5 and 6). In chapter 4, I will analyse the *status quo* with regard to economic elements in water policy, the desired state of water management and the role envisioned for economic steering instruments and evaluation methods in reaching that desired state (point of reference number 2, see above). This analysis will be performed at various levels of governance, ranging from EU-level to the level of water boards. In order to get an

impression of the position of Dutch water management relative to other countries with regard to the application of economic policy instruments for the purpose of integrated water management (point of reference number 3, see above), an overview will be presented of the application of economic policy instruments in water management in various EU- and EEA-countries. The *status quo*, the desired state and the foreseen role of economic policy instruments and evaluation methods to achieve this desired state are analysed via the identification of (economic) elements of water policy, such as policy principles, goals, programmes and instruments at various levels of policymaking and by comparing these levels with regard to these elements. The elements of policymaking as mentioned here are represented by element (h) in figure 2.6.

The purpose of the general chapter (chapter 4) is twofold. On the one hand, it aims to analyse the way in which policy for water management at high levels of governance (such as the EU and the national level) is made operational at these and lower levels of governance. The process of making policy operational can be regarded as going through a number of stages in translating abstract elements of policy (ideologies, goals, concepts, ideas and notions) into more concrete elements (such as laws, regulations, programmes and instruments), which can be used in the execution of that policy. Ideally, this means going through figure 2.4 from top to bottom. The main question in the analysis of the intended role of economic policy instruments and evaluation methods in European and Dutch water management is whether this role is in line with the concept of integrated water management.

On the other hand, via this analysis of the formulation and operationalisation of water policy at various levels of governance, chapter 4 aims to identify general factors influencing the role and content of economic policy instruments and evaluation methods in Dutch water management. 'General factors' (or themes) are here interpreted as factors that are not specific for one policy arrangement in water management. These factors are the exogenous factors as identified in chapter 2 (trends in nature, society and governance), developments in water policy and dimensions of policy arrangements that apply to various issues in water management at the same time. As discussed in chapter 2, 'impulses for change' may be exogenous or endogenous to the policy domain of Dutch water management. Exogenous factors (impulses for change) particularly relevant for the analysis of economic policy instruments and evaluation methods in Dutch water management are shock events such as floods, droughts, acute water pollution and alarming reports, changes in societal preferences leading to shifting demands with regard to the functions of water systems, and general trends in governance, such as deregulation, privatisation, liberalisation, calculability and economisation. Such impulses for change may lead to the developments in water policy and the constitution of generally valid dimensions of policy arrangements as mentioned above (which are both considered as endogenous factors of policymaking in water management). The institutions that are general in nature and thus apply to all or most aspects of water management will be analysed in chapter 4. Those institutions that are issue- or aspect-specific will be analysed in the more specific empirical chapters 5 and 6. Examples of issues or developments that are general in nature and thus apply to or cover all aspects of water management are the financing structure and the organisation of water management. Institutions relating to these issues may thus apply to all aspects of water management.

In chapters 5 and 6, the analysis of water management is taken a step further from the analysis of policy resolutions (chapter 4) to the analysis of specific, issue related governance arrangements in Dutch water management involving economic policy instruments or evaluation methods. It will be analysed how policy resolutions are and have been translated into governance arrangements for specific issues in water management, as a result of the influence of various categories of factors influencing this process. These factors may be any of the total range of exogenous and endogenous factors already mentioned. The combination of the exogenous impulses for change and the specific characteristics of the elements of governance arrangements are expected to lead to a specific institutionalisation of policy. The dimensions of the governance arrangement can be regarded as issue specific factors that are more or less directly and explicitly influenced by more general impulses for change. Therefore, there is a likely to be a strong relationship between the general factors identified in chapter 4 (general trends and developments, general elements of policy and general elements of the institutional framework) and issue-specific factors in chapters 5 and 6. The general factors of chapter 4 may act as themes influencing the specific arrangements analysed in chapters 5 and 6 through specific patterns of influence. The dimensions of the policy arrangement are represented by elements (b) to (h) in figure 2.6.

Chapters 5 and 6 can each be regarded as a single case, addressing water systems quantity and quality management⁷⁸, respectively. The governance arrangements addressing specific issues as analysed in these chapters serve to illustrate that case. In these chapters, the level of governance arrangements will act as the primary level for the analysis of elements of the analytical framework. In other words, the specific characteristics of the governance arrangement will determine to what degree the other two levels of analysis (exogenous factors and individual actors) will be analysed. For each issue addressed, a detailed analysis will be made of the specific factors influencing the choice for (economic) policy instruments and evaluation methods in that arrangement. These factors may originate from any of the three levels of analysis, varying from trends in society to the selection criteria applied by an individual (powerful) actor. In the analysis of the various issues, some (levels of) factors may prove to be more important than others, and as a consequence, not every factor or level of factors will be analysed equally extensively for each issue.

3.7.4 DEMARCATIION OF THE CASES

A number of explicit choices was made in the selection of the object of empirical analysis and in the demarcation of cases. The first was only to address issues in the water system (as opposed to the water chain). The second was to select 'economic instruments and methods for water systems quantity management' and 'economic instruments and methods for water systems quality management' as the two cases for this thesis. Both choices and distinctions will be explained below.

⁷⁸ The distinction between water systems quantity and quality management will be explained and motivated further below.

WATER SYSTEMS MANAGEMENT

The distinction in water policy and management between water chains and water systems is a common one. The water chain can be defined as 'the whole man-made system for collective preparation, transport and distribution of drinking water and the collective collection, transport, treatment and discharge of waste water'. The physical dimension of a water chain includes the complete infrastructure for the collective provision of drinking water via pumping stations, purification plants and a network of pipes on the one hand, and the collection and treatment of waste water through communal sewer systems and waste water treatment facilities on the other. A water system, on the other hand, is usually interpreted as 'an interconnected system of surface and ground water bodies'. It is often referred to as all 'free' or 'natural water', that is to say, all water that is not captured in artificial (man-made) systems not being part of natural ecosystems. In this thesis, a water system is interpreted as an interconnected system of surface water and ground water bodies *and* the vegetation that is part of these bodies and that is separated from other water systems by natural or artificial barriers.

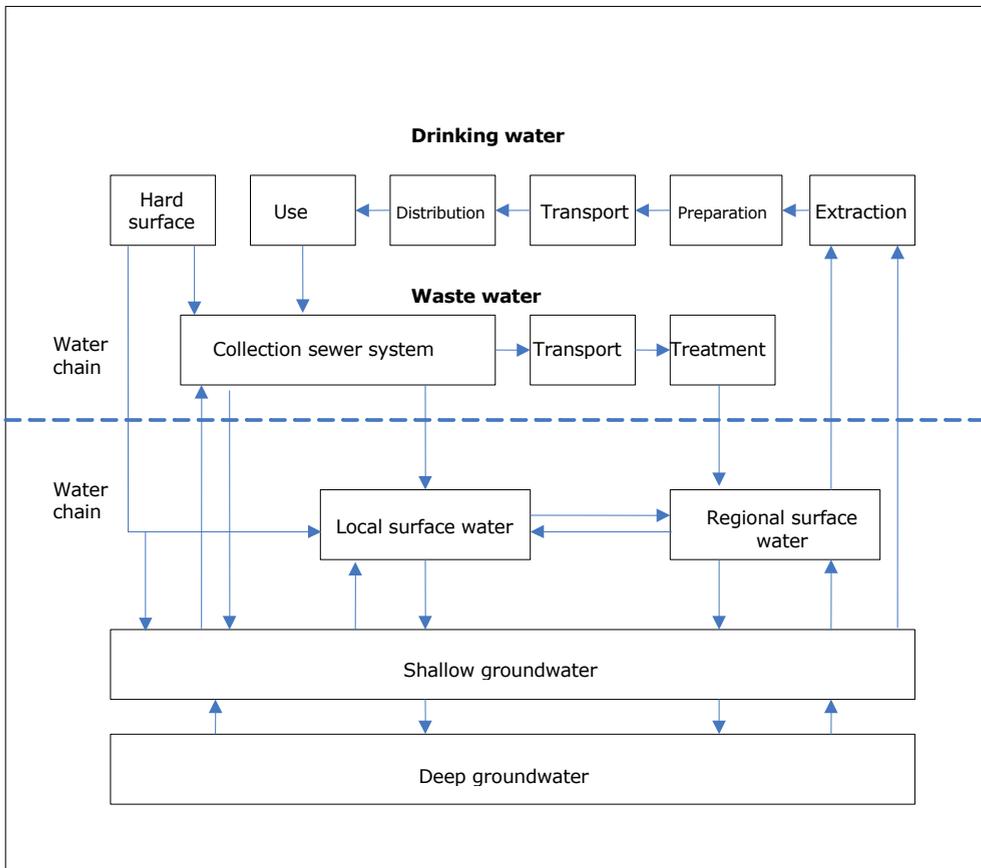
In this thesis, the focus is on policy instruments for water systems management. The main reason for choosing the water system as the object of study instead of the water chain is that the (potential) range of values and property rights related to free water and aquatic ecosystems is expected to be larger than in the water chain. Besides, it is expected that a larger range of actors can be indicated as stakeholders of water systems management. Therefore, the (potential) range of policy arrangements involving various types of economic policy instruments and evaluation methods is expected to be larger as well. Besides, the way these arrangements are designed is expected to have a larger impact on the contribution of these arrangements to integrated water management. In my perception of water management, this makes the comparison of different types of policy arrangements in water management a more interesting exercise, but also a more complicated one. As we will see later, this choice does have implications for the type of comparison of cases and the expected results of this comparison⁷⁹. Another important reason for studying water systems is the expectation that the interaction between various (economic) actors in society as a whole and water management in particular on the one hand and aquatic ecosystems on the other is expected to be larger than in the water chains. This facilitates studying the ecological dimension of integrated (or 'sustainable') water management. The combination of these arguments leads to the expectation that studying (the discourse about) economic aspects of water systems management will make a larger contribution to the generation of knowledge about the role of economic approaches to water management in achieving integrated water management than studying economic aspects of water chain management.

Although a distinction can be made between the water chain and water systems, as was done above, the water chain and the water system are, undeniably, connected. Activities (both private and public) in the water chain can and do have effects on both water systems

⁷⁹ See the discussion of literal and theoretical replication in the next subsection.

quantity and quality and vice versa⁸⁰. At several points in the water chain, interaction takes place with water systems (so called 'connection points' (*aanhaakpunten*)). Obvious points in the chain are the extraction of surface or ground water from the water system for the preparation of drinking water and the discharge of effluent from the wastewater treatment plant back into the water system. Other, less obvious, less controllable (and therefore less desirable), points are for example leaks in infrastructure for drinking water supply or the collection and transport of sewage, sewage overflows of combined sewer systems in case of heavy showers that exceed the collection capacity of the sewer system, and uncontrolled discharge of waste water by citizens or companies. In some of the arrangements addressed in the empirical part of this thesis, these mutual effects and the policies to deal with them will be analysed in terms of water systems management. The water chain and water system and their connections are depicted in figure 3.7 below.

Figure 3.7: water chain and water system, their elements and connections



⁸⁰ An example of the influence of activities affecting water systems on the water chain is the pollution of surface and ground water systems, which makes purification of water for the preparation of drinking water more expensive.

WATER SYSTEMS QUANTITY AND QUALITY MANAGEMENT

The distinction between water quantity and quality management is a common one in water management as well. Obviously, water systems quantity management addresses the quantitative regulation (distribution and control) of water systems, including flood protection and fighting droughts, while water systems quality management addresses qualitative issues related to water systems. It must be noted though that, just as is the case with water chain and water systems management, aspects (and issues) in water systems quantity and quality management often overlap and are often interconnected. An example of this interconnectedness is that a number of issues related to water quality management (such as salinisation) are caused by a specific approach to water quantity management (draining and pumping). These issues have sometimes evoked a specific reactive quantitative approach (such as flushing water systems with fresh water from elsewhere), which may in turn cause problems with regard to water quality. Some policy arrangements may thus relate to both quantitative and qualitative aspects of water management at the same time. As a consequence of this interconnectedness, not every policy arrangement can be clustered in one of the two categories. This is increasingly the case, since issues in water management tend to be more and more addressed in a holistic and combined manner. In fact, it can even be stated that the awareness of interrelations between different aspects of water management lie at the heart of the concept of integrated water management. Another objection to the distinction as described is that certain dimensions of policy arrangements may apply to both aspects at the same time. The same counts for a number of generic issues in water management⁸¹. A number of these 'generally relevant' dimensions of policy arrangements and issues in water management will be addressed in chapter 4.

The reason for making the distinction between water systems quantity and quality management anyway is that some of the elements of the analytical framework (impulses for change, the (dimensions of the) policy arrangements addressing issues regarding these facets of water management and the characteristics (such as beliefs, preferences, motives and criteria) of individual actors involved in these arrangements) are for a large part expected to be different for these categories. For example, water policy may specifically address water quality or quantity management. As will show from the empirical chapter, European water policy is mainly directed at water quality management. This policy sets ambient environmental standards, and leaves it largely to the discretion of Member States to formulate their own policy to achieve those standards. As such, the European policy level has a large impact on the operationalisation of water quality management in its Member States, including The Netherlands. In contrast, water quantity management is largely addressed at the level of individual countries. At this level, the focus in recent years has shifted strongly from a mix of demand and technological supply management towards spatial supply management. Since measures for supply management are often regional or local in nature, this calls for regional and local governance arrangements. As we have seen earlier in this

⁸¹ Examples of such issues are the financing and organizational structure of water management. Note that the fact that these issues relate to both aspects of water management does not necessarily mean that these issues are addressed through one policy arrangement. For example, financing and organizational issues are typically too complex to be addressed by one arrangement. Partly though, this also depends on the framing of the scope of policy arrangements.

chapter, such arrangements may be suitable for new institutional economic approaches. Such arrangements may also be considered suitable for achieving the ambient environmental standards as set by the EU, but some issues in water quality management may not be properly addressed via regional or local governance arrangements and therefore call for generic arrangements, either or not making use of neo-classical economic instruments. Such neo-classical economic instruments often address single issues, which may limit an integrated approach to water quality and quantity management via those instruments. Regional or local spatial arrangements, on the other hand, may enable a combined approach to water quality and quantity management. Whether this is true depends on a number of factors, such as the question whether or not the goals of water quality and quantity management can be combined and the degree to which the governance arrangements overlap in terms of discourses and required actors, institutions and resources. This is a matter for empirical analysis.

The systematic comparison of policy arrangements regarding water systems quality and quantity management and their dimensions are thus expected to yield factors influencing the application of economic policy instruments or evaluation methods that are characteristic for that aspect of water management. Besides, the comparison of policy arrangements based on this classical categorisation may provide insight into specific and different factors hampering the operationalisation of integrated water management. Finally, it may even serve to emphasise the need for integrated approaches (in this case combined water quality and quantity management) in certain situations by highlighting the shortcomings of one-sided approaches. Therefore, by knowing what are the characteristic similarities and differences of arrangements in water quantity and quality management, I expect to be better able to answer the questions what factors determine the application and content of economic policy instruments or evaluation methods in governance arrangements in Dutch water management, to what degree these arrangements presently contribute to integrated water management, and whether or not water quality and quantity management can be combined in one arrangement in order to get to a more comprehensive approach in water management.

Two main criteria were used for the selection of the cases 'application of economic policy tools and instruments in Dutch water systems quantity management' and 'application of economic policy tools and instruments in Dutch water systems quality management' and the specific policy arrangements that are part of these cases. Firstly, the cases should relate to policy issues in contemporary Dutch water management. Secondly, the policymaking process addressing these issues involves a discourse about the application of economic policy tools or instruments. Choosing the aspects of water systems quantity and quality management as the level at which to demarcate the cases and thus perform case study analysis is expected to result in the best balance between generality and specificity. By studying Dutch water management as a whole, it would become difficult to identify the dimensions of separate policy arrangements, since, as was already argued, these are for a large part issue specific. Besides, it would become difficult to identify factors influencing the policymaking process

regarding economic instruments and methods that differ between various aspects⁸² of water (systems) management. Since it is expected that the types of instruments suitable for separate aspects of water management will be different, it is interesting to compare factors between these aspects of water management. By studying individual policy arrangements in water management as separate cases, it would become complicated to generalise findings to the aggregate level of separate aspects of water management. The reason for this is that as a result of fragmentation of categories of issues, the similarities and differences between policy arrangements addressing issues within the same aspect of water management will become hard to identify. As such, it would become complicated to abstract the findings into a higher, more general level of abstraction. Besides, analysing policy arrangements for separate issues in water management without aggregating the results into an overarching level of abstraction is expected to lead to a large number of repetitions. Therefore, it was considered most suitable to take the level of separate aspects in water management as the 'case-level' and use policy arrangements addressing separate issues related to these aspects as input for the case.

After the case descriptions in chapters five and six, a cross-case analysis will be performed in chapter seven to infer and explain themes and patterns of relations between the elements of the analytical framework. For the purpose of performing a cross-case analysis, a careful selection of case studies is important. According to Yin (1994: 46), case studies should be selected in such a way that they either (a) predict similar results (literal replication) or (b) produce contrasting results but for predictable reasons (theoretical replication). In this thesis, the cases were selected for the purpose of theoretical replication. This choice is based on the assumption that more than one element of the analytical framework will differ for each issue in (and aspect of) water management (especially with regard to the level of dimensions of policy arrangements). When describing various policy issues in terms of policy arrangements, literal replication will therefore probably be impossible to find.

3.7.5 ANALYSIS OF GOVERNANCE ARRANGEMENTS IN DUTCH WATER MANAGEMENT

In this subsection, I will explain how the elements of the analytical framework and their relationships will be identified. Besides, I will explain which characteristics of each element and the relationships between elements are considered important for the identification of patterns. Because of the considerable variety of arrangements that will be studied in this thesis, it is not the goal of empirical analysis to construct a thoroughly validated pattern model as described by Wilber and Harrison (see earlier). This process is subject to a number of carefully defined steps that were not performed in the course of this research. For example, it would require the formulation of tentative hypotheses on the basis of previously validated themes. Although hypotheses were formulated on the basis of the theory as discussed in this chapter in the form of ideal-type arrangements for each category of economic instrument and method identified, these hypotheses were not based on themes validated in advance. Therefore, the aim of empirical analysis in this thesis is to recognise

⁸² Separate aspects of water systems management as identified in this thesis are 'water systems quality management' ('too dirty'), 'management of excess water and flood protection' ('too much'), 'management of water systems shortage' ('too little').

themes and patterns that can explain the application of economic instruments and methods in specific categories of policy arrangements that address specific (categories of) issues in Dutch water management. Below, I will discuss some examples of possible themes and patterns that may be identified through empirical analysis. These themes and patterns are based on the theoretical insights as discussed so far.

One such possible theme is the expectation that different actors will interpret the idea of improved efficiency in water management differently with different interests. As a consequence, it may be expected that the discourse focuses on the interpretation of this notion, instead of focusing on the way the degree of efficiency may be assessed. This in turn may focus attention on the normative discourse rather than on the strategic discourse regarding the issue. The consequence of this may be that the role and content of economic policy instruments or evaluation methods is not addressed at all in the discourse about efficiency (pattern). Another example of a pattern is that the confrontation of existing institutions with trends in society and governance leads to the construction of specific new arrangements that aim to meet these trends via (largely) the existing institutional framework. The theme causing this pattern could be the general phenomenon of change aversion, in which vested interests wish to maintain their powerful position in a policy domain while being faced with changes that call for new institutions and a new distribution of power among the actors involved. A third link between a theme and a pattern could be that the pervasiveness and 'momentum' of a specific trend (being the theme), such as economisation, forces actors that oppose to the trend or its consequences to adapt to this trend in an attempt not to block it, but to bend it (with 'adaptation' being the mechanism, or pattern).

The themes and patterns described above are presented as rather straightforward 'cause-effect' relationships. However, one can imagine that these cause-effect relationships may be more complex, involving a range of elements of the analytical framework and less unidirectional modes of influence. Besides, the number of themes and patterns one could think of on the basis of the theoretical part of this thesis is far greater than the examples presented above. Therefore, it is no use trying to be exhaustive in listing the possible themes and patterns here. Instead, the analytical framework will be specified in such a way as to facilitate the identification of the most important themes and patterns. For this purpose, in the remainder of this subsection, I will present a structure for a systematic analysis of policy arrangements in the empirical part of this thesis, based on scientific research questions derived from the combination of various elements of theory. Scientific research questions are questions based on theoretical insights and the analytical model that can be used for guiding empirical analysis, with the purpose of answering the main question(s) of the research. Besides, I will discuss which characteristics of dimensions, elements within dimensions and relationships between dimensions of the analytical framework are considered important for the identification of themes and patterns in single policy (or governance) arrangements and the comparison of these arrangements in the meta-analysis in chapter 7.

MAIN SCIENTIFIC RESEARCH QUESTIONS

On the basis of the discussion of themes and patterns above, a number of scientific research questions can be formulated that will be answered through empirical analysis. These questions are:

1. What factors are dominant in determining the role and content of economic steering instruments and evaluation methods in governance arrangements in Dutch water management, as studied in this thesis?
2. What similarities and differences can be identified with regard to these factors between the (categories of) arrangements studied?
3. Can these similarities and differences be explained by specific (combinations of) themes?
4. In what way do these themes influence the process and outcome of the arrangement, in other words, what is the pattern?
5. How do these patterns compare between the (categories of) arrangements studied?
6. What consequences do these patterns have for the contribution of economic policy instruments and evaluation methods in Dutch water management to integrated water management?

RESEARCH QUESTIONS GUIDING EMPIRICAL ANALYSIS IN THE CASES

In order to be able to answer the main scientific research questions as listed above, these questions have to be translated into questions guiding empirical analysis. These questions structure empirical analysis in the case studies and give guidance to the methods for data gathering. They are based on figure 2.6. The main research questions for empirical analysis in the cases are:

1. What issue is addressed?
2. Which actors are involved in policymaking regarding the issue?
3. What interests do these actors have?
4. How do these interests translate into a position regarding the use of economic policy instruments and evaluation methods?
5. What resources (and thus power) do actors have?
6. What strategy do these actors use to further their interests (in terms of the use of resources, including story lines)?
7. What story lines do the actor(coalition)s involved have?
8. What exogenous factors play a role in the policymaking process?
9. How do actors react on these exogenous factors with regard to their strategy in the arrangement?
10. What does the existing institutional framework look like (possibly as a consequence of the influence of exogenous factors)?
11. How does this existing institutional framework affect the 'field of power'?
12. What dominant discourse results from this 'field of power'?
13. What policy results from the dominant discourse?
14. How is this policy elaborated into a governance arrangement?
15. What is the role and content of the economic policy instrument or evaluation method in the arrangement at hand?

The way these questions will be answered through empirical analysis and which dimensions, elements and relationships in the analytical framework are considered particularly important in this process will be addressed in the text below. Estimations of the key characteristics of the policy arrangements analysed in the case study chapters needed for answering the main scientific research questions through the identification of themes and patterns are derived from the theoretical insights so far. The main elements of the analytical framework to be identified in empirical analysis are summarised in table 3.5 below. For a more extensive description of the elements of empirical analysis, I refer to Annex II.

Table 3.5: overview of aspects and characteristics for each dimension of the analytical framework

Dimension of arrangement	Aspect	Characteristics
Discourse	General	Type of discourse (ontological, normative or strategic?); Level (international, national, regional, local); Arenas (societal, scientific, political, administrative); Degree of consensus in arenas and discourses; Existence and stability of dominant discourse; Type of discourse (emphasis on similarities or differences?); About which goal? Focus (ecological, economic, social aspects, combination?); <i>Important discourses</i> : scale and time; Interpretation of integrated water management; Consequences of exogenous factors; Economic approach? (normative discourse); Selection criteria (esp. efficiency) and optimisation; (Institutionalisation of) Economic steering instruments and evaluation methods; Suitability of instruments and methods for integrated water management;
	Interpretation of policy issue	F.e. effects of society on environment and v.v.; matters of time and scale; spatial variation and differentiation; 'age' of issue;
	Impulses for change	Exogenous factors (societal and natural scientific trends, trends in governance, shock events); Endogenous factors (changes in Dutch water management);
Institutions	General	Degree of institutionalisation issue/dominant discourse; Type of institutions involved (formal, informal, process or content, general or specific); Institutions that regulate use of natural resources (institutional resource regime); Paradigms; Level at which institutions function; Flexibility (windows of opportunity); <i>Important institutions</i> : formal institutions: political rules (laws, norms), economic rules (a.o. property rights), contracts, elements of policy (such as policy principles); Informal institutions: paradigms, informal rules about the process;
	Policy for the issue	History of public policy; Phase in policy cycle; Number of policy alternatives; Primary and secondary policy goals; Position of issue on political agenda; Level at which policy is made and executed; Degree of concordance between intended policy and present policy; Stability of present arrangement; Effect of proposed economic steering instrument or evaluation method on present arrangement
	Decision-making process	Style of policymaking and execution and related consequences;
Actor coalitions	Actors	Number of actors; Degree of organisation/representation; Belief systems; Interests; Goals, Motives; Position wrt. economic instrument or method;
	Actor coalitions	Existence of coalitions; Degree of organisation of coalitions; Degree of concordance of interests and strategies;
Power and resources	Resources (general)	Distribution of resources; Influence of exogenous factors on distribution and use of resources; Crucial/dominant resources? Important resources: institutions, information, story lines, financial means, protest;

Strategy (of actor coalitions)	Risk strategy; Strategic use of resources; Focus of resources on aspect of arrangement (discourse, institutions, relationships)
Storylines	Use of concepts and other elements of policy in story lines; Focus in story lines (technical/political suitability, required institutions, fundamental or pragmatic arguments); Use of paradigms
Power	Power balance (distribution of power in process) as a consequence of the combination of elements above; What dimensions of the arrangement determine power balance?

CHARACTERISATION OF DIMENSIONS OF THE ANALYTICAL FRAMEWORK

For a systematic description and analysis of policy arrangements, the case descriptions consist of a number of steps, each describing a dimension of the framework or (a combination of) relationships between these dimensions. The reason for identifying exogenous factors before identifying the discourse-dimension of the policy arrangement is that these exogenous factors influence the dimensions of the policy arrangement primarily via discourse. For similar reasons, the identification of the use of selection criteria by various actors is regarded as a step in the identification of the discourse-dimension, to be identified before the discourse is addressed as a whole. The reason for this is that the selection criteria used are a reflection of the strategy of the actors involved and as such can be an explanation of the story line used. It can be argued that the impulses of change as described earlier this chapter are likely 'themes' influencing the decision-making processes of the arrangements studied. Therefore, specific attention will be paid to the identification of these impulses further below.

In the remainder of this subsection, I will discuss the way the elements of the analytical framework and possible relationships between these elements will be characterised in empirical analysis. This characterisation includes the identification of secondary elements or specific manifestations of these elements, specific characteristics of these elements to be identified and the possible categories for this characterisation. These steps are schematically represented by Annex II.

Characterisation of the policy issue and public policy addressing the issue

In the first step, the example at hand will be characterised by describing the policy issue being studied or the policy issue the example is part of. Part of the description of the policy issue is the way the issue has been and is to be addressed through public policy. This overview includes the description of the level at which the issue has been addressed through public policy and an initial description of the content of this policy in terms of elements of policy such as principles, concepts, programmes and instruments. These elements of policy consist of the elements as identified in chapter 2. This (historic) overview of the elements of policy is part of describing the existing institutional framework, which will be discussed later. The degree of institutionalisation of a policy issue is expected to be an indication of path dependency and incremental change. Besides, it is an indication of the stability of an arrangement. By presenting an overview of policy over time, it is expected that the influence of various impulses for change (such as consecutive styles of governance) on the arrangement can be identified.

Other important aspects for characterising the issue are the position of the issue on the societal and political agenda, the degree to which the issue is location bound and the spatial and temporal scale of the impact of the phenomenon addressed. The position the issue has on the societal and political agenda is an indication of the sense of urgency to address the issue. This sense of urgency is caused by the (perceived) impact of the issue on society, which may be influenced through discourse. It is expected that a high sense of urgency may lead policymakers to choose an unconventional pathway, bypassing regular decision-making institutions. This may lead to new types of arrangements.

Important aspects for characterising public policy addressing the issue are the object of policy, the primary policy goal, the basic strategy (public initiative or influencing behaviour of private actors), the instrument or evaluation method at stake, the level at which policy is made, the phase the policymaking process is in, the level at which policy is implemented and an initial indication of the concordance of the suggested policy. Generally speaking, the primary and secondary goals served by the instrument or method are important characteristics of the arrangement. These goals may determine how the instrument or method is designed, and which role it is (thus) intended to play. Serving a specific goal means serving a specific interest. This interest may be the interest of a small group of actors or the interest of a majority of the actors in society. Besides, the instrument or method may negatively affect other interests. Therefore, the goals (to be) served and the (corresponding) design of an instrument or method may for a large part determine whether an actor accepts or rejects the use of the (economic) instrument or method.

The importance of the instrument or method for characterising the arrangement

The method or instrument involved in the arrangement will be the starting point of further empirical analysis in the case examples. It is the object of study that will determine the identification and analysis of dimensions of the analytical framework and relationships between these dimensions. For example, the economic method or instrument will help in distinguishing primary from secondary stakeholders. The actors directly involved in the decision-making process about the implementation or use of the economic tool or instrument are considered to be primary stakeholders, the other stakeholders are considered to be secondary stakeholders. With regard to the economic evaluation method or policy instrument being studied, the following steps will be taken:

The first step is a description of the *phase* the decision-making process is in. Questions related to this step are:

- Is the economic tool or instrument being suggested or already being used?
- Were studies performed to assess its feasibility?
- Is there consensus about the application of the instrument or method?
- Has the application of the instrument or method been laid down in formal institutions?

The identification of the phase the decision-making process is in is expected to give insight into the stability of the arrangement. This stability indicates whether there is consensus or a (strongly) dominant discourse about the application of the method or instrument and the degree to which the method or instrument has been embedded in an institutional framework. The degree of consensus can be assessed in more detail by analysing the discourse, which will be described later.

The second step involves an assessment of the *level of governance* at which the instrument or method is suggested and the level at which it will operate. Together with the type of instrument or method involved, the phase the decision-making process is in and the level at which the instrument is suggested and is to be implemented are expected to have a large influence on the types of actors involved and the (type of) discourse being held, and thus on the type of policy arrangement and the resulting governance arrangement. The level at which policy initiatives are taken may influence the type of arrangement and/or instrument/method either by imposing this type of arrangement on other actors, or by formulating policy in such a way as to pre-select on a specific type of arrangement or instrument/method. This pre-selection may take place via the issuing of specific policy related institutions, such as policy principles, concepts, programmes or laws. The level at which policy is formulated and implemented is expected to determine whether the arrangement is horizontal or vertical in nature, which is regarded as an indicator for the complexity of the arrangement. With regard to economic methods for policy evaluation, the level at which an instrument will operate addresses the geographical scope for which the method is used and with regard to economic steering instruments, this addresses both the level of governance at which it will be implemented and the economic sector(s) that will be addressed by the instrument (the target group(s)).

Characterisation of actors, their interests and their (corresponding) position towards the role and content of the economic instrument or method at hand

In the next step of the description of examples in the cases, a closer look will be taken at the stakeholders involved in the process of policymaking and implementation. This description includes the identification of the number of actors involved (divided into public and private actors, the characterisation of their position (primary or secondary actors) and their degree of organisation and representation. Besides, this step involves the characterisation of the belief systems of these actors, their interests in the issue, their (formal and informal) goals, the effect of the (proposed) policy on the achievement of these goals, their position with regard to the proposed instrument or method and their motives for this position. These characteristics of individual actors are important precursors for the content of the discourse (via their story lines). Combined with their power position, their interests and motives also condition their strategy in the arrangement. An important characteristic of actors in the scope of this thesis is their level of ambition with regard to sustainability (intra- and intergenerational equity, sustained availability of resource(s), health of aquatic ecosystems). This level of ambition can be expressed in terms of the policy paradigm for the man-nature relationship. The characterisation in terms of these paradigms is also an indication of the risk seeking or avoiding nature of the actor. Adhering a weak sustainability paradigm is likely to lead to a rejection of economic steering instruments, since, as was discussed earlier this chapter, these instruments provide a continued (dynamic) incentive towards (more) environmentally friendly behaviour.

Motives of individual actors may be either opportunistic or ideological in nature. It is assumed here that in case actors act on the basis of pragmatic motives, it will be easier to strike compromises in the arrangement. Ideological motives are more fundamental and thus harder to change. As a consequence, the policymaking process is more likely to result in actor coalitions being diametrically opposed and not willing to give in. If this is the case, centralistic arrangements are expected sooner to lead to a stalemate than decentralised

arrangements, since the requirements for a well functioning neo-classical instrument are higher, and therefore there will be less room for negotiation.

With regard to the acceptance of a proposed instrument or method, it is also important to identify the type of actors positively or negatively affected by the instrument or method. Important characteristics in this respect is how many actors are involved in the policymaking process, whether one group or several groups of actors are affected, whether or not the groups affected are well organised, whether they have a strong common interest or dispersed interests and whether or not various groups of actors (are able to) form policy coalitions. Combined with the resources available to the actors involved (see below), these characteristics are expected to determine the amount of power actors have to determine the outcome of the policymaking process. The personal belief systems, interests and motives of actors involved are believed to be expressed in the criteria these actors use for the selection of policy strategies and policy instruments and methods. The criteria emphasised and specific interpretations of the score of various instruments on these criteria as expressed by various actors in their story lines in turn are expected to play an important role as arguments in the discourse about these instruments and methods.

Identifying discourses and their influence on the resulting policy and its operationalisation

The next step in the description of the policy arrangement is the analysis of the discourse about or related to the economic method or instrument at hand. As was discussed earlier (see figure 2.6 and the related text), the link between elements of policy, the criteria used for their selection and other dimensions of policy arrangements mainly runs via discourse. Identifying the various story lines with regard to the issue being discussed gives an indication of the (conflicting) policy paradigms that underlie these story lines, while identifying the more explicit elements of policy helps identifying the dominant discourse in the policy arrangement. As was argued before, the influence of elements of policy on other elements of policy can go both ways. Because of this interaction, the identification of these elements and the role they play in various discourses (both the strategic and the ontological and normative discourse) is considered important for the role and content of economic policy instruments and evaluation methods.

The analysis of discourse may include a range of steps and aspects. Firstly, discourses can be held about various types of subjects. Relevant subjects in this thesis are discourse about time and scale, the interpretation, operationalisation and implementation of integrated water management, the consequences of exogenous factors, economic policy approaches, selection criteria and optimising and the interpretation of efficiency. Secondly, for each type of discourse, various characteristics may be relevant, such as the policy goal that is addressed by the discourse, whether the discourse is ontological, normative or strategic in nature, at which level of governance and in which arena the discourse is held, whether the discourse highlights similarities or differences between actors, whether the discourse focuses on the ecological, economic, environmental, social or cultural aspects of an issue and the degree to which there is consensus in discourse. With regard to the story lines used by various actors, the following aspects are considered relevant: the number of story lines in a discourse, the use and interpretation of elements of policy, the focus of these story lines (on optimality, concordance, required institutional framework) and the paradigms that underlie these story

lines. The characteristics of the specific discourses mentioned above considered relevant for empirical analysis are further specified in Annex II. The levels of governance and the types of arenas in which the discourse is being held can be regarded as structural characteristics of the discourse. The policy level(s) at which the discourse is held will mainly depend on the level at which the method or instrument is suggested and designed and the level at which it will operate (see earlier). The levels at which and arenas in which a discourse is being held may be an important part of explaining the outcome of the policymaking process, since each level and arena has its specific actors, which in turn have specific interests, resources, power and strategies.

Analysis of the discourse is expected to yield insight into the question whether or not there is a dominant discourse. Moreover, it will be assessed whether or not this discourse is stable, or, in other words, whether or not there is either consensus in the discourse or the presence of a very dominant (coalition of) actor(s). Besides, it gives an indication whether the discourse focuses on the application of the economic method or instrument itself or a different discourse, and whether or not the method or instrument addressed plays a direct or indirect (or even marginal role) in these discourses. This also holds for the concept of integrated water management.

Identifying specific discourses

From the theoretical discussions of economic policy approaches and integrated water management in chapters 1 and 2, a number of discourses can be identified about the role and content of economic policy instruments and evaluation methods that are specifically relevant for this thesis. These discourses will be discussed in more detail below.

Discourse about selection criteria and optimising

Based on a theoretical discussion of markets and market-based instruments, a number of preconditions was formulated earlier this chapter that would have to be met in order for markets and market-based policy instruments to operate properly in Dutch water management. Based on theoretical insights the conclusion was already drawn that these conditions will never be achieved in reality. It is presumed in this thesis that this situation is known by the actors involved. Therefore, it is expected that the choice for market approaches and economic policy instruments will not be based on their theoretically optimal functioning, but on their expected contribution to policy goals via 'optimising'⁸³, compared to the expected contribution of other types of policy instruments. The fact that the instruments will not function optimally will reduce their theoretical advantages over other types of instruments, which may in turn lead to a focus on other characteristics of economic policy instruments in the discourse about their functioning. Each group of actors is expected to have its own ranking of criteria and its own notion of the performance of the instruments considered for each of these criteria. The discourse about various characteristics of the policy instruments considered is expected to result in a dominant (discourse about the) ranking of selection criteria for the choice of instruments in the policy arrangement. In turn, this dominant ranking of selection criteria, and the (expected) performance of each instrument on each of these criteria is expected to lead to a dominant judgement about the type of policy instrument to be implemented or the application of the policy instruments considered.

⁸³ Optimising (Wilson, 1989) can be interpreted as a situation in which a policy instrument is designed in such a way that it leads to optimal (i.e. maximal) results under sub-optimal circumstances.

Analysing the discourse about selection criteria and the story lines used within this discourse is expected to lead to insights in the motives of actors to support or object to the introduction of new markets and the regulation of new and existing markets by making use of economic policy instruments and evaluation methods in water management. Besides, by combining the analysis of story lines, motives and resources, the strategies of actors involved can be identified. Analysing the motives of actors for advocating or opposing to these instruments or methods will generate insight into possible hidden goals of these actors, either or not related to integrated water management. Since policy arrangements are different for each issue addressed, the criteria used and their relative importance in the policy discourse are expected to differ for different policy arrangements in Dutch water management as well. The selective use of selection criteria may be explained by opportunistic behaviour of actors involved. In other words, the use of specific selection criteria and specific interpretations of these criteria may depend on the situation and the way in which actors are best able to represent their interests in that situation. Whether this is true needs to be assessed by empirical analysis.

Since neo-classical steering instruments have high demands with regard to the technical design of the instrument and the arrangement it is part of, it is expected that opponents of such instruments will focus their attention on those criteria on which they think these instruments score badly. Since target groups of these instruments do not have a (direct) positive interest in the arrangement, combined with the fact that there is little room for compromise, it is expected that actor-coalitions in these policymaking processes are more likely to be diametrically opposed than in policymaking processes about decentralised arrangements involving new institutional approaches. In decision-making processes involving economic evaluation methods, the discourse is expected to take place for a large part in the scientific arena. In this arena, the focus is likely to be on fundamental, paradigmatic aspects of economic evaluation. Therefore, actors in the scientific arena are not likely to strike compromises. As a consequence, the way economic evaluation methods are performed will depend on the question whether or not the primary actors (the public initiator) chooses in favour of one perspective and as such institutionalises this perspective as the dominant approach.

Discourse about efficiency

Efficiency was identified earlier in this chapter as one of the major merits ascribed to economic steering instruments. It can therefore be regarded as an important selection criterion in this thesis. Therefore, the identification of the discourse about this criterion is addressed here as well. Based on the preconditions of integrated water management, it was concluded that efficient use of public and private (financial) resources cannot be regarded as a primary goal of integrated water management. Efficient use of water and the goods and services of aquatic ecosystems can. Efficient use of public and private resources may be a derived, general policy goal, giving rise to trends in governance towards deregulation, calculability, privatisation and liberalisation. Based on this conclusion, it is expected that the argument of efficiency will be used for serving diverging, maybe even opposite interests in water management. On the one hand, private economic actors will use efficient allocation as an argument for increasing use of the market mechanism, thus reducing the public budget for water management (and the tax burden for these private economic actors) and/or furthering personal commercial interests. On the other hand, public and other private actors

(probably mainly NGOs) may interpret efficiency as efficient use of water, to be used as an argument to reduce pressure by society on aquatic ecosystems resulting from a demand for water and ecosystem goods and services and from pollution and destruction. The first argument for efficiency addresses the use of public financial resources (and thus tax money), while the second addresses efficient use of water and the natural resources provided by aquatic ecosystems. The diverging interpretation of the efficiency-criterion is the first theme that can be identified in this respect. The second theme is that actors may consciously or unconsciously (try to) focus their story line on the efficiency criterion, thereby possibly precluding discourse about the primary goal in water management. The actors focusing their story lines on the primary and those focusing on secondary goals in/of policy may often be the two main opposing 'camps' in discourse.

Discourse about and institutionalisation of economic policy instruments and methods

Another conclusion drawn earlier in this chapter was that the valuation of costs and benefits of the generation, destruction and use of (goods and services of) aquatic ecosystems in principle contributes to integrated water management. Based on this conclusion it is expected that the application of market-based instruments for environmental policy and methods for nature valuation in water management contributes to the valuing and thus the weight of the environment (more particularly aquatic ecosystems) in economic decision-making processes. As such, these instruments and methods contribute to integrated water management⁸⁴. These decision-making processes refer both to decisions by economic actors in markets and to decisions by public authorities regarding public projects and policy programmes related to water management. Two of the trends discussed so far were that towards scientification and its economic pendant economisation. Both trends can be shared under the common denominator of 'rationalisation'. As was argued before, the latter leads to an increase in relative importance of elements of policy, including policy instruments, related to economic goals over elements of policymaking related to other types of goals. Based on this expectation, the following proposition can be made: considering the general trends towards scientification and especially economisation, policy instruments and evaluation methods that influence economic decision-making processes will increase in relative importance. Therefore, it can be expected that stakeholders in water policy that have other than economic goals will increasingly adapt to this trend by trying to reach their goals via influencing these economic decision-making processes. This process can be referred to as the theme of 'adaptation'.

However, it was also discussed that these economic steering instruments and evaluation methods are relatively new compared to traditional command-and-control instruments. Therefore, it is expected that there will not be consensus yet with regard to their role and range of application. This lack of consensus is partly caused by uncertainty about their real effects and controversy about methodological issues. In other words, these methods and instruments have not yet been fully institutionalised in policymaking. It can be expected that this situation will lead to heavy debate about the design and application of these

⁸⁴ It must be noted that this contribution is conditional upon the use of economic approaches to societal phenomena. If in the dominant discourse an economic approach to societal phenomena is considered desirable, it is crucial to incorporate the costs and benefits of aquatic ecosystems in the calculations. However, this does not automatically mean that an economic approach to these societal phenomena is accepted by everyone as the best alternative.

instruments. This debate is likely to lead to compromises about their range of application and their effectiveness and thus to a sub-optimal application of these methods and instruments. The theme related to this hypothesis is that a shift may be observed in policymaking from the perspective of public actors from optimising the result of policy with regard to specific policy goals towards optimising the policymaking process in terms of participation and support. This theme would manifest itself in Dutch water management as a preference for decentralised arrangements as opposed to centralistic ones. This preference is in line with the general trend in governance towards deregulation and subsidiarity. The difference in outcome of these different approaches in terms of achieving the primary policy goal (the traditional interpretation of 'effectiveness of policy') is not obvious. The approach focusing on process may initially require more time and resources, but later on may accelerate the policymaking process because of a broader and stronger support among various stakeholders. Besides, these arrangements may score better results in terms of 'societal utility'. Whether this is true is not the subject of this thesis.

The analysis of the discourse about the use of economic policy instruments and evaluation methods in water management will include the institutionalisation of that discourse. This analysis includes the description of the degree to which this institutional framework provides general guidelines (rules) for the design and scope of application of these instruments and methods. Besides, it includes an analysis of the way the instrument or methods was implemented as a result of the outcome of the power struggle in the policymaking process. The latter aspect is expected to lead to insights into the degree to which the instrument implemented is a compromise to its optimal functioning.

Discourse about the suitability of economic instruments and methods for addressing issues in water management and their contribution to integrated water management

Earlier in this chapter, it was argued that the neo-classical type of market-based instruments is, in principle, suitable for allocation of goods and services in situations of relative scarcity. One of the preconditions for their proper functioning is that the property rights of the good addressed by this type of instrument are well defined. This may be the case for ground water, drinking water, and a number of natural or man-made products and substances addressed by environmental policy. However, the property rights of surface water are less likely to be well defined, whereas this 'type' of water may be relatively scarce in The Netherlands as well. It was also argued that in situations of water excess, it is not water or related natural resources that depend on the availability of water that are relatively scarce, but rather the land and capital threatened by it, the public resources to address the issue of excess water and the land considered necessary to adopt a spatial approach to excess water. Whether or not the property rights of these goods are well defined and whether these goods enable a market based approach in water management is still a matter of debate. The question raised in various arenas related to this matter is what market principles, market-based instruments and economic evaluation methods could be used to address situations of excess water (and thus scarcity of land, capital and public resources).

This discourse about the suitability of economic instruments and evaluation methods for various aspects of and issues in Dutch water management will be analysed by identifying the main policy issues in water management, especially the issue of dealing with excess water, and the policy instruments suggested for and applied to these issues. This analysis will show which instruments and methods are suggested for and applied to each aspect or category of

issue, what the story lines in the discourse about the use of policy instruments and evaluation methods are and whether a dominant discourse exists. The assessment of the suitability of a specific economic approach to an issue will be addressed via the discourse about its advantages and disadvantages (concordance) and the suitability and ease of its implementation (optimality).

Identification of impulses for change and their influence on the arrangement

In the description of the identification of impulses for change, three categories, being societal and natural trends, trends in governance and shock events, will be addressed separately, since they are expected to influence the use of economic instruments and methods in different ways. Whereas trends in society, trends in natural phenomena and shock events can (to a certain extent) be regarded as autonomous developments on which policymakers have to react (i.e. as true exogenous factors), trends in governance are, in principle, ways to react to these autonomous developments, especially to changing preferences in society with regard to the balance between state, market and society in dealing with societal issues. Therefore, these trends in governance are somewhere in between the categories of exogenous and endogenous factors. Just as with regard to the influence of actors and institutions on the role of (economic) instruments and methods, it can be argued that discourse plays a central role in the influence of impulses for change on a policy arrangement. Various actors involved may have different perceptions of the consequences of impulses for change for water management as a whole and the use of economic instruments and methods in particular. Besides, they may have different perceptions of the urgency to react to these impulses and the way to react. These specific interpretations may act as arguments in story lines used by these actors to influence the discourse.

The impulses for change as identified in this thesis are expected to be an important category of themes influencing policy arrangements in Dutch water management. These impulses may be more relevant for one aspect of water management than for another. Besides, they are likely to have a different impact on each aspect, in terms of the type of arrangement applied and the way the arrangement is constructed. For example, the trend towards internationalisation may lead to general guidelines with regard to water quantity management, leaving the detailed elaboration of these guidelines to the riparian states of river basins. The reason for this may be that each basin has its own characteristics, which makes it difficult to stipulate detailed generally applicable guidelines for water quantity management. In water quality management, supranational institutions (such as the EU) may stipulate more detailed guidelines, since, in principle, all pollution is the same, and states should be treated equally (creating a 'level playing field'). In the empirical part of this thesis, therefore, special attention will be paid to the specific impact various impulses (trends and shock events) have on different aspects of Dutch water management and types of arrangements. In the discussion of the empirical results in chapter 7, it will be analysed whether or not certain patterns can be distinguished in this respect.

In a general sense, important characteristics of these impulses of change are their influence on each of the types of discourse identified in this thesis and their impact on the distribution of resources. An important relationship between trends in society and nature and trends in governance is the perspective from which trends in governance are legitimised. This is likely to be the reference towards a trend in society or nature. Below, the identification of a

number of specific exogenous factors and their possible impact on policy arrangements will be discussed in more detail.

Identification of societal trends and their influence on the use of economic instruments and methods

The influence of long-term societal trends on the policymaking process is expected to be reflected in the way various elements of the policymaking process are designed in order to react to these trends. An example is the trend towards scientification. This trend refers to the increasing dependence on experts and expert systems, both in society as a whole and in policymaking in particular. In the scientific arena, quantitative sciences are dominant over qualitative sciences. The influence of the scientific arena on the political arena can therefore be expected to lead to attempts towards quantification of policymaking, resulting in a demand for quantitatively formulated policy goals and/or for methods for policy evaluation that can measure the results of policy in quantitative terms. Similarly, the demand for greater efficiency (economic accountability) in the public domain, which may be the result of various (combined) trends, such as scientification, deregulation and political modernisation, is likely to result in a demand for policy programmes and instruments that leave more regulative and allocative processes to the market mechanism and for methods for policy evaluation that address these markets and express effects in monetary terms. In other words, in the light of this trend, more emphasis will be placed on efficiency as a selection-criterion in the design and use of policy instruments and evaluation methods.

Besides the manifestations mentioned above, the influence of long-term trends on policy will be expressed in the relative importance assigned to specific policy principles and other elements of policy. For example, the trend towards economisation can be seen as a specific expression (manifestation) of both the trend towards quantification (which in turn is part of the larger trend of scientification) and the trend towards accountability of public policy (which in turn is part of a larger trend of political modernisation). Dominance or a large influence of this trend is likely to lead to a focus on economic elements of policymaking, such as economic policy principles, steering instruments and evaluation methods. In this example, this trend serves two larger trends, in turn serving various (possibly diverging) interests. Since trends in society and nature are expected to play a large role in constituting the content of story lines, the influence of these trends can also be identified by analysing story lines used by several actors for expressing their view or opinion about a policy issue and the way this issue should be addressed through policy. The language used by actors is expected to contain references to these long-term trends and is expected to express the opinion of these actors about their desirability and the way they should be addressed or operationalised through policy. The identification of specific trends will be addressed further below.

Possible influence of trends in governance on the types of instruments used

The economic steering instruments for environmental policy as presented earlier in this chapter (see a.o. Opschoor and Turner, 1994) can be regarded as 'traditional' broad sweep, centralist economic instruments originating from neo-classical economics, fitting well in the early stage of political modernisation. Besides, they are in line with the policy paradigm of 'environmental protection'. However, if policy coalitions in Dutch water management have broadened, as is argued in section 3.2, or the policy arrangements have evolved from corporatist to liberal arrangements, the national governments may no longer have the

resources and therefore the authority and legitimation to implement centralist economic policy instruments. As a consequence, they may need to switch to different types of policy instruments more suited to such an approach to governance. For such liberal arrangements, instruments based on new institutional economics may be considered as more suitable. The identification of the broadening of policy arrangements and political modernisation in the form of a shift from corporatist to liberal arrangements (which can both be indicated as themes) in governance arrangements in Dutch water management and their consequences for the use of economic policy instruments and evaluation methods is therefore an important point of attention in this thesis. A detailed description of the identification of specific societal trends, trends in governance and shock events, their interaction and their resulting impact on arrangements in Dutch water management in terms of the use of economic instruments and methods will be addressed below.

Identifying specific trends in society and governance

The impulses for change as identified by Wiering and Immink (2003) and the trends identified by Arts et al. (2001) earlier in this chapter will be taken as a reference for the identification of specific trends in society and in governance. According to Arts et al. (2001), with regard to *political modernisation*, the trend is one towards a stronger involvement of markets and the private community in serving public interests. The trend towards more market regulation is often explicitly mentioned in policy resolutions. This trend is often referred to via the concepts of liberalisation and privatisation. Besides, it was argued above that this trend is represented by referring to the need for greater efficiency in policymaking and by policy principles and selection-criteria such as 'cost-effectiveness', 'efficiency' and 'a level playing field'. Generally speaking, this trend is translated into policy principles that are risk-seeking in nature, in contrast with the trends of ecological modernisation and the emergence of post-material values, which are likely to be expressed in risk-averse policy principles. In the first empirical chapter, the range of policy principles suggested for (international) water management will be discussed. From this discussion, it will become apparent which trends in society are supported by these principles. From the role policy principles play in the policy arrangements for specific issues in water management, it can be inferred which trends, and which story lines about the way to deal with these trends in water management, are dominant in policy implementation. Any differences between policy principles formulated at higher levels of governance and their operationalisation may be a hint towards factors that inhibit the operationalisation of these principles. An example of such a factor is a trend in governance, such as efficiency of public organisations, which may conflict with policy principles for integrated water management. This conflict could be referred to as the need for holism versus the limiting of resources needed for such an approach.

The trend towards *internationalisation (of policy)* can be identified via a greater influence of international policy institutions on Dutch water policy and management. The developments towards an expanding and more influential European Union are obvious in this respect. The influence of this development on Dutch water management will show from the degree to which public organisations in Dutch water management have to adopt, translate and abide by regulations from this European Union. Besides, it may show from developments in the organisation of water management and formulation of policy that indicate that water management is being addressed at the international level or according to specific

organisational principles, tools and instruments introduced or stimulated by the European Union or other international organisations. The difference in impact the trend towards internationalisation may have on different aspects of water management was already discussed shortly earlier on. Generally speaking, an increasing influence of international policy making on water management in nation states will lead to standardisation of policy in these nation states. This standardisation may enhance reliability and transparency of public policy and management. An interesting question to be answered in this respect, however, is whether or not this trend leaves sufficient room for tailor made approaches.

As was indicated above, the trend towards *scientification* can be identified from the formulation of elements of policy in quantitative terms. *Economisation* is a specific version of this trend, which can be interpreted as expressing policy in economic terms and figures and applying economic approaches to policy issues. This trend may therefore be an important stimulus for the application of economic policy instruments and evaluation methods. This trend can be identified from the formulation of elements of policy, such as principles, goals, instruments and methods in economic terms. Examples of economic policy principles are 'full cost recovery', 'efficiency' and 'cost effectiveness'. The trends towards scientification and economisation may be used as an argument to call for economic instruments and methods in general and exact (that is to say, 'complete' policy instruments based on the neo-classical tradition) in particular. One likely argument for scientification of policy is the security provided by the reduction of risks through this approach and the improvement of the control over exogenous factors. This argument is heavily disputed, since opponents argue that scientification and economisation of policy generate a false sense of security because of the bounded rationality of human beings and the unpredictability of nature and society. Scientification and especially economisation may be (consciously or unconsciously) interpreted as goals in itself, which may cause a misbalance between the focus on means and focus on reaching primary policy goals. The way these trends are translated into concrete elements of policy is likely to determine their contribution to integrated water management. With regard to this translation (and thus interpretation), it may be expected that, similar to the discourse about efficiency, two opposing camps will exist: those that interpret economisation as an argument to get some economic sense in public governance or to make a shift from public allocation of resources to private (market) allocation, and those that interpret economisation as an argument to get some ecological sense in markets via economic policy instruments. The latter interpretation is largely in line with the trend of ecological modernisation.

A specific type of scientification is the development towards '*technologicalisation*' of *information and communication*. This trend leads to ever-faster generation and sharing of information. One of the consequences of this trend for water management may be that non-primary actors may have access to information previously reserved for primary actors and that the divides between specific categories of actors (such as politicians, public administrators and scientists) in terms of their access to specific types of information are fading. In economic terms, the asymmetrical distribution of information is being evened. For water management, this may mean that previously secondary actors demand to be involved in water management and use the availability of information as a resource to back up that demand. This in turn may lead to a changed and broadened composition of actors involved in policy arrangements. The impact of this trend on water management can be identified by

investigating the origins of the (argumentative) resources used by various actors in the power struggle and the struggle for discursive hegemony.

The trend towards *ecological modernisation* can be identified from elements of the policymaking process that refer to the incorporation of ecological or environmental aspects in other policy domains, scientific disciplines and/or societal activities. An examples of the first are policy principles that aim to incorporate environmental costs and benefits in economic analysis and economic activities, such as the 'polluter pays principle', the principle of 'rectifying environmental damage at source' and 'the full cost recovery principle, *including environmental and resource cost*' (see EU policy in the next chapter). Other examples are the greening of the tax system and the incorporation of environmental values (both costs of damage to the environment and benefits of (healthy) ecosystems) in cost-benefit analyses of policy alternatives and national accounts. The influence of this trend on water management can be identified by analysing the elements of policy as discussed in chapter 2 (see figure 2.2) and their operationalisation.

Finally, the trend towards *emergence of post-material values* is similar in nature to the trend towards ecological modernisation. This trend can be identified from the incorporation of non-material values in policy evaluation and the expression of these values by actors involved in the policymaking process. The incorporation of non-material values in policy evaluation can basically be performed in two ways. The first is by expressing these non-material values in terms that fit in vested (modernist) evaluation methods. This approach is chosen when trying to value the goods and services of aquatic ecosystems in monetary terms and include these values in economic evaluations. The second way is by designing methods for policy evaluation that express these non-material values in other than modernist units, or that do not express these values in a quantitative way. Actors adhering different paradigms regarding the man-nature relationship will have different opinions about which approach is preferable. The range of values of water and water systems and the degree to which these values can be incorporated in economic analysis was discussed earlier this chapter. Examples of non-material values of water and water systems are their spiritual value, their aesthetic value, their existence value and (part of) the bequest value⁸⁵.

Identifying shock events and their influence

In contrast with trends, shock events have a short time span. However, trends and shock events may very well be closely related, since shock events are often the consequence of long-term trends in society or nature. Examples of shock events caused by a trend in nature are flooding and droughts due to climate change. Examples of shock events caused by trends in society are 'terrorist attacks' due to radicalisation of certain groups in society. Shock events are thus often very explicit manifestations of more gradual trends in society. As such, they have an important indicator function for trends. Trends in society may remain unnoticed for a long time or remain absent from the societal and political agenda as long as no shock events result from them that focus attention on the trend. Society as a whole, and policymakers in particular may react in different ways to shock events. The main distinction with regard to the type of reaction is that between the mitigation of the symptoms of shock

⁸⁵ For a more extensive discussion of the values of water and aquatic ecosystems, see for example Lengkeek (2000) (in Dutch).

events and a structural reaction to the trend underlying it. The analysis of the reaction in water management to the near floods in the 1990s and the droughts in the early 2000s will show that both types of approaches may be combined as well. With regard to themes and patterns related to shock events, it is expected that shock events may have a number of impacts on water policy. They may lead to a reinforcement of existing policy, a shift to new policy or a combination of both, depending on the power balance between different views. Generally speaking, they are expected to be a means to legitimise policymaking procedures that cut across or bypass existing institutions regarding this process. This will especially be the case if there is a high sense of urgency to react to the shock event. In water management, this may be the case for (near) floods, severe droughts or acute cases of water pollution. In situations in which a more long-term approach to the issue is chosen, the policymaking process is expected to take place more according to existing process institutions.

Identification of institutions and their influence on the 'field of power' in the policy arrangement

The next step is a description of the (formal and informal) institutions that enable or prevent the use of economic policy methods or instruments. As was mentioned before, institutions are an indication of the embeddedness and stability of the arrangement at hand. These institutions may be the result of the way society has dealt with the issue in the past, through either public policy or private initiatives, and may therefore be specific for the issue at hand, or they may consist of institutions that are general in nature and as such also apply to the policy issue at hand or the economic tool or instrument suggested. An interesting category of such general institutions is institutions resulting from long-term developments in society. As was argued above, comparing the relevant long-term developments identified with the institutions related to the issue and instrument at hand is expected to help explain to what extent the choice, role and content of economic policy instruments and methods is influenced by these long-term developments. Besides reflecting large scale, abstract developments such as long-term trends, institutions may also result from more small scale, pragmatic impulses, such as the practical operationalisation of policy, agreements at the inter-individual level or personal preferences of (influential) actors involved in an arrangement. The way these institutions will be identified and characterised will be described below.

With regard to *formal institutions* addressing economic approaches in policymaking, three types of institutions were identified in this chapter (see North, 1990): political, economic and contract-rules. *Political rules* (such as policy principles, goals, and instruments, including laws) are expected to determine to a large extent whether or not an issue will be addressed via a market-based approach. If so, they are also expected to determine in broad lines the role of public authorities in this economic approach (for example, through the choice of the type of economic steering instruments or evaluation method). The political rules consist of the elements of policy as identified in figure 2.2. Most of these elements can be regarded as formal institutions, but some, such as paradigms, can be regarded as informal institutions.

Institutions that do not belong to the category of 'elements of policy' as presented in figure 2.2 are not likely to be expressed explicitly in policy. Examples of such institutions are the property rights of the good(s) addressed. These institutions belong to the categories of

'economic rules' and 'contracts'. Therefore, these institutions will have to be identified in other ways than via the analysis of formal policy papers.

Property rights were divided earlier this chapter into ownership, disposition and use rights. The ease of identification of these rights will depend on how well the good is defined. For example, this identification may be easier for the commodity 'land' than for the commodity 'surface water'. Ownership, disposition and use rights may have been established directly by public law, by standards resulting from policy goals and by instruments based on these standards, such as permits and concessions, or by contracts based on private law. The regulation of ownership by public law is only likely to exist in case of public tasks of paramount importance for society. The type of law the property right is based on determines the data source for identifying this right. Laws are publicly available, and may thus be more easily available than contracts based on private law. The latter may have to be analysed by specifically asking actors involved in the contract about the terms of the contract. The accessibility of this information may depend on the issue at hand and the stakeholders involved. Public laws and standards based on policy goals, such as ambient environmental standards and emission standards, determine the property rights with regard to environmental resources and buffer capacity. Finally, market institutions are likely to originate either from laws addressing specific issues in water management (f.e. via economic instruments) or from general laws regulating economic transactions either in the domestic or EU-internal market. As will show from empirical analysis, these general market-related institutions issued by the EU can have a major impact on the feasibility of arrangements in Dutch water management. Many of these regulations in law will have to be elaborated into more detailed institutions. In case of the application of generic economic steering instruments for environmental policy, these institutions have to be specified in the law and can thus be identified via this law. In case of decentralised arrangements, laws will have to be translated for the specific situation of the arrangement at hand. As a consequence, formal institutions for decentralised arrangements are likely to originate from all three levels of formal institutions (political, economic and contract rules). Formal institutions regulating economic evaluations may originate from the level of political rules. For the rest, they are likely to be regulated by informal institutions regarding the way to perform such evaluations. These informal institutions may originate from the scientific, political, administrative or business-arena. Economic rules and contracts are not likely to be involved in economic evaluations.

Informal institutions are expected to be especially relevant for the *process* of policy formulation and implementation, more than (directly) for the content of it. They can consist of a historically grown approach to an issue, including rules regulating which actors play a central role, the role they are allowed to play and the paradigms that form the basis of the policy approach. Important informal institutions with regard to integrated water management are for example the role society expects government agencies to play with respect to an issue and historically grown informal 'rights' actors have appropriated to use, pollute and transform natural resources. Important informal institutions with respect to the use of economic policy instruments and evaluation methods are for example non-written contracts, such as (tacit or explicitly expressed) agreements or expectations about compensation for water damage. Informal institutions may crystallise into formal institutions or may give a specific (often disputed) interpretation to formal institutions. For example, a change in policy

may lead to a change in formal institutions. However, actors that feel negatively affected by that change may oppose to these formal institutions by referring to and abiding by the existing informal institutions. The result may be that changes in practices take place slowly or do not take place at all, while formal policy has changed. This phenomenon may be referred to as the theme of path dependency and/or incremental change. The analysis of the institutional framework is expected to yield information about the perceptions (opinions, preferences, interests and motives) of the primary actors in the policy arrangement with regard to the use of economic methods and instruments. The perceptions of secondary actors will not show from existing informal institutions and will therefore have to be obtained via other ways, such as the analysis of discourse. Informal institutions are not likely to be expressed in formal policy documents. Therefore, they will have to be identified by using other data sources. Since they will not always be explicitly expressed and named as such, these informal institutions may even have to be inferred from these data sources by means of argumentation.

Characterisation of resources, strategies and power relationships and their influence on the role and content of the economic instrument or method

Analysis of the (strategic) use of resources is expected to lead to insight into the power balance in the policy arrangement as a whole and the discourse about the issue in particular and into the way actors try to manipulate other actors in the struggle for discursive hegemony. The analysis of the combination of the power balance between the actors and the interests, motives and goals of these actors is expected to enable the explanation of why certain instruments or methods are or are not applied. Strategy was defined earlier as the way in which actors try to influence other actors via a plan conceived in advance and possibly the adaptation of that plan according to circumstances. This strategy may be to advocate or oppose to economic instruments and methods, or to influence their design and implementation. The strategy may even be to focus on a different (level of) discourse in order to lead the discourse away from the subject of instrument choice. It is therefore interesting to analyse on which type of discourse the various actor groups concentrate the strategic use of their resources. The power balance between actors can be identified by analysing the various actors involved in policymaking regarding an issue, the various story lines these actors hold and the dominant discourse resulting from the interactions between these actors. The dominant discourse is the result of the struggle for discursive hegemony and as such represents the balance between the story lines of the actors involved.

With regard to the strategies applied by the actors involved in discourse, two main types may be distinguished. The first is that secondary actors (or in case of the absence of a dominant discourse: all actors) present their own, unique story line and try to get support from other actors. The second is that secondary actors adapt the dominant discourse and try to present their own story line in order to get the maximum result in terms of their own interests. This can be regarded as modifying the dominant discourse 'from within'. Which strategy is best may depend on whether or not a dominant discourse exists, the degree of institutionalisation of the dominant discourse, the power balance between primary and secondary actors and the impact of impulses for change on the arrangement. An interesting characteristic of story lines in this respect is whether they focus on fundamental or pragmatic arguments. When trying to change discourses from within, the focus may be more on pragmatic arguments than in case of a struggle between diametrically opposed story lines.

Making one's story line into the dominant discourse is one of the strategies to obtain power over other actors (story lines used as resource), but not necessarily the only or most crucial one. Sometimes actors may be able to enforce or obstruct policy according to the dominant discourse because they hold a very powerful or crucial resource for this process. A dispersed distribution of resources and (thus) of power is likely to require a different strategy for governance than in case the crucial resources reside with the public initiator of policy. Therefore, the identification of the diffusion of (crucial) resources is an important part of this step. Existing institutions are a special and important type of resource, since they have been legitimised (to varying degrees) by some sort of process of legitimisation in society. Since changing institutions requires the expense of a certain amount of resources, they are not always easily changed, and therefore, they may form a convenient type of protection for the primary actors of the current arrangement. Instead of focusing their resources on discourse, actors may therefore also focus their resources on changing or maintaining existing institutions.

Information is another type of resource that may play an important role in the formation of policy arrangements. The distribution of information among the actors involved, the type of information, the way these actors use this information and the degree to which they share it are important characteristics in this respect. Each type of policy instrument or method (and thus each type of governance arrangement) requires specific information. It is expected that the debate about economic evaluation methods is a highly specialised debate, largely taking place in the scientific arena. This debate may be largely hidden for actor groups such as citizens and business. Besides, government agencies may depend on knowledge institutes to provide this information and the knowledge institutes may be attributed 'knowledge authority' in order to legitimise their advice. Therefore, these institutes, and the scientific story lines they tell about the evaluation method may have a large influence on the outcome of the method and (thus) the arrangement. With regard to neo-classical arrangements, both government agencies and target groups hold information that would be required to design a well functioning arrangement. However, these actor groups are expected not to be very willing to share this information, because it can give either one a strategic advantage relative to the other. In decentralised, new institutional arrangement, public and private actors also hold information that is required to design a well functioning arrangement. However, as a consequence of the interdependence of the actors, the positive incentives of the arrangement and the voluntary basis of the interaction, it is expected that this information will be more easily shared, and will not be used (as much) as a strategic resource. As shows from the discussion above, the distribution of resources, the availability of information, the importance of scientific information and the degree to which various actors use these resources strategically may for a large part decide what style of governance is chosen with regard to the issue at hand.

With regard to strategy, a number of important characteristics can be identified as well. Characteristics already identified are the strategic use of resources, either direct at a specific type of discourse or at existing or new institutions and the style of governance chosen by public authorities in the light of the pattern of distribution of resources. This style of governance will to a large extent determine the degree of freedom granted to target groups of policy and may as such determine the attitude of these actors. An important aspect of

strategy is the formation of actor coalitions. Important characteristics of these coalitions are whether they are new or old, the number of coalitions involved, the degree to which actors within one coalition are organised, the degree to which the interests (ideologies, goals) of actors involved in a coalition coincide and the degree to which coalitions are opposed to each other.

The strategic use of resources will give actors involved a specific power position in the arrangement. Important characteristics of these power positions are whether power is concentrated within one actor or dispersed among actors, whether power positions are obtained from institutions or via discourse and whether actors hold crucial resources. The combined analysis of the motives of stakeholders (as described earlier) and the power position they hold in the arrangement is expected to yield good indicators of the way the dominant discourse regarding the role and content of economic methods and instruments has emerged and how this discourse was/is being anchored in institutions. Important characteristics of the resulting arrangement are whether or not this arrangement is a type of arrangement that has been used before, whether it is centralised or decentralised, whether it primarily contributes to the primary goal of integrated water management or to other, secondary goals of water management or governance in general and which actors are (dis-)served by the arrangement and how.

Characterisation of the role of the economic instrument or method involved

The steps described above are considered crucial and sufficient in forming a comprehensive reconstruction of the policymaking process regarding issues in Dutch water management and their institutionalisation into governance arrangements involving economic policy instruments and evaluation methods. The role of the economic instrument or method in each arrangement discussed can be characterised by analysing its formal purpose, any informal purposes, the way it was designed to serve these purposes and the (perceived) effects it has on the policy goal(s) and any (intended or unintended) side-effects. These dimensions constituting the role of the instrument are expected to determine the degree to which various actors involved in the issue at hand accept the instrument. More generally speaking, the role of each category of economic instrument or method involved in Dutch water management can be characterised by describing the scope of its application, the way it is designed, the role it is attributed in various governance arrangements and the effects it causes as a consequence. Each of these aspects is considered important for answering the question to what extent these instruments contribute to integrated water management. This question will be addressed at the end of this thesis, since answering this question requires the total body of empirical data and its comparison with the theoretical insights as discussed in this chapter.

3.7.6 METHODS FOR EMPIRICAL ANALYSIS

This subsection describes the methods for empirical analysis. In this subsection, a distinction is made between methods for the general empirical chapter (chapter 4) and the case-chapters (chapters 5 and 6). The reason for this is that the methods used in these chapters are partly different.

METHODS FOR THE GENERAL EMPIRICAL CHAPTER

As was indicated before, the purpose of the general empirical chapter (chapter 4) is to analyse Dutch water policy with regard to the intention to use economic policy instruments and evaluation methods. Besides, chapter 4 aims to present an overview of elements of policy and (other) elements of the analytical framework that are general in nature, and may as such apply to both water quantity management (chapter 5) and water quality management (chapter 6). Chapter 4 acts as a framework of reference to put the cases of chapters 5 and 6 in perspective. The main method for data gathering in the general chapter is document analysis. These documents may originate from various arenas (political, societal and scientific) and may have varying status in policymaking in water management. Examples of (presumed) influential documents are white papers at various policy levels and publications from influential research institutes and research commissions. Influential research institutes are generally those institutes that are appointed scientific authority by the dominant actors in a policy arrangement (the vested interests). However, publications from institutions holding less authority may also be of influence on the way of thinking about a policy domain or issue and the role of public authorities in these domains or issues. The influence of research commissions on policymaking is likely to depend on the position of the issue on the political agenda. Firstly, the fact itself that a research commission has been installed indicates that the issue addressed has a sufficiently high position on the agenda to legitimise such a commission. Secondly, the policy domain by which the issue is addressed needs to have a high position on the political agenda as well. This position can be determined by various impulses for change, but a societal or natural shock event is likely to be a strong impulse. Examples of such an impulse in the domain of water management are the near floods in the 1990s and the droughts in the early 2000s. However, since 2001, this attention for water management has been somewhat overshadowed by the attention for terrorism. Thirdly, the impact of a commission's advice will depend on the composition of the commission and probably on the concordance of the result with the belief systems of the dominant actors in water policy and management. The choice of documents to be analysed was based on personal judgment and feedback from colleagues and experts. It must be noted here that documents (and thus policy) considered influential need not specifically address water management. An example of such documents is general guidelines regarding competition in the EU-internal market. In chapter 4, it will be specified and legitimised in more detail which documents and which specific elements in these documents were analysed.

METHODS FOR THE CASE-SPECIFIC EMPIRICAL CHAPTERS

In the case studies of chapters 5 and 6 policy issues will be analysed by describing general characteristics of the policy issue (for example the scale of its effects, the scale at which it is addressed, the 'age' of the issue), the elements of the policy arrangement, specific impulses for change that influence the arrangement (both exogenous and endogenous to the policy arrangement), the stages of policymaking the issue has gone through, the motives and positions of individual actors, the decisions taken in this process and the resulting elements of policy as described in figure 2.6, including the role of economic evaluation methods and policy instruments addressing the issue.

The methods for empirical analysis of these cases are qualitative in nature. The units of analysis are the elements of the analytical framework and the relationships between these elements as discussed in this chapter and summarised in table 3.5. Logically, the overall method to be applied in chapters 5 and 6 is case study analysis. Yin (1994: 13) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context. This method is considered especially useful in situations in which the boundaries between a phenomenon and its context are not evident. So case studies explicitly include the context of the phenomenon being studied, which makes it a very suitable method for this thesis. Case studies rely on multiple sources of data, including interviews and document analysis, and benefit from the prior development of theoretical propositions to guide data collection and analysis (Yin, 1994: 13). It is a comprehensive research strategy that allows for an integrated analysis and explanation of the complex factors in the context of policymaking processes, influencing the role of economic policy tools and instruments in Dutch water policy and management. The case study analysis in the chapters 5 and 6 will be performed to pursue a combination of the following goals:

- *Explore* the policymaking process and its context regarding specific policy issues in Dutch water management involving economic evaluation methods and policy instruments;
- *Explain* the outcome of these policymaking processes with regard to the role and content of economic methods and instruments by analysing the relationships between elements of (factors in) this process and its context.

Data gathering and analysis for both goals is guided by the analytical framework as developed in this and the previous chapter combined with theory about (economic) policy tools and instruments as presented in this chapter. The methods for data gathering for these chapters are (a combination of) interviews, participatory observation and document analysis. The document analysis focuses on the analysis of various types of documents, such as political and administrative documents, newspaper articles, internet-sites and formal studies of various organisations addressing the issue at hand. The aim of this method of data-collection is to obtain information on all elements of the analytical framework, but the focus will be specifically on elements of policy acting as formal and informal institutions. The document analysis is regarded as a method to make an analysis of more objectified elements of the framework related to the issue at hand. The interviews focus more specifically on the stakeholders involved in the policymaking process, their interests in the (outcome of the) process, their opinion regarding various types of discourse, their motives, their view on the issue and the role of economic policy tools and instruments in addressing this issue through public policy (the discourse), the resources these actors use and the power-relationships they have with other stakeholders. The interviews are therefore regarded as a method to make an analysis of more subjective elements of the framework. That is to say, through interviews, an analysis is made of the perspective of actors on the issue and the policy arrangement addressing that issue. Both methods can be used to identify the reference to trends in society as part of story lines in discourse.

The interviews are structured as semi-standardised interviews. In semi-standardised interviews, open-ended questions on facts of matter and opinions or insights are combined with theory-driven questions based on theoretical propositions (Flick, 1998: 84). Such interviews are suitable in situations where the interviewee has a complex stock of knowledge

at his disposal about the topic, including both assumptions that can be answered spontaneously in open-ended questions as well as implicit assumptions, which may be articulated through the more theory-driven questions (Flick, 1998: 82). Because of this combination of two types of questions, this interview technique is considered very suitable for this thesis. The exploratory research questions of this thesis will be addressed through open-ended questions, while the explanatory questions will be addressed through the theory-driven questions. Expected stakeholders of water policy issues to be interviewed are various public water authorities (both political and administrative) involved in formulating and implementing policy, expert institutions performing studies with regard to the feasibility of economic policy tools and instruments, permanent or temporary advisory organs and committees that advise the political and administrative arenas with regard to specific policy concepts and approaches (possibly) including the application of economic policy tools and instruments, and target groups of policy and their representative organisations. The way specific elements of the analytical framework will be analysed by means of these methods will be described in more detail in subsection 3.7.6.

3.8 SUMMARY

In this chapter, a framework was created for empirical analysis of the decision-making process regarding the content and role of economic policy instruments and evaluation methods in Dutch water management. This framework was created by combining insights in integrated water management, the economic analysis of societal phenomena and theory about economic policy instruments with methods of and theory about policymaking. When looking at the theoretical characteristics of economic environmental policy instruments, they appear to be superior in a number of respects to traditional command and control instruments, especially with regard to efficiency of public policy and the fact that they provide a dynamic incentive to innovate towards more environmentally friendly production and consumption patterns. Besides, they are attributed a higher degree of flexibility for target groups to choose the best strategy for pollution abatement or reduction of natural resource use. Based on the theoretical discussion of their characteristics, it is expected that neo-classical market-based instruments for environmental policy and methods for nature valuation contribute to the valuing and thus the weight of the environment (aquatic ecosystems) in economic decision-making processes, both with regard to decisions by economic actors in markets and to decisions by public authorities in public projects and policy programmes related to water management. As such, these instruments and methods are expected to contribute to integrated water management. However, we have also seen that a considerable number of conditions have to be fulfilled for markets and market based neo-classical policy instruments to function properly. These (categories of) conditions are summarised in Annex I. They consist of criteria for economic analysis of societal phenomena, criteria for perfect competition and criteria for well-defined property rights. Besides, this Annex included supposed advantages and disadvantages of economic policy instruments.

As was mentioned above, efficiency is one of the major merits ascribed to economic steering instruments. Based on the discussion of the key characteristics of integrated water management, however, it can be concluded that efficient use of public and private resources cannot be regarded as a primary goal of integrated water management. In contrast, efficient

use of water and the goods and services of aquatic ecosystems can. Efficient use of public and private resources may be a derived, general policy goal. It was argued in this chapter that the argument of efficiency is likely to be used for serving diverging, maybe even opposite interests in water management, namely on the one hand those of private economic actors that use efficient allocation via the market mechanism as an argument for reducing the public budget for water management and thus the tax burden and for personal economic gain, and on the other those of public and private actors that use efficiency as an argument to reduce the pressure from society on water and aquatic ecosystems. The first argument for efficiency addresses the use of public financial resources, while the second addresses efficient use of water and the natural resources provided by aquatic ecosystems. This expected diverging use of the 'efficiency'-aspect of policy is one of the possible themes that may (help) explain the choice of economic policy instruments and evaluation methods in Dutch water management.

Whereas neo-classical economic instruments for environmental policy may be useful in water quality management and in water quantity management with regard to curbing the use of water, they are not likely to be useful for dealing with excess water. In this situation, not water itself is relatively scarce, but rather the commodities threatened by excess water, such as cultivated land, buildings and infrastructure, and even human beings and other living creatures. Besides, water has an added value for other land use functions in a visual sense, which makes water a scarce commodity in this respect. By taking these types of scarcity as a starting point, measures in water management addressing excess water may be based on economic principles as well. It was argued that centralistic neo-classical economic steering instruments are not likely to make a useful contribution under these circumstances. From a theoretical point of view, for this aspect of water quantity management, arrangements involving (incomplete) contracts are more likely. Therefore, the theoretical background of these incomplete contracts and their possible application in water management was addressed in this chapter as well. Besides being theoretically more suitable for dealing with excess water, this type of instrument may also be considered for dealing with water shortage (especially by enhancing reserves) and the management of aquatic ecosystems, in situations in which the property rights of the commodities at stake are not sufficiently defined to enable complete contracts. With regard to these latter aspects of water management, it is not obvious on forehand which type of instrument is better suited. The difference with economic instruments for environmental policy as discussed in this thesis (providing a negative incentive to target groups) is that these instruments aim to regulate supply of water or ecosystem services instead of demand for these commodities.

Since economic co-ordination mechanisms aim at allocating scarce resources to those activities for which demand (and thus, ideally, utility) is highest, an economic approach to allocating financial resources in water management and to allocating water itself (which in most cases is a scarce resource) theoretically leads to efficient allocation. Besides, neo-classical economic theory states that expressing the value of water and aquatic ecosystems in monetary terms (either or not via a price in a market) will lead to efficient water use. However, this does not automatically mean that economic approaches also contribute to integrated water management. Preconditions with regard to the contribution of economic policy approaches to the aim of integrated water management, as identified in this chapter are that all effects of and interests related to economic activities are included in decision-

making processes about these activities, that all goods and services that have value are included and that these goods and services are valued at their true (economic⁸⁶) value. As we will see in the remainder of this thesis, some developments are made in the direction of meeting these preconditions. However, these developments are confronted with substantial and, according to some, insurmountable obstacles.

A description of the policymaking process and the selection criteria for (environmental) policy instruments showed that the characteristics of economic instruments that, according to their advocates, make them theoretically superior to regulative instruments⁸⁷ may not be decisive in the choice of instruments for environmental policy. Besides these characteristics, a range of other arguments may play an important role in policymaking processes in water management. Moreover, opinions about the score of instruments on each of the criteria considered, including the ones for which economic instruments are supposed to be superior, may diverge as well, depending on specific perception of actors involved. In chapters 2 and 3 it was argued that the criteria that are decisive for the choice for policy instruments depend on the context in which this choice is taken. Besides, elements in this context may act as selection criteria themselves. Because of the importance of the context on choices in policymaking, an analytical framework was constructed that will help describe this context and the role various elements in this context may play in the choice of policy instruments in the practice of Dutch water management. The core of this framework consists of the middle range concept of policy arrangements as presented by Van Tatenhove et al. (2000). This concept combines the analysis of the structure of the context of policymaking with the substance of policymaking. However, it was argued in this chapter that this approach does not explicitly address the level of analysis of individual actors and their beliefs, interests and motives. As a consequence, the role actors play in policymaking can be identified but cannot be explained. Therefore, this level of analysis was included in the framework and made operational for empirical analysis. Another level of analysis considered important in this thesis is that of impulses for change that influence the shape and outcome of decision-making processes in Dutch water management. Van Tatenhove et al. (*idem*) do address this level of analysis, from the perspective of political modernisation. However, this perspective was considered too narrow to cover the range of possible impulses for change that may influence the choices in policymaking in the domain of water management. Therefore, this level of analysis was expanded to include a number of other impulses for change, such as trends in society and nature and shock events as sudden manifestations of these trends. Besides expanding the analytical framework, the specific elements of this framework and the relationships between these elements were specified for the subject of this thesis. At the end of this chapter, it was described which characteristics of each of these elements are considered important for the characterisation of the policy arrangement and the identification of factors in the context of policymaking that explain the choice of policy instruments and evaluation methods in Dutch water management. It is the purpose of this thesis to describe

⁸⁶ Whether goods and services should be valued at their total value or total economic value depends on the role assigned in decision-making to economic instruments and methods.

⁸⁷ In most literature, the comparison of policy instruments involves economic instruments and regulative instruments. Suasive instruments are often left out of analysis. For the sake of clarity, these instruments are not addressed in this thesis. However, it should not be concluded from this decision that I regard this type of instruments of no use for attaining the goals of integrated water management.

the role of various elements of the analytical framework play in this respect in terms of themes and patterns, in order to be able to generalise the findings of empirical analysis. Therefore, it was described in this chapter in which way various elements of the analytical framework are expected to influence the choice of policy instruments, through which mechanisms they are expected to do this and how these elements and mechanisms can be identified in empirical analysis. A number of possible themes and patterns were already identified in this chapter. In the empirical part of this thesis, these themes and patterns will be tested and others may be identified. For this purpose, the reality of Dutch water management will be described in a structured way, according to the analytical framework as developed in this and the previous chapter.

CHAPTER 4 IMPULSES FOR CHANGE AND THE INCORPORATION OF ECONOMIC APPROACHES IN DUTCH WATER MANAGEMENT

4.1 INTRODUCTION

The purpose of this chapter is to present and analyse elements in the process and context of policymaking in Dutch water management that can help explain the choices being made in specific arrangements. The elements discussed in this chapter are general in nature, in the sense that they do not specifically address one policy issue. Instead, they may, in principle, address various aspects of Dutch water management, such as water systems quantity and quality management, ground water and surface water management, excess, shortage and safety aspects of water management, and various policy issues within and between these aspects. Both the analytical levels of 'exogenous factors' and 'policy arrangements' contain such 'general elements', although the first is (per definition) more generic in nature than the latter. Exceptions to this rule may occur. For example, some exogenous factors may only be relevant for a limited number of water management issues (such as climate change, which is mainly relevant for water quantity management), while some (elements of) dimensions of policy arrangements may be generally applicable, such as, for example, institutions that address all aspects of water management⁸⁸ and discourses about concepts that apply to water management in general (such as integrated water management). As was argued before, exogenous factors (such as trends in society, governance and nature) lead to both general and specific elements of policy (institutions) via discourse. In this chapter, with regard to the analytical level of policy arrangements, mainly the dimension of 'institutions' will be addressed.

With regard to the elements of policy as identified in figure 2.2, it can be argued that some are more generally valid than others. Roughly speaking, going from the top of the figure to the bottom, the elements become more specific and (thus) less generally valid. Policy paradigms and principles usually apply to several policy issues at the same time (although to varying degree), while policy goals and concepts, instruments and methods are targeted at

⁸⁸ Examples of such institutions are EU-regulations regarding competition in the EU internal market and national laws regulating the organisation and financing structure of Dutch water management.

specific aspects of or issues in water management. In the empirical chapters, a distinction is made between generally applicable elements of policymaking and issue specific elements of policymaking. The (more) generally applicable elements will be discussed in this chapter, while the issue specific elements will be addressed in chapters 5 and 6. As shows from this introduction, the level of analysis of individual actors is not discussed in this chapter. The reason for this is that the empirical material discussed in this chapter contains (mainly) official policy documents. These documents are formal policy, which is the outcome of policymaking processes, and as such represent the dominant discourse. As such, they are an 'inter-individual' aspect of policymaking, from which the characteristics of individual actors cannot be distilled. A consequence of the choice to discuss only formal policy in this chapter is that the process of formulating this formal policy will not be reconstructed in terms of the analytical framework. In other words, the 'general elements' as discussed in this chapter are taken as given facts for the reconstruction and analysis of governance arrangements in chapters 5 and 6. In this chapter, an attempt is made to explain the specific appearance of general (economic) elements of policy by the balance between the trends as will be discussed first. In turn, in chapters 5 and 6, the specific appearance of economic policy instruments and evaluation methods in the arrangements discussed will be explained by combining the influence of the general elements as discussed in this chapter and the issue-specific elements of the analytical framework as discussed in those chapters.

The structure of this chapter is as follows: section 4.2 discusses trends in society, nature and governance that are considered relevant for the role and content of economic policy instruments and evaluation methods in Dutch water management. Section 4.3 will first discuss general elements of EU water policy (category (c) in figure 2.6), being policy principles and general policy goals. The policy principles are strongly related to the paradigms on the man-nature relationship as discussed in chapter 3. General policy goals are a first step in the operationalisation of these abstract elements of policy, not yet related to specific issues. Secondly, section 4.3 will provide an overview of the position of economic evaluation methods and policy instruments in policy resolutions at EU-level. Moreover, an overview is provided of economic policy approaches already in place in Dutch water management and in other EU- and EU-candidate countries. This overview serves to demonstrate the position and intentions of Dutch water policy with regard to integrated water management and the role economic policy instruments and evaluation methods are to play in it, compared to other countries (which was identified as another point of reference for the degree of their application in Dutch water management). Section 4.4 focuses more specifically on economic elements in Dutch water policy. This section will address various levels of policymaking in Dutch water management, varying from the national-level to the level of water boards. The degree to which economic steering instruments and evaluation methods are suggested in policy resolutions was identified as one of the points of reference for the degree these instruments and methods have actually been implemented.

In section 4.5, the position of economic policy instruments and evaluation methods in Dutch policy and management will be confronted with the theoretical scope and role as derived from chapter 3. Any discrepancies between the expected and actual scope and role resulting from this confrontation will be addressed in chapters 5 and 6 by analysing the policymaking process with regard to specific issues in terms of governance arrangements. This section will end with a summary of the chapter, by giving an overview of the main 'general elements'

identified in this chapter that are considered to play a role in the choice and content of economic policy tools and instruments in Dutch water management. These elements will act as a 'framework of reference' for the discussion of specific policy issues and arrangements in Dutch water management in chapters 5 and 6. The framework of reference is expected to be helpful in explaining some of the findings in those chapters. They will help understand the specific manifestations of dimensions of the policy arrangement and their interactions by explaining the influence of the factors identified in this chapter on these dimensions and their interactions.

4.2 TRENDS IN SOCIETY, NATURE AND GOVERNANCE

In chapter 3, I discussed a number of impulses that can lead to a change in policy arrangements. Some of these impulses act at the level of society as a whole (exogenous factors), some may emerge from within policy domains or arrangements (endogenous factors). As was mentioned in the introduction, the impulses emerging from within policy domains and arrangements may have been caused by impulses acting at the level of society. An example is that actors involved in a policy arrangement argue that the set of institutions applying to that arrangement has become too large, and that changes need to be made to relieve the burden of this set of institutions. The opinion that this set of institutions has become too large may have been influenced by the general trend in governance of deregulation. With regard to the impulses acting at the societal level, a distinction was made between trends and shock events. Shock events have a strong, but often temporary impact on society. Often, but not necessarily, these shock events are manifestations of underlying trends. For some of the relationships between shock events and long-term trends in society and nature, there may be consensus, while for others this consensus has not yet been reached in the scientific arena, let alone the political and societal arenas. This degree of consensus is very likely to influence the policy approach to these phenomena. The impact of shock events and long-term trends on governance will depend on the period these trends and shock events remain on the political agenda and the priority they are given and on the degree to which this attention is converted into institutions. The latter will depend on the existence of a dominant discourse about the way to deal with these phenomena.

In chapter 3, a number of impulses for change were identified that may influence the choice for and role of economic policy instruments and evaluation methods in Dutch water management. The impulses for change that were indicated as trends can be grouped into three categories: (a) trends in society, (b) trends in governance, and (c) trends in nature. Category (a) can in turn be divided into a number of subcategories:

- Trends in the scale of living;
- Trends in society itself, and;
- Trends in the man-nature relationship.

The sub-category of 'trends in scale of living' is also applicable to category (b) trends in governance. In this situation, this category of trends can be referred to as 'trends in the scale of governance'. The same can be said about the trend in the man-nature relationship. The categorisation above is somewhat arbitrary, as will show from the discussion of the trends below. Various trends fit in more than one category, while some trends influence other trends or influence each other. Trends in society may cause, reinforce or reduce trends

in nature (such as for example increased emissions leading to the greenhouse-effect, leading to climate change) and in governance (public governance reacting to trends in society). Besides, changes in thinking about the way trends in society and nature should be addressed can result in trends in governance, which may in turn change the influence of governance on society and nature. This section will discuss the trends, as identified in chapter 3 and categorised above, with regard to their (potential) impact on the use of economic instruments and methods in Dutch water management. Since in this thesis, the influence of trends in society and in nature on governance is considered more important than the other way around, trends in society and nature will be discussed first. Moreover, the discussion of trends in nature will also discuss a number of shock events considered to have (had) an important impact on water management.

4.2.1 TRENDS IN SOCIETY

GLOBALISATION AND INDIVIDUALISATION OF SOCIETY

The trends of globalisation and individualisation can be shared in the category of 'trends in the scale of living and policy'. In the discussion of political modernisation in chapter 3, a number of stages of development were distinguished regarding the relationship between society, the state and the market. These stages were referred to as early, anti and late political modernisation. According to Van Tatenhove et al. (2000: 37), early political modernisation is closely linked to the project of modernity, which was defined by Giddens as 'a cluster of cultural and structural processes, of typical institutional forms, which came into being on the crossroads of capitalism, industrialism and the nation state (Giddens, 1990). Central elements of this stage of political modernisation are the progress of control, over both society and nature. According to Van Tatenhove et al. (2000:38), these notions come together in the notion of the 'manageable society'. This notion refers to the idea of man's ability to shape both the social and the physical world. The control and exploitation of the physical environment are demonstrated in the increasing depletion of natural resources and in the dumping of waste into the natural environment, resulting in a deterioration of the 'sustenance base' of society (Schnaiberg, 1980). Generally speaking, one could say that in the era of early political modernisation, there was a strong emphasis on material production and consumption patterns. Anti- and late-political modernisation can be seen as alternatives to this early modernisation. Whereas anti-political modernisation was a radical reaction to modernity in the 1970's, according to Van Tatenhove et al. (2000: 43), the prefix 'late' refers to the general idea that the 'manageable society' is not altogether rejected, but instead is being redefined, mainly as a consequence of two basic processes of change, namely globalisation and individualisation. Globalisation and individualisation, they say, are two major changes within the political, economic and socio-cultural domains. In general, globalisation implies that many political, economic and social activities are becoming world wide in scope. At the same time, it suggests that there has been an intensification of levels of interaction and interconnectedness within and between states and societies (Held, 1995: 21). According to Robertson (1992), because of globalisation, policymaking and governance will be greatly influenced, no matter whether homogeneous or heterogeneous tendencies of globalisation are accentuated. The first tendency refers to developments in standardisation, unification and 'universalisation' of social, economic, political and cultural patterns on a

global scale, the latter emphasises the diversity of reactions to these tendencies towards homogeneity.

In water management, the trend of globalisation is likely to be expressed in two major ways. The first way is that water policy will be formulated increasingly on an international level. For Dutch water management, the EU-level can be regarded as especially relevant in this respect. Since water management is not a global issue (at least not in the sense that a water related activity anywhere on earth can have an effect anywhere else on earth), global water policy with concrete targets is not to be expected. However, international organisations may formulate common (or even global) water management principles. The second way is that information from all over the world can be shared for addressing issues in water management. With regard to the use of economic policy instruments and evaluation methods, this means that examples from other countries or continents can be used as reference material. Other actors than water managers themselves, such as citizens and companies, can also use this sharing of information. As such, politicians and public administrators may no longer have a monopoly on information in this respect. This may force them to at least take account of and perhaps even involve other actors in the policymaking process. Both manifestations of globalisation are likely to lead to a standardisation of water policy on a global scale, although local situations and reactions will always diverge.

Individualisation is the second major change, making late (or 'post-' or 'reflexive') modernity the era of the individual, linked to the (globalised) world through new modes of communication, such as mobile phones and the internet. Many authors describe individualisation as an all-pervasive process, enabled by modern technologies and opening new perspectives for emancipation. At the same time, though, individualisation leaves the individual unprotected, whereas previously, it was protected by either the pre-modern 'mechanic solidarity' of family, kinship, neighbourhood, local community and church or the modern 'organic solidarity' of welfare institutions of the provident state. The former were eroded during the early modernisation stages, whereas the latter have been deregulated or privatised during the wave of 'less state' politics that has dominated Western countries over the last two decades or so (Van Tatenhove et al. 2000: 43). As was argued above, the new modes of communication may lead to better informed (non-governmental) actors, which has to be reacted to in the policymaking process. At the same time, the process of individualisation may lead to a situation in which certain groups of actors (such as citizens) become less well represented by joint organisations. Besides, in times of expanding possibilities, the interests of such groups may also become more dispersed. Both processes (better informed actors, and less well represented, more dispersed interests) may have to be anticipated to in water policy and management, in the sense of new styles of governance, new types of arrangements and new ways of involving actors.

RATIONALISATION AND ECONOMISATION

This trend can be shared in the categories of 'trends in society itself' and 'trends in the man-nature relationship', if specifically related to addressing environmental issues (in the broad sense). Rationalisation is a very broad process taking place in western societies. Van Doorn (1989) states there is a tendency towards such a process of rationalisation of society. While cultural, moral, political and ideological values and goals disappear to the background,

organisational, bureaucratic, technocratic and formalistic orientations become more pronounced (Van Doorn, 1989: 139). Van Doorn explains there are different meanings to the concept of rationality. In the first place, rationality can be related to a reasonable creature, with cerebral and sedate actions. Rational action shows self-constraint and civilised appearance. Secondly, Van Doorn distinguishes rationality in which behaviour is calculative, disciplined and pacified. A third definition, often adhered to by supporters of the Enlightenment, is the belief that the world must be perceived as a rational construction. This relates to a strong belief in the superiority of science, which embodies rational thought of reality, known as 'scientism'. A fourth explanation of rationality is that rational action is selective and purposive. The rational human being knows his interests and pursues these interests, is perfectly informed about the possibilities and means, which he consciously applies in order to attain his selected goals. This definition is supported by utilitarianism, which lies at the basis of neo-classical economics. Therefore, economisation can be interpreted as the neo-classical economic version of rationalisation. According to Ritzer (1996), rationalisation is characterised by an emphasis on four dimensions:

- Efficiency: the optimum method for getting from one point to another;
- Calculability: an emphasis on quantitative aspects;
- Predictability: the assurance that products and services are the same everywhere (standardisation);
- Control: especially through a substitution of human technologies (technologies controlled by humans) by non-human technologies (technologies controlling humans).

As we will see later in this chapter and the next two chapters, these dimensions can also be identified in Dutch water policy and management. A strong emphasis is laid especially on efficiency of (the use of public budget for) water management. On the other hand, a counter-trend can be identified towards management systems that are less dependent on the calculation of effects and the control of systems. This counter-trend can be regarded as a post-modern approach in water management. As such, it is in line with the trend of the emergence of post-material values as addressed below. However, there is a gliding scale between these approaches and therefore, elements of both approaches may be combined in water management. This is for example the case with the eco-pragmatic approach as advocated by Saeijs. This approach takes the dynamics and flexibility of ecosystems as a starting point and bases interventions in these systems on empirical data regarding the functioning of these systems and reactions to such interventions. So whereas the ecosystems approach can be regarded as a post-modern approach, basing interventions in these systems on models, calculations and data shows the influence of calculability (and thus rationalisation). These opposite trends and the discourse resulting from it will be discussed more extensively in the next empirical chapters. Again, this discourse relates to the interpretation of efficiency as discussed in the previous chapter. In that chapter, two different interpretations of efficiency were discussed. In this discussion, it was concluded that the interpretation as the efficient use of public financial resources cannot be regarded as a central goal of integrated water management. The same could be argued for the other dimensions of rationalisation. However, just as more content related goals of water management, they may be goals of water management as a whole. Besides, off course, there is an interaction between these two goals (efficient use of public resources and achieving integrated water management), in the sense that they either conflict or reinforce each other, depending on the way integrated water management is interpreted (which emphasis and ambitions) and the way water management is organised.

EMERGENCE OF POST-MATERIAL VALUES

The trend of the emergence of post-material values can be shared in the sub-categories 'trends in society itself' and 'trends in the man-nature relationship'. This trend can be discussed in terms of the three stages of political modernisation as discussed before ('early', 'anti' and 'late'). The emergence of post-material values is clearly a phenomenon related to the stages of anti- or late political modernisation. As was discussed before, according to Van Tatenhove et al. (2000), society is now in the stage of late political modernisation. Just as ecological modernisation can be regarded as the incorporation of new (ecological) ideas into existing institutions, this can also be argued for 'late political modernisation'. In the era of late modernisation, the certainties of modernity, characterised by relative simplicity and stability, belong to the past. According to some post-modernist theorists contemporary societies show a new or intensified degree of fragmentation, pluralism and individualism, while political, economic and cultural life is strongly influenced by developments at the global level (idem, 44). The result of this fragmentation, pluralism and individualism, is that needs and desires are also increasingly diverse. This can also be argued for the demands and desires with regard to the functions of water systems. Whereas in the era of modernity, water systems had a limited number of functions to fulfil (mainly as a resource or basis for drinking water, agriculture and transport), in the era of late modernity, the number of demands and desires, and thus the number of functions water systems 'should' fulfil for society has increased drastically. Besides the typical modernist and materialistic demands on water systems, a range of non-materialist (or post-materialist) demands and desires have emerged. These functions mainly come forth from the combination of the desire of urbanised citizens to re-establish contact with nature and the search for ways to fill in increasing leisure time. Examples of such post materialistic demands for functions of water, water systems and aquatic ecosystems are all kinds of water sports, demand for the visual beauty of water and ecosystems, and the attention for the value of aquatic (and terrestrial) ecosystems for society. The latter example relates to a growing consciousness of the impact of human activities on ecosystems. This can be regarded as a manifestation of a paradigm-shift in the man-nature relationship, which was identified as the second sub-category this trend is part of. The emergence of these post-material values has resulted in a shift in demands and desires for the functioning of water systems, both in a qualitative and quantitative sense. According to standard economic theory, this shift in demand can be expressed in the willingness of various actors to pay for these functions. Or, to put it in more popular terms, the shifting demands and desires have led to shifting markets and new economic drivers in water systems management. The consequences of this shift and the way in which this shift could be addressed in an economic way (i.e. via the market mechanism and policy instruments regulating these markets) will be discussed in the case study chapters.

COMBINATION OF TRENDS

The trends discussed above may influence each other and may combine into a specific manifestation of these trends. For the purpose of this thesis, it is especially interesting to analyse the combination of the trend towards economisation with other trends discussed. For example, the combination of globalisation (or internationalisation) and economisation can be expected to result in a standardisation of economic policy approaches to societal issues at the international level. Likewise, the trend towards individualisation can be expected to lead

to a wide range of interests in water management, and therefore a wide range of reactions to water policy and management, including policy approaches that try to manipulate these individual economic decision-making processes. Besides, it could be argued that the combination of economisation and individualisation has led to the trend in governance of deregulation. The combination of the emerge of post-material values and economisation may lead to the attempt to express the value of non-priced goods, services and effects in monetary terms. This refers to the monetary valuation of positive values of healthy aquatic ecosystems on the one hand and negative side effects of modernisation on the other, respectively, or, in other words, the institutionalisation and rationalisation of environmental policy through economic policy and management approaches. Ecological modernisation can be regarded as a specific manifestation of this combination of trends, in which existing institutions are used or adapted for this purpose, instead of creating completely new institutions. These combinations of trends in society result in specific trends in governance, which will be discussed further below.

4.2.2 TRENDS IN NATURE

Trends in nature may be autonomous or induced by mankind. With regard to a number of trends in nature, the degree to which this trend is autonomous or induced by mankind is exactly the subject of the ontological discourse about this trend. The outcome of this ontological discourse may be decisive for the normative and strategic discourse. The reason for this is that autonomous trends in nature probably cannot be influenced by mankind. Therefore, measures taken by humans to address these trends can only consist of mitigating or compensating measures. Or, in other words, humans can only adapt to a given situation. With regard to trends in nature fully or partly caused by humans, the dominant discourse may be that these trends can be addressed by measures that can influence these trends themselves, not just their effects, by addressing the cause(s) of these trends. An example is the issue of global warming. The dominant discourse in all arenas is that this phenomenon is caused at least for the most part by human activities, such as deforestation, energy use and air pollution. Part of the measures to address this issue aims to at least slow down and if possible halt and reverse this trend. Until this happens, mankind will have to deal with the effects of this trend. The mechanism related to this trend most relevant for water management is climate change. This mechanism is believed to manifest itself via changing patterns of precipitation and evapo(transpi)ration. As was discussed earlier in this thesis, climate change has led to a number of shock events such as droughts, floods, water nuisance and related effects. Some of these events have also occurred in The Netherlands (such as near river floods in the 1990s and dry summers in the early 2000s) and have resulted in a wide debate about water management approaches to address these events.

Shock events may also be related to water quality, such as occasions of point source pollution⁸⁹ and alarming reports, such as the publication of *Silent Spring* by Rachel Carson in the 1962, focusing attention on the effects of DDT-accumulation in top predators⁹⁰.

⁸⁹ An example of a major case of point source pollution in the Rhine river basin was the large scale spill of chemicals at the Sandoz factory in Switzerland in 1986.

⁹⁰ It must be noted here that there may also be trends and shock events that divert political attention away from water management. Examples of such combinations of trends and shock effects in society are

It may be argued that all of the shock events discussed above were manifestations of the growing confrontation between the economy and nature in the era of modernisation. With regard to these shock events, there may be two basic approaches in policy: addressing the symptoms of these trends by short term mitigatory measures or addressing the underlying symptoms of these trends. In the case study chapters, we will see that both approaches are part of water management, and these approaches may even be used for the same issue, either next to or after each other.

4.2.3 TRENDS IN GOVERNANCE AND THEIR MANIFESTATION IN WATER MANAGEMENT

As was mentioned in the introduction of this section, trends in governance are often closely related to trends in society and nature. In present-day society, in most cases, trends in governance will be a reaction to these trends in society and nature. The reason for this is that the model of the centralistic planning state basing its interventions in society on the desired society and theories about the way to achieve it (i.e. the model based on manageability of society) has become obsolete. Instead, one might say that present day public governance is more based on 'signals' from society and nature, and thus on empirical information. Public governance thus has become more pragmatic in nature. It can therefore be argued that all trends in society as discussed above have their counterparts in governance. A number of manifestations of the trends in society and nature in public policy will be discussed below.

INTERNATIONALISATION OF POLICY AND GOVERNANCE

The trend towards internationalisation of public policy is strongly related to the trend in society towards globalisation. The trend towards internationalisation of policy can also be felt in water management. This international approach to water management has led to the introduction of a number of notions into Dutch water management derived from international policy, including the notions of the absolute and relative scarcity of water, and water and aquatic ecosystems as finite natural resources. Besides, international policy explicitly recognised the large range of interests related to water. According to Schuijt (2003: 88), international reports show that water is no longer seen as the abundant resource it once seemed to be, and it becomes increasingly important to meet the different interests in water. At the same time, the general perspective on water management and environmental issues has shifted towards a pragmatic, problem-oriented perspective in which current institutions are perceived as capable of dealing with most environmental issues. This perception of 'new solutions through (adjustments to) existing institutions' is part of what Hajer (1995) and Van Tatenhove et al. (2000) refer to as 'ecological modernisation' (see later). Van Tatenhove (2000: 3) defines ecological modernisation as an '... ecological transformation of the industrialisation process towards a direction in which the maintenance of the 'sustenance

political-religious conflicts manifested in terrorist attacks and economic crises, manifested in all kinds of socio-economic problems.

base of society' can be guaranteed, while reconciling economic growth and the ecological imperative'. As such, it fits the definition of 'sustainable development' as introduced by the Brundtland-committee (see WCED, 1987). A key characteristic of ecological modernisation is that it '... introduces concepts that make issues of environmental degradation calculable' (Hajer, 1995: 26). The market plays a central role in environmental management, where calculability of environmental effects is the key to internalisation of environmental costs⁹¹. Ecological modernisation can thus be seen as a combination of (or 'compromise between') ecological and economic approaches and between existing institutions and new (environmental) goals. It matches most closely with the man-nature paradigm of 'resource management' (see chapter 3). The concept of 'eco-pragmatism' as introduced by Saeijs can be seen as the equivalent of ecological modernisation for the management of ecosystems. This approach advocates managing these systems on the basis of scientific information about their functioning and their reactions to human interventions. Eco-pragmatism is thus also based on a rational approach to ecosystems, taking calculability as the starting point of interventions.

Consequences of internationalisation for Dutch water management

Processes that surmount the borders of the nation state of The Netherlands have and have had a major influence on the way policymaking in Dutch water management is perceived nowadays. With an ever growing global population, there is an increasing pressure on the world's water resources. This development is augmented by an increasing consumption of natural resources per capita. According to Saeijs and Van Berkel (1994), four major problems concerning fresh water may be defined as:

- A shortage of renewable fresh water supplies;
- Unequal distribution of fresh water supplies;
- Problems of water quality and health;
- Negative effects of unrestrained fresh water ecosystem development.

In the international arena, numerous organisations have deliberated about the question how to address these issues. One of the approaches brought forward was the economic approach. Water was termed an 'economic good' for the first time in international policymaking at the Dublin Conference on Water and the Environment in 1992. At the same time, at this conference, the concept of 'Integrated Water Resources Management' was introduced. The following *four principles* were developed (ICWE, 1992):

- Water is a finite, vulnerable and essential resource, which should be managed in an integrated manner;
- Water resources development and management should be based on a participatory approach, involving all relevant actors (i.e. all stakeholders);
- Women play a central role in the provision, management and safeguarding of water;
- Water has an economic value and should be recognised as an economic good, taking into account affordability and equity criteria.

⁹¹ Note that this calculability was identified as one of the dimensions of rationalisation. Ecological modernisation thus does not, as deep ecology does, reject rationalisation (and economization), but aims to modify the existing system 'from within'. It can therefore be regarded as an evolutionary approach to the improvement of environmental quality rather than a revolutionary one.

Schuijt (2003: 87) states that although the notion of water as an economic good has been generally accepted since the conference, the interpretation of this concept is under dispute. In this respect, Van der Zaag and Savenije (2001: 51) distinguish two schools of thought. One school believes that water should be priced at its economic value, so that the market will ensure water is allocated to its highest value use. A second school maintains that 'water as an economic good' refers to the process of integrated decision-making on the allocation of scarce resources, which may not necessarily involve financial transactions. Instead, decisions on water allocation and use should be based on multi-sectoral, multi-interest and multi-objective analysis, possibly involving economic analysis and evaluation⁹². With regard to the first interpretation, a debate is going on about what this 'economic value' is and what it encompasses. Some argue that 'economic value' means calculating 'Total Economic Value (TEV)' (see chapter 3), while others argue that the economic value of water will be determined by supply and demand, and thus by the price it gets in the market.

As shows from this, within the scientific disciplines of economics, several schools may have (serious) disagreements about what it means to regard water as an economic good. These different interpretations of (the application to water management of the) notions of economic value and economic good may be compared to the different interpretations of the efficiency criterion as discussed in the previous chapter. The first interpretation is directed mainly at an efficient use of public financial resources in order to reduce the tax burden, by 'letting the market mechanism do its job' and probably, depending on the party advocating this interpretation, at achieving an economic profit by privatising formerly public water management tasks, while the second is primarily directed at an efficient use of the natural resource water for the conservation of water and aquatic ecosystems. As was argued in the previous chapter, the former approach to the value of water (i.e. through pricing in the market) can only contribute to integrated water management if the total economic value and all effects of market transactions of these good or services are reflected in the price. Keeping in mind the discussion in chapter 3 about the possibilities of expressing the value of goods and services in monetary units, these are tough preconditions, which are not likely to be met completely in reality. The question then is whether or not such a market based approach does a better job in allocating water and aquatic ecosystems to their highest value use than other, non-market based allocating mechanisms. This was referred to earlier as the process of optimising. Apart from this question, the issue remains that the market as an allocating mechanism at most functions on the basis of total *economic* value, not on total *overall* value.

As we will see in the remainder of this chapter, in the discussion of economic elements of water policy at various levels of governance, the rapid process of 'internationalisation of governance' going on in the European Union also has a major impact on policymaking regarding water management in its member states, including The Netherlands. Notwithstanding the debate about its meaning, the fact that water is officially recognised as an economic good at the international level has been a major impulse for what can be referred to in

⁹² The role of economic evaluation in this approach could be to identify the purpose with the highest economic value for the use of the scarce resources of water and aquatic ecosystems. However, this does not automatically imply that these goods and services should be allocated to this highest value purpose via the market mechanism, since some values may not be expressed in the price of those goods and services in the market.

general terms as 'an economic approach to water management'. Another important effect of the internationalisation of water policy, especially at the level of the EU, is that this internationalisation leads to a standardisation of water policy. This standardisation has both positive and negative effects on the use of economic policy instruments. This dichotomy comes forth from different, conflicting goals of EU policy, being environmental policy on the one hand, and creating a level playing field on the other. The influence of both mechanisms will become apparent in chapters 5 and 6 with regard to specific issues in water management.

The fourth white paper on water management (*NW4*) identifies a shift in water policy instruments at the international level, although not one towards the application of economic policy instruments and evaluation methods. The paper states that whereas, similar to national water policy, emphasis in international policy used to lie with detailed juridical setting of standards, the application of different types of more administratively binding instruments keep gaining ground. According to *NW4*, within this framework it is often possible to make agreements that are not achievable in a strict juridical setting (Ministerie van Verkeer en Waterstaat, 1998: 114). This shift therefore seems to provide for better opportunities for flexible approaches to water management issues. Market-based instruments are often advocated because of their supposed flexibility for the target group. Therefore, this shift towards more flexible policy instruments at the international level may be expected to enhance the application of economic steering instruments. However, the shift identified in *NW4* relates mainly to agreements between public and public, and public and private actors with regard to attaining certain (environmental) policy goals and usually does not focus on generic economic steering instruments (market intervention). Moreover, economic steering instruments require the issuing of a specific law, which can be regarded as a strict juridical setting. In contrast, agreements between public and private actors as referred to in *NW4* often relate to the distribution of financial and economic costs and benefits, especially with regard to the provision of (public) facilities to society (f.e. public building projects). Therefore, this shift in governance may result in increased application of public-private partnerships which could be addressed and analysed from the perspective of new institutional economics.

DEREGULATION

The trend of deregulation can be regarded as the reaction of the public domain on certain trends in the private domain, such as an increasing call for individualism, liberalism and efficiency. This trend can be described in terms of political modernisation, as a process that can be typified as a shift from 'government' to 'governance'. In the era of 'government', public authorities played an active role in providing services to society that private actors would not automatically provide via the market mechanism. This situation was in line with the idea of the 'manageability of society', which was discussed before. In the last decade, the 'government'-approach of public authorities received a lot of critique, mainly with regard to excessive regulations and administrative costs. As a consequence, the public management approach has gradually shifted from 'government' to 'governance'. According to theory about the 'governance'-approach, public authorities limit their actions as much as possible to setting the conditions according to which private actors provide goods and services to society. As such, the shift from government to governance was strongly influenced by the

economic definition of rationalisation, mainly reflected in the call for increased efficiency of the provision and allocation of goods and services in general and the role of public institutions in this process in particular. Efficiency became dominant in the normative discourse about the role of the government in society. In other words, in discussing the role of the government in society, there was a strong emphasis on the high costs of this government for society and thus on the need for greater efficiency in the functioning of this government. This, amongst others, resulted in proposals for deregulation of public tasks to either private actors or lower levels of government.

In order to reduce administrative costs and the surplus of bureaucratic regulations, the Dutch central government started an operation in the 1990s called '*MDW-operatie*'. *MDW* stands for *Marktwerking, Deregulering en Wetgevingskwaliteit* (Market approach, Deregulation and Legislative quality). The goal of this operation is to decrease the number and costs of public governance activities, reduce the degree of regulation by public authorities and increase regulation (allocation) through the market mechanism. The envisioned way to achieve this goal is the abolishment of regulations limiting competition, the reduction of the regulatory and administrative burden to the minimum and the improvement of the quality of legislation. Various actors have an interest in this shift from government to governance, ranging from fundamental (a paradigmatic belief in the freedom of the individual) to pragmatic (f.e. the hope of reduced tax burdens for entrepreneurs). This operation is likely to have consequences for water management as well. In fact, the *MDW* operation was discussed as a separate issue in water management in *NW4* (Ministry of V&W, 1998). In the light of the debate about the interpretation of the efficiency-criterion, the focus on market operation and deregulation may shift the balance from the efficient use of natural resources to the efficient use of public financial resources. (The consequences of) This operation and the general trend underlying it will be discussed in more detail later this chapter, in discussing the organisation and financing structure of Dutch water management, and in chapters 5 and 6.

INSTITUTIONALISATION AND RATIONALISATION OF ENVIRONMENTAL POLICY

The trend in governance towards institutionalisation and rationalisation of environmental policy can be shared in the sub-category of 'trends in the man-nature relationship'. According to Schuijt (2003: 80 a.f.), the policy paradigms that are specific for water management in The Netherlands are directly linked to the changing perception of environmental issues at a more general level. Schuijt argues that two major developments can be perceived in this changing perception: (1) institutionalisation of environmental problems, and; (2) rationalisation of society. With regard to the first development, the following can be remarked: since the 1960s, environmental problems have become institutionalised in most Western countries as important social problems. The adoption of the United Nations Environmental Program (UNEP), resulting from the 1972 United Nations Conference on the Human Environment in Stockholm, marked a transition from the '... naïve environmentalism of the 1960s to the more rational, political and global perspective of the 1970s' (MacCormick, 1995: 107). The institutionalisation of environmental problems was accompanied by a serious change in attitude. While the 1960s and 70s were dominated by romantic and esthetical motives for environmental protection, the 1980s were characterised by a more pragmatic focus on environmental problems, based on the concepts of scientific

ecology (Leroy and de Geest, 1985). Scientific foundations for protection and management of ecosystems had become increasingly important, a process known as 'scientification of nature protection' (idem: 32).

As was discussed before, one of the core aspects of integrated water management is the balanced weighing of interests in water management and a comprehensive analysis of the effects of water related activities (by both private and public actors). This explicitly includes the effects of water related activities on the (aquatic) environment. This approach can be indicated as a 'holistic' approach, in which the interests in and effects of activities related to water management are mapped from an ecological, social and economic point of view⁹³. Compared to the former sectoral water management, in which especially (a limited set of) economic interests were well represented and well served by water management, the (theoretical) aim of integrated (or rather: interactive) water management is to develop especially the environmental and social dimensions. The integration of environmental and social dimensions into all kinds of decision-making processes in public policy (and in decision-making processes by private actors) is an important aspect of the institutionalisation of these dimensions.

The other trend related to environmental policy is that towards rationalisation. This trend was already addressed in the discussion of trends in society. The link between the two trends and environmental policy can be explained as follows. The first step in the institutionalisation of environmental problems was the rise of the independent policy domain of environmental policy (trend (1) towards institutionalisation of environmental problems). This was mainly done by rationalising environmental problems via the separate scientific discipline of environmental sciences. The next step, as seen by many, is the integration of environmental concerns in other policy domains, which was also described above. This can be done amongst others by incorporating environmental aspects into the scientific disciplines that substantiate policy in these domains. For example, this involves the rationalisation of environmental concerns in mono-disciplinary scientific disciplines such as civil engineering and economics. In economics, the ecological dimension can in theory be included in economic analysis by valuing the not standardised values and effects of human (economic) activities (externalities) in monetary terms. However, since these values and effects are by definition not yet standardised (institutionalised) in economic analysis, they do not have a strong position in economic analysis yet. Because of the importance of this step towards integration, it was decided that the analysis of the use of economic policy instruments in Dutch water management as performed in this thesis should focus especially on the integration of the ecological dimension into the economic dimension.

Schuijt (2003) applies a similar type of reasoning. According to her, the combination of the two processes discussed above – institutionalisation of environmental problems and rationalisation of society – influences specific policy paradigms, including those in water management. She states that an increasing environmental awareness calls for increased integration of environmental effects in decision-making processes (institutionalisation of

⁹³ In recent years, the tendency towards a holistic, sustainable approach can be distinguished in several policy domains. In business, sustainability is usually interpreted as paying attention to all three aspects of sustainability, being 'people, planet and profit'.

environmental problems), while rationalisation introduces concepts to make environmental issues calculable, so that they can be integrated in existing institutions. New techniques are necessary that allow organisations to integrate environmental policies into their cost-benefit calculations. This trend reflects the belief that hard data lead to hard facts, and thus to a higher validity of these facts (In 't Veld, 2000). As such, rationalisation can be seen as a variation on the trend of scientification. The trend of ecological modernisation, also identified by Arts et al. as a long-term trend related to environmental policy, can be seen as a result of this rationalisation of environmental protection. A strong motive for a more rational approach to environmental protection is that actors in the business of protecting the environment realised that if they would not adapt their approach in the direction of rationalisation, they would not be able to gain access to decision-making processes in especially the political arena, since the dominant normative discourse is based on a scientific or rational approach to policymaking. This mechanism can be referred to as the theme of 'adaptation'.

The discussion of rationalisation above shows that the concept of rationality has different meanings when perceived from different perspectives. These perspectives are represented by different scientific and policy paradigms. From an ecological and environmental science perspective, rationalisation has led to a scientification of nature protection, including ideas like 'ecological modernisation' and 'ecologicalisation of the economy'. Rationalisation seen from an economic perspective leads to increased efficiency, calculability, predictability and control from an economic perspective. The notions of calculability, predictability and control also play a large role in the scientific discipline of civil engineering, but from a different perspective, namely via the approach of 'scientism'. This latter scientific discipline has been dominant in Dutch water management during most of the 19th and 20th century. In the last few decades, both the economic and the ecological/environmental disciplines have tried to increase their influence on water management dominated by civil engineering. One of the strategies of these disciplines to achieve this is by adopting the rational approach which once was the exclusive domain of the engineers and giving it an own, different meaning. There is, so to say, a struggle for discursive hegemony going on with regard to the concept of rationality. Representatives of the ecological discipline are trying to get some 'ecological sense' into economics and civil engineering, and representatives of the economic discipline are trying to get some 'economic sense' into ecological approaches and civil engineering. And civil engineering is trying to adapt to these new influences by redefining their understanding of a rational approach and by adapting their practices in water management to these new influences and this new definition. This adaptation is often done by integrating some economic and ecological notions into civil engineering design (compromising, innovating), sometimes by using economic arguments to prevent ecological approaches. When characterising the strategy of civil engineering with regard to the influences of these different disciplines, one may argue that this strategy fits the trend of ecological modernisation. The key aspect of this trend is that changes towards a more (ecologically) sustainable society is evolutionary rather than revolutionary in nature, because new ideas are embedded into existing institutions, so that change is necessarily incremental. The exact mechanism through which the dominant scientific approach in water management (civil engineering) reacts to the influences from other scientific disciplines and societal movements depends on the interests at stake. This is a matter for analysis of single issues and arrangements in chapters 5 and 6.

ECOLOGICAL MODERNISATION

The trend towards ecological modernisation can be regarded as a specific form of the rationalisation of environmental policy. This form of rationalisation focuses on incorporating notions about the environment and ecology in other scientific disciplines and policy domains. Besides, ecological modernisation is also related to the emergence of post-material values, since attention for the environment can be regarded as attention for non-material matters (as opposed to material matters which are the main focus of attention of disciplines and schools resulting from modernism). The incorporation of environmental policy in the domain of water management is shortly described below.

Water management has traditionally been a public task that was performed by specialised, techno-centric, functional public bodies, that were assisted by (mainly technology-oriented) scientific institutions. In these functional bodies, consisting of mainly (specialised) civil servants, the presence of the political element (in the common, democratic sense) was very limited. In this setting, there was little involvement in water management from either the political or the societal arena. In recent years, due to a number of trends in nature, society and governance, issues of water management have to some extent been 'politicised' and 'socialised', meaning that they have become subject to societal and political debate. However, the interest and involvement of the general public and other stakeholders is not yet as widespread as desired by those calling for a (true) integrated approach, in the sense as described by Van Ast (2000) as 'interactive water management'⁹⁴. The same, to some extent, counts for the political arena, in which attention for water management seems to be dominated by shock events, which draw attention to the subject for a while, after which it fades away again. This mechanism was described by Downs (1972) in addressing the 'issue attention cycle'. However, integrated water management per definition involves looking at effects of human activities on water systems over long periods of time. Therefore, this approach requires a long-term vision on and long-term attention for water management. This, in turn, requires the institutionalisation of integrated water management. Ecological modernisation aims to achieve this by integrating the ecological component into existing policy domains and scientific disciplines.

Despite the incomplete intergration and interaction, the politisation and socialisation of water management have unmistakably lead to a degree of integration of policy domains. This also counts for the integration of environmental policy and water policy. As was discussed before, the way this integration took place can be interpreted in terms of ecological modernisation, i.e. the incorporation of notions from ecological science into the everyday practice and existing institutions of water management. Besides, in the past decades, a number of institutions were introduced to ensure continued attention for water in other policy domains. Examples of such institutions are various instruments to incorporate water into spatial planning processes, a national account based on water related activities and permanent commissions with a political mandate focusing on water management for the long-term in the face of political, societal and fysical changes.

⁹⁴ Such a truly integrated approach would require a (more) active involvement of all stakeholders in all three discourses mentioned above, or at least in the normative and strategic ones.

As was discussed earlier, in the past few decades, the shift from an agricultural and industrial production society towards a more service-oriented society on the one hand led to a concentration of the population in cities, and on the other hand to more leisure time and shifting demands with regard to the water system. These demands included post-material demands such as possibilities for recreation, restoration of nature, including aquatic ecosystems, space and quietness. These post-material demands result in higher quality standards for recreation and nature, including higher quality standards for water systems and aquatic ecosystems. As a consequence of these trends in the preferences of society, an important aspect of integrated water management is therefore the integration of non-material interests in decision-making processes in water management. One possible way to do this is to incorporate ecological and environmental considerations in economic decision-making. As was discussed before, the combination of the trends towards economisation and ecological modernisation has led in recent years to an ecologising of the economy and an economising of ecology, including in water management. It must be noted that so far the ecologisation of the economy has been institutionalised to a higher degree than the economisation of ecology. Or, in other words, the anchoring of environmental and ecological principles in the economy has proceeded further than the expression of the value of ecosystems for society in monetary terms (either or not via pricing). For both mechanisms, however, it can be said with a large degree of certainty that their full potential has not been reached yet.

4.3 WATER POLICY IN THE EU, ITS MEMBER STATES AND EEA-COUNTRIES

4.3.1 INTRODUCTION

In this section, a number of elements of European water policy will be discussed that are general in nature and that apply to all or several issues in Dutch water management. Examples of such general elements are policy principles and general policy goals, basic concepts and management programmes⁹⁵. As was mentioned before, more issue related elements of policy will be discussed in chapters 5 and 6. An exception to this is the comparison of the application of economic steering instruments in EU-Member States and EEA-countries, which will be discussed in this section. Although this comparison addresses specific (as opposed to general) elements of policy, the arrangements in which these instruments are embedded will not be discussed in detail. For that reason, this comparison does not fit in the case study chapters 5 and 6 and will be discussed in this section. It provides an overview of economic steering instruments applied in these countries and as such gives a rough benchmark of the degree to which these instruments are applied in The Netherlands as compared to other European countries. The comparison of the application of economic steering instruments in The Netherlands with that in other countries was identified in chapter 3 as one of the points of reference to determine the degree of application of these

⁹⁵ Note that policy paradigms were already discussed from a general perspective in chapter 3. Specific manifestations of these paradigms will only be discussed in the empirical chapters if considered relevant for the analysis of specific issues.

instruments in Dutch water management. Another distinguishing criterion between the objects of analysis of this section as compared to those of chapters 5 and 6 is that this section discusses policy resolutions regarding the use of economic policy approaches in water management, while chapters 5 and 6 address the (discourse about the) application of such economic approaches in real governance arrangements.

This section is divided roughly into two parts. Subsection 4.3.2 will address policy goals and principles of EU water policy considered relevant for the application of EIs and EEMs in Dutch water management. Subsection 4.3.3 will address more concrete elements of water policy at EU-level and in EU- and EEA-countries, such as policy concepts, programmes and instruments.

4.3.2 CENTRAL GOALS, PRINCIPLES AND REGULATIONS OF EU-WATER POLICY

CENTRAL GOALS AND DIRECTIVES OF EUROPEAN WATER POLICY

Introduction

In recent years, the influence of policymaking at the European Union level on the national water policy of its member states has increased significantly. This subsection will first give an overview of the main policy goals, concepts and formal institutions at European level related to water management and will then provide insight into the main principles formulated at this level considered relevant for an economic approach to water policy. In order to be able to place the goals, principles and regulations discussed in this subsection in perspective, a short overview will be given of the history of European Union water policy first.

A short overview of European Union water policy

European Union water policy has developed since the beginning of the 1970s, along with the first Environmental Action Programme. Because of this co-development of EU water policy and EU environmental policy, the principles formulated in EU environmental policy play a large role in EU water policy as well⁹⁶. This is logical if one considers water policy to be an integral part of environmental policy. It was already discussed in chapter 3 that the integration of the policy domains of water and environment started in the 1970s and 1980s and that therefore, many environmental principles have been adopted in water management. According to ENGREF et al. (2003), three generations of EU directives for water management can be distinguished. A first generation (1973-1988) mainly focused on the protection of water used for human activities. Measures were taken regarding drinking water standards and the control of emissions of particular harmful substances (Hansen and Kraemer, 2000). The basic driving forces behind this first generation of directives were twofold: firstly, harmonisation of environmental law to remove trade barriers and to avoid distortion of competition, and secondly, the protection of public health (Kallis and Nijkamp, 1999). It can thus be stated that the introduction of these directives was based on economic and anthropocentric motives.

⁹⁶ See for example the discussion of EU policy principles for water management later this subsection.

A second generation of directives (1988-1995) completes the initial phase with more specific measures (e.g. purification of urban wastewater or limitation of manure spreading) following a command and control approach. These directives focus more on pollution prevention and setting emission standards regarding specific sources of pollution, due to the deterioration of the environmental quality of water bodies from sewage pollution and nitrates and phosphates from agriculture. Over this period, the range of policy instruments was extended to informative (e.g. the harmonisation of labelling and packaging of pesticides), voluntary (e.g. the code of good agricultural practice) and economic instruments (more indirectly through e.g. fees on water discharges). This second generation does not repeal the first but rather completes it, trying to use new instruments in order to reach the existing objectives.

Since 1995, a third phase has begun with the preparation and adoption of the Water Framework Directive. This evolution, according to ENGREF et al. (2003), is not only guided by a continuous depletion of water resources in the Member States, but also by broad changes in the philosophy of the European construction (e.g. the principle of subsidiarity). The authors argue that a shift to renewed water policy is not so much due to a lack of results of EU water policy as to the burden of the costs of conformation to the new requirements. The argument is thus that this shift is guided more by considerations of efficiency (and general principles for and consequences of EU policies and implementation) than of (environmental) effectiveness. ENGREF et al. (2003) mention four circumstances leading to reform:

- Financial burdens grow as the Economic and Monetary Union (EMU) requires budgetary austerity. Many MS escape financial difficulties with a (partial or total) privatisation of water services (e.g. in UK);
- Second, the MS have substantial difficulties to conform to the EU water laws (Sbragia, 1997; Liefferink & Andersen, 2000). All of them face several and severe condemnations from the Court of Justice;
- Third, the principle of subsidiarity, introduced by the Treaty of Maastricht, calls for more decentralisation of decision-making;
- Fourth, the Commission initiates three new proposals on drinking water standards⁹⁷, hazardous substances and the ecological quality of water⁹⁸.

The circumstances leading to reform as discussed above can be regarded as impulses for change in EU water policy. The first impulse can be shared in the category of 'changes from within', as the weight of the administrative burden makes the arrangements based on these regulations topple under their own weight. The second impulse can be shared in the category of 'internationalisation of policy', in which the super-national organisation of the EU introduces new powerful political institutions for water management in its Member States. The third impulse can be shared in the category of deregulation and the fourth again in the category of internationalisation, combined with a standardisation of policy (which can be interpreted as a specific manifestation of the rationalisation of society, enhancing predictability).

⁹⁷ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption.

⁹⁸ Proposal for a Council Directive on the ecological quality of water, COM(93) 80 final, 8 July 1994, OJ C 222/6 of 10 August 1994.

EU-directives

A number of EU-directives directly relate to water management. Below, the main directives are listed, shortly describing their field of application⁹⁹:

- Bathing Water Quality Directive (Council Directive 76/160/EEC concerning the quality of bathing water) and its proposed revision : bathing water quality of rivers, lakes and coastal waters;
- Discharge of Dangerous Substances Directive (76/464/EEC) and the Priority Substances under the Water Framework Directive: dangerous substances and pollution control from industry;
- Urban Wastewater Treatment Directive (91/271/EEC): water pollution originating from urban wastewater and certain industrial sectors;
- Nitrates Directive (91/676/EEC) : water pollution caused by nitrates from agricultural sources:
- Drinking Water Directive (98/83/EC): drinking water quality;
- Water Framework Directive (2000/60/EC): general European water policy directive: river basin (quality) management.

All mentioned directives except the Water Framework Directive (WFD) are directives relating to specific sources of pollution or to quality requirements for water bodies with a specific function for society (bathing water, drinking water, etcetera). As can be seen from the dates of effectuation of the directives, the issue specific directives mentioned were issued before the issuing of the WFD. As was mentioned before, the WFD is a framework directive, with a larger scope than the other directives. In most cases, the WFD is supplementary to the existing directive. In some cases, however, it overrules (parts of) existing directives, which are therefore repealed. An example of such a directive is Directive 76/464/EEC(18) for control of pollution by dangerous substances. The WFD can thus be said to be the most comprehensive and (thus) important directive for water management at the EU level at this moment, describing general approaches for water systems (quality) management. Therefore, it will be described in more detail below, focussing on economic elements of the directive. Other EU-directives are not addressed explicitly in this chapter.

As shows from the discussion of EU-regulations above, the emphasis in EU-water policy is on water quality. Reasons for this focus were not analysed in this thesis. However, one could think of a number of reasons arguing from a general knowledge about the organisation of water management. The first is that it is easier to introduce generally valid water quality standards than generally valid water quantity standards. Whereas the desired water quality regime is relatively easily transferable across water systems, the desired water quantity regime will depend very much on the availability of water and the purposes for which the water is used. These conditions are highly location specific, and therefore not easily generalisable (for example by formulating categories of water quantity regimes). As a consequence of the location specificity of water quantity issues, these issues can only be addressed at a centralised level by means of very general principles. Going into such issues in detail could easily get the EU involved in politically sensitive debates between member

⁹⁹ Source: <http://europa.eu.int/comm/environment/water/index.html>

states and it may be an explicit choice of the EU to remain detached from that type of debates in order to maintain some degree of independence, objectivity and supremacy.

A second reason, which may partly be a result of the former, may be that water quality management is regarded more as an international policy issue than water quantity management. Whether this can be argued from the perspective of the specific characteristics of water quality and quantity issues was not analysed in this thesis. However, the general focus on environmental quality at the EU level may be explained by the fact that policy for regulating the quality of natural resources has been better institutionalised at EU-level than policy for regulating the quantity of natural resources. Whereas water quality issues are addressed at the EU-level, generally speaking, transboundary water quantity issues are regarded as bilateral or multi-lateral issues to be addressed at the level of river basins, and consequently, institutions addressing these issues have been organised at this level, such as international river basin committees (see for example Van Ast, 2000). Issues of water quantity management are usually addressed by the EU only if the availability of water is related to the quality of ecosystems.

The Water Framework Directive (WFD)

In 2000, the European parliament and European Council published 'Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework directive for Community action in the field of water policy', in short the EU Water Framework Directive (WFD). The tendency towards 'framework regulation' at EU level was already recognised in the *NW4* (Ministerie van Verkeer en Waterstaat, 1998:114). The EU Water Framework Directive is regarded by this paper as promising, especially with regard to recognising and facilitating the river-basin principle, embracing the concept of integrated water management and improving existing regulations. In principle, the WFD covers all aspects of water systems management (water quality and quantity, ground water and surface water, fresh water and salt water) but it takes river basins as a central perspective. Therefore, its focus is on fresh water management. Moreover, the emphasis of the directive is on water quality management, especially related to pollution by toxic substances. Water quantity management aspects are mainly addressed from the point of view of the importance of healthy aquatic ecosystems and not, for example, from the viewpoint of safety. Since the WFD is a framework directive, it sets out general guidelines for water management in its Member States¹⁰⁰.

Goal(s) of the WFD

Because of its comprehensiveness, it is assumed that the list of principles included in the WFD is fairly exhaustive. The discussion of the principles that lie at the basis of EU water policy therefore focuses on the principles of the WFD. As was explained in chapter 3, policy principles serve as guidelines to translate paradigmatic views on water management, and general policy goals formulated as a result of this view, into concrete government action.

¹⁰⁰ The general guidelines of the directive have been elaborated into EU-working papers for specific aspects of policy (such as ecology and economics), which act as guidelines for Member States for elaborating the WFD into specific water policy at the Member State level. The way the WFD is translated into national water policy has to be reported to the EU by its Member States.

Before addressing the policy principles of the WFD, it is therefore important to know the goals of the WFD. These goals will be discussed shortly directly below, together with a number of strategic concepts to help achieve these goals.

The aim of the third phase of EU water policy as discussed above was (and is) to cover several directives aiming at the regulation of specific water related activities with an 'umbrella directive' for water management¹⁰¹. The WFD's primary goal is the achievement of a 'good ecological status' for all water bodies within its territory. As such, the WFD can be regarded as a directive on the ecological quality of water systems. The WFD rationalises EU water policy (witnessing the principles of 'planning and rational management' and 'evidence based policy') and co-ordinates national water policies following a combined 'resource and ecosystem'-approach (or, in other words, the resource 'water' encompasses complete aquatic ecosystems and/or water systems. The challenges raised by the WFD are approached through three perspectives: the ecological, the economic and the institutional perspective. These three perspectives also form the basis for the formulation of policy principles for making the WFD operational. As was discussed before (see Russel, 2001), an institutional approach is typical for economic analysis. Therefore, the approach of the WFD comes close to a combination of an ecological and economic approach. The link between these two can thus be expected to play an important role in operationalising this directive. Since there is considerable focus on water systems as ecosystems and since river basins are regarded as one ecosystem, the unit of analysis for water management measures are complete (international) river basins. This holistic approach to ecosystems is reinforced by a holistic analysis of the effects of human activities on water and aquatic ecosystems and the value of healthy aquatic ecosystems for human society. As such, EU water policy as formulated in the WFD can be regarded as meeting the requirements of integrated water management to a high degree.

POLICY PRINCIPLES IN EU WATER POLICY

The position of principles in policy

In this section, I will address the policy principles that lie at the heart of EU water policy. The purpose of this discussion is to compare the principles of EU water policy with the principles of integrated water management as presented in chapter 2. This exercise will provide insight into the degree to which EU water policy meets the starting points of integrated water management. Policy principles may not be explicitly formulated at every level of policymaking. Especially the higher levels, such as global, international, EU- and national levels tend to base their policy on policy principles, since these tiers are more concerned with strategic policy than with tactical or operational policy¹⁰². At lower levels, policy principles will

¹⁰¹ This is part of the explanation of the term framework directive. The other part of the explanation lies in the directive acting as a set of boundary conditions within which Member States (including private actors) are 'free to move'. In other words, Member States are delegated the task of formulating and implementing water policy, as long as they stay within the boundaries of the conditions set by the WFD.

¹⁰² Three levels of policymaking are thus distinguished: the strategic, the tactical and the operational level. The strategic level concerns paradigmatic considerations, such as issues of governance and the man-nature relationship. This level includes the formulation of general policy goals and principles as a first step

play a more modest role, since these tiers are usually more concerned with tactical and operational aspects of policymaking. Therefore, often, it will not be easy or possible at all to compare the policy principles, let alone policy paradigms, across levels of policymaking. In order to be able to compare policy principles formulated at the strategic level with policy at lower (tactical and operational) government levels, other elements of public policy will therefore have to be involved, such as policy plans (white papers) and policy instruments. The content of policy plans and the way policy instruments are implemented can give clues regarding the consistency of policymaking and implementation between strategic, tactical and operational tiers of public management. This exercise will be performed later in this chapter with regard to the position of economic policy approaches in policy plans at the tactical level (comparing EU- and national policymaking with policy plans of provinces and water boards). In chapters 5 and 6, the operationalisation of economic policy instruments and evaluation methods will be compared to their suggested application in policy papers. These operationalisations will be discussed in the light of the starting points of integrated water management and the policy principles that lie at the heart of water policy at the EU- and national level.

Policy principles of the WFD

The policy principles of the WFD can be divided into four main categories: ecological, environmental, economic and institutional principles. Since the WFD is primarily directed at achieving a 'good ecological status' of water bodies in Member States, its main principles are ecological in nature. However, the WFD also mentions environmental, economic and institutional principles, mainly to be used as guiding principles to achieve this 'good ecological status', but also for a number of other, subsidiary policy goals at EU-level. Besides these four main categories, a number of subsidiary categories can be distinguished. These concern, for example, general policy principles of the European Treaty. Table 4.1 below lists the ecological, environmental, economic and institutional policy principles identified. These principles will be explained in the remainder of this section. Principles from subsidiary categories will only be presented in so far as they may influence the application of the main principles and/or the achievement of the overall goal of a good ecological status.

With regard to the nature of the main principles, the WFD continues the line of the WCED report 'Our common Future' (WCED, 1987). This is reflected by the adoption of a number of similar principles, such as the precautionary principle, the principle of preventive action, the principle of rectifying environmental damage at source and the polluter pays principle (EU, 2000, preamble 11). The subsidiarity principle is mentioned in preamble 18, stating that 'this Directive should further develop [...] in accordance with the principle of subsidiarity'. Besides, preamble 13 states that 'decisions should be taken as close as possible to the locations where water is affected or used'.

to make these paradigmatic views concrete in policymaking. The tactical level concerns plans and programmes that aim to translate the paradigms, general policy goals and principles of the strategic level into public action. The translation of policy principles into specific goals and instruments plays an important role in this stage. Finally, the operational level concerns the execution of policy via the implementation of policy instruments. It should be noted that the terms 'strategic policymaking' and 'strategic discours' should not be mixed up, since the former addresses the highest level of policymaking, while the latter addresses the lowest level of discours.

Table 4.1 : ecological, environmental, economic and institutional policy principles at EU-level

Category	Principle	Short explanation/comment
Ecological principles ¹⁰³	Good ecological status, environmental protection, conservation	The overarching ecological objective. Newly introduced in the WFD.
	(Ecological) Sustainability	Balancing people, planet and profit, keeping a long-term perspective, reasoned from an ecosystems logic;
	Principle of water protection	Water protection as a starting point for EU and MS policy
	Principle of non-deterioration (stand-still principle)	Included in the WFD. Prohibits a deterioration of the environmental status of a water body
	Principle of integration	Integration of environmental aspects/concerns in (other) sectoral policies.
	Principle of planning and rational management	This principle refers to policy based on information gathering
	Integrated basin management	This principle refers to a management approach in which all interests and all effects of human activities and natural phenomena in the entire river basin are considered.
Environmental principles	Principle of preventive action/prevention principle	This principle aims at prevention at source (aimed at the root cause of a problem) instead of end-of-pipe measures or mitigating action (treatment of the symptoms)
	Principle of correction of environmental damages, preferably at the source/rectification of environmental damage at source	This principle was introduced in the WFD, derived from the more general 'prevention principle'.
	Precautionary principle	See text below
Economic principles	Polluter pays principle	See text below
	(Full) Cost-recovery principle	See text below
	Cost-effectiveness/economic efficiency	See text below
	Derogation in case of disproportionate costs	See text below
Institutional principles (water specific)	Evidence based policy principles	See text below
	Public participation principle	See text below
	River basin management plans and basin management authority	See text below

(Source: adapted from ENGREF et al., 2003)

¹⁰³ The development path followed by EU water policy is very similar to the general development path of the environmental policies in the European countries (see Jänicke & Weidner, 2002). Initially, the EC acts in the field of the environment without having any legal competency recognized in the Treaty of Rome. The first articles concerning the environment appear in the Single European Act of 1986 (article 130R). They introduce guiding principles for the conduct of EU environmental policy, being the prevention principle, correction at source principle and polluter pays principle (De Sadeleer, 2002). In 1992, the Treaty of Maastricht (article 130S) completes the orientation, adding the precautionary principle and the integration of the environment in sectoral policies. Finally, the Treaty of Amsterdam of 1999 (articles 174-176) extends co-decision-making (in this procedure, the EU Parliament and the Council share legislative power. The Commission sends its proposal to both institutions) to most environmental questions, except a.o. water quantity. The WFD is the first legal text that benefits from that latest institutional reform. As a consequence, EU water policy is nowadays based on a sound legal base of constitutional level.

EXPLANATION OF THE CORE PRINCIPLES

Ecological principles

Good ecological status

This core objective of the WFD should allow for the improvement of aquatic ecosystems, land and wetland ecosystems. According to this 'principle' (which in fact is a policy goal), MS have the duty to protect, improve and restore the water bodies in order to reach the 'good status' as of 2015. These objectives are legally binding. The traditional concept of water quality, until recently related to just the physical and chemical characteristics of water (from an anthropocentric perspective), is re-focused on biological parameters, related to the health of ecosystems. From the new, ecological perspective, the quality level of a water body is related to its potentialities as a habitat. This consideration is reflected in the (high) standards for water quality.

Operationalisation and implementation

According to ENGREF et al. (2003), the concept of good ecological status is a new and without any doubt the most important concept introduced by the WFD. Unfortunately, they state, the Directive in its final form is open to contradictions, especially with regard to the implementation of the objectives for reaching and conserving this Good Ecological Status. They argue that leaving the responsibility for establishing these environmental targets to Member State governments guarantees a contradictory process of implementation for this Directive. The possibility of declaring any water body as Heavily Modified will give MS the opportunity to flout the objectives of reaching an ambiguous *Maximum Ecological Potentiality*. Because of its fuzzy definition, it can be stated that the concept of good ecological status is similar in nature to policy concepts like integrated water management and sustainable development, which also leave operationalisation to the discretion of lower levels of governance and private actors.

Sustainability

Contrary to previous, sectoral water management, the WFD places the issue of water management in the area of the environmental issues. According to this view, water can no longer be considered as a simple productive input and must be conceptualised as an *eco-social asset* (where 'eco' synthesises both the economic and ecological values involved). Under this approach, *the value of water* goes beyond the monetary value of its productive utilities. The introduction of the principle of sustainability brings a new emphasis to European water policy. It reinforces the more general principle of water protection (see below), recommending attention for the protection of the water resource in a long-term perspective (article 1 of WFD).

Principle of water protection

This principle emerged in the first phase of EU water policy and at first was focused very much on the quality of water for human use. Therefore, monitoring focused on parameters indicating the quality of water for human use and the danger of pollution for this use. With the priority given to conservation of aquatic ecosystems, the traditional concept of water

quality was reformed (as was mentioned above)¹⁰⁴. This shift means that the good quality of water is not only strived for from an antropocentric perspective, but first and foremost from an ecocentric perspective. Besides, the policy objective of the WFD is not only to reach a good quality of water but also to guarantee or restore the aquatic ecosystems. According to ENGREF (2003), it would therefore be more appropriate to talk about an 'ecosystem logic' instead of a 'resource logic' in order to typify what they regard as a paradigm shift introduced by the WFD.

Non-deterioration principle

This principle is in force since the directive was published in December 2000. The aim is to avoid any possible policy that could induce significant deterioration in the present ecological state of ecosystems. The principle firstly aims at the protection of the state of aquatic and terrestrial ecosystems (article 1.a of the WFD), and then their improvement and the sustainable use of water (article 1.b of the WFD).

Principle of integration

Sustainable use of water requires the transversal analysis of all uses, applying the principle of integration (ENGREF, 2003: 73). This principle states that environmental protection must be integrated into the definition and implementation of community policy actions (article 6 of TEC). For this reason, the WFD advocates a greater integration of protection and sustainable management of water in other community policy areas. This interpretation of integration is in line with the interpretation of integrated water management as discussed in chapter 3. Whereas in the explanation of this principle, the emphasis is on integrating sustainable use of water in other community policy areas, this way of reasoning could also be applied to water management itself. In chapter 2 of this thesis, integrated water management was interpreted as that type of water management in which all interests are included in decision-making about water management *and* which includes all effects of human activities on water systems in analysis and decisions. The second part of this explanation of the concept is in line with the principle of integration as explained above. The first part differs from this principle and is similar to the EU principles of public and stakeholder participation. According to ENGREF (2003:74), the situation of having to deal in water management, besides with economic, with environmental, social, cultural and ethical values, which very often are inconsistently measurable with money, makes it difficult to manage water via markets. They argue that the complexity of handling the principle of integration with so many different fields involved and the complexity of managing water under the territorial scale of the river basin does not fit well with the market ethos.

Principle of planning and rational management

The Principle of Planning and Rational Management (articles 5 and 11 of the WFD) is a consequence of both ecosystem logic and the principle of integration (ENGREF, 2003:73). The WFD requires the development of an integrated ecosystem approach based on the river basin, that would bring more coherence to water policy. It is also in line with the principle of evidence based policy (see further below), which aims to base policy on sound information, a.o. on the state of the ecosystem and the effect of policy measures. Although the principle

¹⁰⁴ Note that the measurement of the quality of water in physical, chemical and biological parameters are successive stages in the rationalisation (or scientification) of environmental issues and policy.

of planning and rational management as such does not focus on ecosystems, and therefore does not qualify as an ecological principle, the specific interpretation of the principle in the framework of the WFD, aiming for planning and rational management based on ecological information, does legitimise sharing it in this category.

Integrated basin management

The WFD proposes to set up integrated river (basin) management. The directive is not explicit in defining this term, but some elements help to delineate the concept. First, integration is expressed in the fact that water is considered as a (natural) resource (resource approach). This approach should lead to a comprehensive analysis of interests and consequences for entire water systems. Second, according to the WFD and papers making this directive operational, integration means administrative co-ordination. Policies are conducted through a single guiding document ((integrated) planning approach) for the whole river basin (territorial approach): the river basin management plan. The management plan contains a description of the resource, broad policy objectives for the river basin, all national and European water legislation affecting the river basin (combined approach) and a monitoring programme. It also describes the (cost-effective) set of measures that will be taken in order to satisfy the objectives for all water bodies in the river basin district. Third, integration means *rationalising* and co-ordinating all policy interventions in the water sector (see institutional principles and the principle of planning and rational management above). From the description of this 'principle', it shows that this approach aims to combine a number of principles, and therefore policy goals: comprehensive management of water as a resource, cost-effectiveness and rationalisation, which can be interpreted as objectifying a level playing field.

Environmental principles

This category of principles has been developed in the formulation of community policy for the environment. As was mentioned before, the main environmental principles introduced by the EU are the prevention principle, the correction at source principle, and the polluter pays principle (De Sadeleer, 2000). In a later stage, the precautionary principle and the integration principle were added.

Prevention principle

The prevention principle (or principle of preventive action) has as its basic tenet that it is better (i.e. more efficient and more environmentally effective) to prevent pollution than to mitigate or repair damage to the environment resulting from pollution. Both the prevention principle and the precautionary principle (see further below) are based on inter-generational responsibility (ethical issues). According to ENGREF et al. (2003), these issues are difficult to take on by markets, and thus are likely to conflict with market based approaches to water management. Both principles include additional risks and uncertainties that are not always taken into account in a competitive market and that should be imposed with precise common calculation rules. This, in general, implies an increase in costs.

Principle of correction of environmental damages at source

This principle is based on the starting point that environmental damage should be corrected at the source of this damage. This means that the principle emphasises measures that prevent pollution or environmental damage rather than mitigate or repair it. This principle

was developed in the WFD and is derived from the prevention principle. It is also closely related to the economic principle of the polluter pays (see further below), meaning that the source itself is made to carry the costs of these preventative measures.

Precautionary principle

The 'precautionary principle' was first developed in environmental law, on a national basis as well as in European Community law and international law. The 1990 Bergen Ministerial Declaration on Sustainable Development defines the precautionary principle as: 'Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'. On the contrary, the precautionary principle calls for preventative action in case of uncertainty, via the imposition of a safety margin (safe minimum standards) into policy. The introduction of this principle meant a kind of 'reversion of the burden of proof'. Whereas before the introduction of this principle, a lack of conclusive scientific evidence for environmental degradation might have meant that environmentally adverse activities were continued, application of the principle would mean that in such cases these activities are reduced or even fully stopped. As was discussed earlier, various fundamental attitudes towards risks can be distinguished. Obviously, the precautionary principle represents a cautious risk attitude. Russell (2001, see chapter 2) argued that economic approaches to societal issues in general are more risk seeking in nature. Therefore, economic approaches and the precautionary principle are likely to conflict in the operationalisation of water policy.

Economic principles

Economic analysis of water use (in its broadest sense) and water management take a central position in the WFD (see later). Therefore, the WFD also introduces a number of 'economic' principles for water management. The most important economic principles are the polluter pays principle, the full cost recovery principle and the principle of cost-effectiveness. These principles will be discussed more extensively further below, together with an important principle that can act as an 'escape route' to prevent costs for water management from becoming excessively high.

While economic principles play an important role in the WFD, it should be stressed that the directive does not call for a one-dimensional 'economisation' of European water management and protection. This manifests itself foremost in article 1 of the directive: 'water is not a commercial product like any other, but rather a heritage which must be protected, defended and treated as such'. The dominant discourse in the WFD is therefore on protecting water resources and water systems, represented by the story lines of 'water as a cultural heritage' and 'water as a basic need'. According to the WFD, economic policy approaches within the framework of the WFD, represented by the discourse 'water as an economic good', should predominantly contribute to the dominant discourse of protection as mentioned above. Economic considerations such as cost effectiveness, economic efficiency and full cost recovery are thus derived or secondary goals. This statement confirms the conclusion in chapter 3 that from a theoretical perspective, economic objectives are not primary goals of (integrated) water management.

Polluter pays principle

The 'polluter pays principle' (PPP) has since long been an element of European environmental policy¹⁰⁵. It was first widely discussed in the United Nations Conference on Environment and Development held in Rio de Janeiro in June 1992. According to the 'Environment and Economics Guiding Principles concerning International Economic Aspects of Environmental Policies' (OECD Recommendation adopted on 26th May, 1972¹⁰⁶), this principle means that the polluter should bear the cost of carrying out the measures necessary to reduce pollution as decided by public authorities to ensure that the environment is in an acceptable state.

The EU WFD is one of the first directives in which the PPP is explicitly incorporated (Preamble 11; article 9), and it plays a significant role in the directive's overall implementation. In general, the main elements of the principle can be summarised as follows:

- Those who damage the environment should bear the cost of such damage;
- The price of a good or service should include the cost of environmental damage that results from the production process by charging polluters for the environmental externalities of the production of a good or service.

(Markandya, R.P. et al. (2001))

In other words, the cost of measures to prevent, mitigate or compensate environmental damage should be reflected in the cost of goods and services that cause pollution in production and/or consumption, either *ex ante* or *ex post*.

By making polluters pay compensation for ongoing activities that deplete resources or otherwise impact on the environment, this principle implicitly provides incentives not to pollute and to introduce more environmentally sensitive practices. Furthermore, if the PPP is applied through environmental taxes or charges, it generates revenue that can be employed towards the recovery of costs associated with the administration of environmental or resource management policies (see also chapter 3). As such, it contributes to the principle of recovery of costs, including the costs of environmental damage and resource depletion (see below). According to ENGREF et al. (2003), this is exactly the way the principle is being operationalised within the framework of the WFD. The PPP is a principle through which economic policy approaches can, in principle, contribute to integrated water management, with respect to including an underrepresented aspect of economic activities (namely effects on the environment) in decision-making by economic actors in markets.

One might argue that the ecological goal of the WFD goes beyond that of the PPP as defined by the OECD in 1972. Whereas the PPP ultimately aims for an 'acceptable state of the environment', the WFD aims for 'good ecological status'. The tone of an 'acceptable state of the environment' is that no irreversible damage is done (precautionary approach), or that the state of the environment will not become such that it negatively influences the health of humans. The tone of a 'good ecological status', on the other hand, is that the quality of the environment should be so high that full grown, mature ecosystems can exist or evolve that can offer services to human society. Therefore, the level of ambition of the WFD goes beyond

¹⁰⁵ Early references to the PPP in EC environmental policy can be found in e.g.: EC Action Programme on the Environment (1973), Council Recommendation (75/436), Waste Framework Directive 75/442.

¹⁰⁶ Note that the PPP was only widely discussed and accepted in global politics 20 years after its introduction

that of the PPP as defined by the OECD in 1972. The PPP as defined by the OECD is basically anthropocentric in nature, while the goal of 'good ecological status' as formulated by the WFD is ecocentric in nature. This difference can be typified as the difference between the standard polluter pays principle (SPPP) and the extended polluter pays principle (EPPP) (see chapter 3)

(Full) Cost recovery principle (including environmental and resource costs)

This principle states that the costs of water services¹⁰⁷ have to be recovered as much as possible. The WFD explicitly states that, in addition to the full (direct) costs of providing the necessary services (investment and operation), 'environmental and resource costs associated with damage or negative impact on the aquatic environment should be taken into account in accordance with, in particular, the polluter-pays-principle' (EU, 2000: preamble 38, Article 9). It can be argued that despite the addition 'including environmental and resource costs', the environmental impact of this principle may be limited, since the definition of water services in the WFD is rather narrow. It only addresses human activities relating to the provision of water for human use and the collection and treatment of wastewater. It does not, for example, involve the products and services aquatic ecosystems provide to society. Another aspect mitigating its consequences is that in the WFD, full cost recovery is not sought after but that the 'Member States shall *take into account* the principle of cost recovery by 2010' and that 'the different sectors (at least industry, households and agriculture) provide *adequate contributions* to the recovery of costs of water services'. The formulation of 'taking into account' has a lower legal status than for example the formulation 'comply with'. It is therefore easier to deviate from the former than from the latter.

Polluter pays principle and full cost recovery

In the context of the WFD, the polluter pays principle is strongly connected to the provisions concerning cost recovery of the water services. The adequate (and proportional) contribution to the cost recovery of water services by each of the different categories of water users (disaggregated at least in industry, households and agriculture) in each MS is an important issue. A strict application of the principle (thus including environmental and resource costs) in combination with the polluter pays principle, would for example mean that the agricultural sector would have to pay for the extra costs imposed via diffuse pollution on the preparation of drinking water (and not the consumer of drinking water via higher prices). Currently, however, the principle seems mainly to serve the objective of achieving a sound (in this case meaning sufficient) financing of water management in Member States, instead of focusing on fair distribution of the financing burdens across sectors, taking pollution as a basis for financing.

Another important aspect of the cost-recovery principle is that it applies to water services and not to all water uses. As a consequence, the distinction between these two water-related activities is important. 'Water services' as defined in the WFD (see footnote) implies that all water 'use' within the system itself and the use of (goods and services provided by) aquatic

¹⁰⁷ Water services are defined in Article 2 of the WFD as 'all services that provide, for households, public institutions or any economic activity: (a) abstraction, impoundment, storage, treatment and distribution of surface water or groundwater, (b) waste-water collection and treatment facilities which subsequently discharge into surface water'. Water services as defined as such have an inclination towards meaning 'water management actions enabling human use of water'.

ecosystems are not included. Water use is defined in the WFD (Article 2, sub 39) as 'water services together with any other activity identified under Article 5 and Annex II¹⁰⁸ having significant impact on the status of water'. Water services are thus only part of the total of goods and services produced by the natural resources water and aquatic ecosystems. The definitions of the terms as provided in the WFD leave room for interpretation. Since the distinction is important for the recovery of costs, the WATECO (the WATER ECONOMICS working group installed by the European Commission) therefore clarified the definitions in its guidance document for the economic analysis (see for example WATECO, 2002). Nevertheless, since the guidance documents are legally non-binding, the interpretation of these concepts is still up to the MS.

Cost-effectiveness and economic efficiency

The principle of cost-effectiveness states that with regard to pollution through the discharge, emission or loss of (priority hazardous) substances, 'the European Parliament and the Council should agree on specific measures to be taken and identifying the cost-effective and proportionate level and combination of controls for both point and diffuse sources ...' (Article 16). ENGREF et al. (2003) state that although experience with the operationalisation of this principle is still limited, some general guiding statements can be made. One such statement is that the scale at which the principle of cost-effectiveness is implemented may be decisive for selecting cost-effective measures. This decision could also affect stakeholders, since a selection or change of scale determines/changes the stakeholders involved. This issue strongly relates to the matter of the distribution of costs. On a high level of scale, the macro-solution may be cost-effective, but the distribution of costs may disproportionately affect specific (groups of) stakeholders. The authors state that such stakeholders should at least be compensated for this disproportional financial burden or cost of damage. Not compensating would mean changing the property rights of the actors affected. A number of remarks can be made in this respect. Firstly, keeping in mind the externalities of economic activities in terms of environmental damage, it can be argued that these 'disproportional financial burdens' are actually not disproportional, but do reflect the damage these activities impose on the environment. Therefore, not compensating those negatively affected may be a deliberate political decision. Secondly, it is the question whether or not compensations can in every circumstance be regarded as a valid instrument to reach a consensus. Finally, it may be decisive how the consensus on the optimal solution, i.e. the optimal set of measures, is reached. An unequal distribution of bargaining power is likely to lead to sub-optimal solutions in terms of an equally shared burden. Therefore, a balanced negotiation process needs to be ensured by a strong river basin authority via formal institutions regarding the decision-making process.

Derogation in case of disproportionate costs

This principle states that in case MS have to make disproportionate costs to meet EU policy goals, these MS can, under certain conditions, be (temporarily) exempted from achieving these goals. The principle is closely linked to the principles of 'good ecological status', cost-effectiveness and economic efficiency (see above), BAT and BAT-NEEC (see further below)

¹⁰⁸ Article 5 addresses the characteristics of the river basin district, review of the environmental impact of human activities and economic analysis of water use. Annex II addresses the description of surface waters and groundwaters.

and the operationalisation of these principles into policy measures. The operationalisation of all these principles into policy measures may lead to situations in which specific MS or specific stakeholders are disproportionately hit by these measures. This situation may be caused by the physical, economic or institutional conditions in MS and are thus more or less external to the influence of water managers in these MS. Because of the exogeneous character of these factors, the EU may decide upon an adapted policy regime for that MS. Derogation may lead to a flawing of environmental or ecological standards on the basis of economic considerations.

Institutional principles

In addition to the 'good status' requirements, the WFD determines organisational objectives. It organises the planning and development of knowledge on the resource water at the scale of river basins with an objective of international co-operation. The administrative territorial unit retained for water management is the river district, which generally corresponds to the river basin or watershed. The institutional design of the WFD consists of three main components:

- An evidence-based policy principle;
- Public participation principle;
- A basin management authority.

As was discussed in chapter 3, integrated water management can be regarded as the balancing of the ecological, economic and social dimensions of sustainability in water management. Public participation addresses mainly the social aspect. Although very important, it was chosen in this thesis to focus on the balance between ecological and economic aspects of sustainability. Therefore, the public participation principle will not be discussed here.

Evidence based policy principles

The WFD sets principles of knowledge development, diffusion and justification that can be referred to as evidence-based policy. Evidence-based policy includes both data gathering and diffusion. It is developed in three stages: inventory of actual human use and initial status of the resource, formulation of measures and their implementation, and finally their outcomes and induced effects. The river basin management plans (RBMPs) are the central documents for information on objectives, measures, monitoring results, progress and updates. Evidence-based policy serves the goal of transparency and justification of public action. This principle of evidence based policy can be shared under the trend of rationalisation of policymaking. Since in the WFD, ecological goals and economic approaches play an important role, this is likely to include rationalisation of the management of ecosystems, including its economic aspects.

River basin management principle

The river basin management principle has its origins in the report of the International Law Association¹⁰⁹ about the use of the waters of international rivers. In the WFD, the basin is definitely assumed as the basic territorial scale for elaborating *River Basin Management Plans* and for organising integrated water management. According to ENGREF (2003: 76), this

¹⁰⁹ Report adopted at the 48th Conference of the International Law Association held in New York in 1958.

ensures coherence with the aims of sustainability and the conservation of aquatic ecosystems. The Basin is the territorial framework of the natural cycle of continental water. To respect this cycle, they argue, implies to assume a complex eco-systemic approach. Since the economic analysis of water use according to the WFD is also organised at the river basin level, this enables the tuning of economic activities in this basin with the (aquatic) ecological functions of water in the basin.

Relationships between the categories of principles

Generally speaking, it may be concluded that the ecological, environmental, economic and institutional principles as discussed above are in line with the starting points of integrated water management as discussed in chapter 3. However, this does not mean that no conflicting situations will rise in making all these principles operational. The nature of the interaction between the main categories of principles discussed above cannot be easily predicted. The ecological and environmental principles are not likely to conflict with each other. At first sight, the institutional principles take a neutral position relative to the other categories. As was indicated before, the focus in this thesis is on the balance between the ecological and environmental principles on the one hand and economic principles on the other¹¹⁰. With regard to the balancing of ecological and economic principles, many conflicting situations may be expected. As was mentioned before, ecological and environmental principles are in general risk avoiding in nature, while economic principles tend to be more risk seeking. Besides, high ecological and environmental standards may conflict with the economic principles of cost-effectiveness and derogation in case of disproportionate costs. In that case, the emphasis in the implementation of policy will depend on the balance between these potentially conflicting principles in the political arena. Compared to the former economic principles, the polluter pays principle and the full cost-recovery principle seem to be more 'ecological' in nature.

SUBSIDIARY POLICY PRINCIPLES RELATED TO EU WATER POLICY

In this part, policy principles are discussed that do not constitute the core of the policy principles of the WFD, but that are formulated in other policy frameworks at EU level and that (may) interact with (i.e. complement, obstruct or reinforce) the core principles of the WFD. Table 4.2 below lists these principles, according to the categories identified in literature. Only those principles considered relevant to the object of study are discussed. The table as a whole serves to illustrate that EU water policy may be influenced by other policy principles formulated at EU level. Since most of these principles were not formulated within the framework of environmental policy or within the framework of the WFD, it could be expected that they conflict more often with the central principles of the WFD than will these central principles amongst each other. The analysis of specific policy arrangements in Dutch water management will show that this conflicting situation mainly occurs with the competition principles. Other principles may be in line with or even reinforce the central principles of the WFD. A number of the principles listed in table 4.2 that are considered especially relevant for the case study chapters will be discussed more extensively in the text.

¹¹⁰ Nevertheless, some social issues related to the effects of principles of EU policy on water management, especially those regarding treating water as an economic good, will be discussed shortly further below.

Table 4.2: other categories of policy principles

Category	Principle	Explanation/comment
Basic principles of the European Treaty	Principle of non-discrimination	Both principles are general principles that address the access of and to all kinds of services
	Principle of free movement of persons	
General principles of good governance ¹¹¹	Principle of proportionality	Costs and efforts of policy measures (proposed by member states or EU) should be proportional to the issue addressed. This principle is in line with the principles of cost-effectiveness, economic efficiency and disproportional costs, but also relates to the criteria of equity and fairness.
	Subsidiarity	Also referred to as principle of decentralised action. See text.
Guiding principles in the construction of the European doctrine ¹¹²	Transparency	Information should be available to all stakeholders.
	Principle of proportionality	See above
	Consultation of consumers	Consumers are recognised as new stakeholders in water management, especially in relation to liberalisation and privatisation of formerly public services
	Subsidiarity	See above
Competition principles (see text)	Neutrality	Relates to ownership institutions in Member States.
	Prohibition of concerted practices, agreements and associations	Directed at practices, agreements and associations that may affect trade between Member States and prevent, restrict or distort competition within the common market
	Prohibition of abuse of a dominant position	In so far as it may affect trade between MS
	Supervision of aid	Directed at aid granted by the Member States, or through State resources in whatever form whatsoever, which threatens to distort competition by favouring certain undertakings or the production of certain goods;
	Preventive supervision of mergers	Directed at mergers with a European dimension, by approving or prohibiting the envisaged alliances;
Principles for preventive environmental measures ¹¹³	Liberalisation of certain sectors	Directed at sectors where public or private enterprises have hitherto evolved monopolistically;
	Critical load concept	Standards are based on the degree to which emissions and their deposition are acceptable to the environment without (significantly) disrupting ecosystems.
	BAT-NEEC	Best Available Technique Not Entailing Excess. Costs.
	Precautionary principle	See table and text earlier.
Principles steering standard setting	Non-degradation principle	Also referred to as stand-still principle. This principle implies that directives may not directly or indirectly lead to the deterioration of the environment. See table 4.1.
	Polluter pays principle	Forces those creating the pollution to pay the costs of meeting socially acceptable environmental quality standards. See table 4.1.
	Precautionary principle	See earlier for a definition
	Economic efficiency/cost effectiveness principle	In this context, these principles apply to both the setting of standards and the design of means (policy instruments) for attaining them. See also table 4.1 and earlier text.
	Subsidiarity principle	See above
	Legal efficiency (and flexibility) principle	This principle precludes the passage of regulations that cannot be realistically enforced

¹¹¹ See EU White Paper on the European Governance (COM (2001) 428 final)

¹¹² For a detailed discussion of these principles, see ENGREF et al. (2003:121)

¹¹³ These principles are guiding principles for preventive directives based on emission limit values.

(Source: adapted from ENGREF et al., 2003)

Competition principles

These principles are general principles for competition in the EU internal market. As such, they also apply to possible liberalisation of water provision and water management services. In some of the examples in chapters 5 and 6, it will be analysed how these principles influence application of economic policy instruments in Dutch water management.

General principles of good governance

Subsidiarity principle

This principle assigns environmental decisions and enforcement to the lowest level of government capable of handling them without significant residual externalities. The general aim of the subsidiarity principle is to guarantee a degree of autonomy for a lower authority in relation to a higher body or for a local authority in respect of a central authority. When applied in a Community context, this principle means that the Member States remain responsible for areas that they are capable of managing more effectively themselves, while the Community is given those powers that Member States cannot discharge satisfactorily. The principle is in line with the trend of deregulation, which refers to the general development at centralised governmental institutions of delegating tasks to both lower tiers of government and society and the market and leaving the operationalisation of policy to the discretion of these lower tiers of government. An example of the application of the subsidiarity principle in water management is when the WFD defines detailed objectives, but leaves the MS with the duty to set the mechanisms of implementation (policy programs and instruments) for reaching these objectives.

Impact of the various principles on MS water management

ENGREF et al. (2003: 148) state that the WFD introduces principles that have different scopes: for instance, the principle of cost recovery only applies to water services, while the principle of public participation applies to the water system on the whole, i.e. the decision mechanisms for water resources management. Kallis and Nijkamp (1999) conclude that governments that were previously accustomed to dealing with environmental issues in a 'closed' and discretionary manner, were obliged to report for their activities to a 'higher', european 'referee'. Only if drastic changes in administrative structures in the Member States would take place, would imposed standards be enforced in the way sought by the directives. As a consequence, all Member States, even those with more developed environmental protection structures, employed obscure clauses or imprecise definitions of standards to 'relax' the impact of the legislation, in order to avoid these drastic changes. An example is the adaptation of Dutch national policy to the EU Nitrate directive. The interaction between EU and Dutch national policy regarding nitrate emissions from agriculture will be further analysed in chapter 6.

Competition and private sector participation

ENGREF et al. (2003) state that the main pressure for competition and private sector participation comes from IMIs (International Monetary Institutions). This pressure is legitimised by two main principles, adopted at two major international conferences held in

1992: the International Conference on Water and the Environment (Dublin) and the United Nations Conference on Environment and Development (the 'Rio Conference'):

- *The instrument principle*: that water has an economic value in all its competing uses and should be recognised as an economic good. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resource¹¹⁴;
- *The institutional principle*: that water management should be based on a participatory approach involving users, planners and policymakers at all levels, with decision-making taken at the lowest appropriate level, according to the concept of subsidiarity.

According to ENGREF et al., the difficulty of pursuing an effective competition policy lies in the fact that the Community must continually juggle aims and principles that are sometimes contradictory. In the context of a liberalised water market, several issues are raised when considering the implementation of the polluter pays principle and the associated principle of cost-recovery. For example, the total recovery of the financial costs of water services by definition needs to include long-term investments and (other) long-term costs. ENGREF et al. (2003) argue that in a liberalised market setting with an increased number of private actors, stricter (less 'voluntary') safeguards will be needed to avoid short to middle term planning based on short-term costs. In their investment and pricing decisions, private actors will aim at maximising profits for their anticipated operation period. This operation period is likely not to coincide with the timeframe needed for ensuring long-term cost-recovery (including environmental and resource costs).

Comparing principles

Although the main goal of the WFD is a 'good ecological status', the directive serves several other (subsidiary) goals. As such, several policy principles apply to water management in MS as well. The policy principles addressed in this section are typically applied in conjunction with one or more of the other principles mentioned. Therefore, the effect of policy principles is characterised by the specific configuration of these principles. Combinations of principles may either reinforce or obstruct each other. The effect of combinations of principles mainly depends on the situation in which they are applied and the way they are operationalised. This contingency on the specific situation runs parallel to the contention of contingency in the analytical framework regarding the 'scope and content of economic policy instruments'. The same can be argued for the relative weight of each of the individual principles when combined with others (i.e. the priority order of these principles).

When analysing the subsidiary principles, one could argue that the following main categories can be distinguished: (a) general principles of good (democratic) governance (under which I share the first three categories in table 4.2), (b) principles for the market (competition principles), and (c) principles for taking environmental measures. When comparing the

¹¹⁴ It should be noted that this focus on efficiency bypasses the discussion of 'ability to pay'. This is a social issue related to treating water as an economic good that is often forgone in economic studies and policy about this issue. Whereas consumer behaviour in economic analysis is based on the concept of WTP (Willingness to pay), some consumers do not have the 'ability to pay' for water and water services. In this situation, these consumers do not have a choice about what to do with their financial resources and thus suffer absolute scarcity of financial resources. As such, economic approaches, that deal with situations of relative scarcity, are not applicable to and thus not suitable for these situations.

(categories of) principles it shows that a number of principles are mentioned in various categories. For example, the principles of proportionality and subsidiarity are both mentioned in categories (a) and (b). Again, it is not obvious on forehand how various (categories of) principles interact in water management. Some general principles of good governance may lead to a compromise with regard to one category of issues, such as the effectiveness of environmental measures, while stimulating effectiveness with regard to other issues, such as water quantity related issues. Besides, although compromising on the environmental dimension of sustainability, they may meet the requirements for the social and economic dimensions of sustainability. Examples of such principles are proportionality, neutrality and economic efficiency/cost-effectiveness. Because many of the principles can be operationalised in different ways, there is likely to be a strong interest in giving these principles the meaning various actors prefer. Therefore, there is also likely to be a strong discourse on the meaning of these principles.

When comparing the main and subsidiary principles of the WFD, it is apparent that a number of categories and principles themselves show overlap. The non-deterioration principle and the precautionary principle are mentioned as environmental/ecological principle both in the range of main principles and the subsidiary principles. The same counts for a number of economic principles. The polluter pays, the (full) cost recovery and economic efficiency/cost-effectiveness principles are all mentioned in the category of main economic principles and as one of the subsidiary principles for taking environmental measures. As was mentioned above, the main economic principle of proportionality is mentioned in several subsidiary categories as well. The main institutional principle of public participation is reflected in the subsidiary principles of 'transparency' and 'consultation of customers'.

When comparing the principles of the WFD with the legal principles of integrated water management as identified in chapter 1, it becomes clear that a large number of principles overlap. All principles mentioned in chapter one are also mentioned as principle of the WFD, with the exception of the risk principle, the compensation principle and the principle of uniformity of interest, payment and influence. The principles for integrated water management are predominantly ecological and environmental in nature. Ten out of thirteen principles can be claimed to belong to these categories. The other principles are the principle of uniformity of interest, payment and influence, the decentralisation principle and the subsidiarity principle. The first of these principles is the starting principle for financing management tasks of water boards, the other two principles are similar in meaning and address 'principles of good governance'. Argued the other way around, the other principles of the WFD (the ones not overlapping with the core principles of integrated water management) can be claimed not to be principles specifically directed at integrated water management. These principles mainly belong to the categories of 'good governance', 'economic principles' and 'competition principles'. The institutional principles for water management are not mentioned as principles for integrated water management either, but it can be assumed that these principles have been specifically introduced to facilitate this type of management.

Policy principles as operationalisations of policy paradigms

In chapter 3 it was argued that policy principles are an important step in the operationalisation of policy paradigms. The principles presented in this subsection relate to various policy paradigms. It can be argued that none of the principles presented relates to

the paradigm of 'frontier economics'. Whether or not some of the principles, especially ecological ones, fit in the paradigm of 'deep ecology' depends on their operationalisation. However, a radical interpretation is not very likely. As was discussed in chapter 3, the 'environmental protection'-paradigm has a defensive agenda, in which environmental protection shows as a cost instead of a benefit. It is only directed at limiting the direct negative effects of environmental degradation on the economy. The principles discussed above in general do not (clearly) fit in this paradigm. For some, again, their effect depends on their operationalisation. For example, the 'critical load concept' can be interpreted as a defensive principle. However, it can be argued that almost all of the principles presented aim at prevention of environmental damage and improvement of ecosystems, instead of mitigating the effects of pollution and exhaustion by end-of-pipe measures, as is the dominant approach in the environmental protection paradigm. It can thus be concluded that most of the principles of the WFD either belong to the 'resource management' or the 'eco-development'-paradigm. Generally speaking, principles belonging to these paradigms focus attention on the ecological dimension of sustainability.

The difference between these paradigms is one of emphasis, which was represented by the paraphrase that the approach in resource management is to 'economise ecology', whereas that in eco-development is to 'ecologise the economy' (Colby, 1990). Resource management is described as 'a fairly natural theoretical extension of neo-classical economics and a substantial change in practice. The basic idea is to incorporate all types of capital and resources' into the existing economic structure, thus only slightly modifying it. The approach is still anthropocentric at its core, by viewing eco-systems as resources for human activities. The relationship between economy and ecology is focussed on 'getting the prices right'. Characteristic principles for this paradigm are the principle of integration, correcting environmental damage at source, the polluter pays principle and the full cost-recovery principle (including environmental and resource costs). The paradigm of eco-development entails a larger, more discontinuous shift in thinking. It sets out to restructure the relationship between society and nature into a 'positive sum game'. It would attempt to move from 'polluter pays' to 'pollution prevention pays' by restructuring the economy according to ecological principles. According to this paradigm, applying the polluter pays principle does not lead to the desired state, since it does not incorporate ecological uncertainty and social equity issues well at all. The precautionary principle does, and therefore this principle fits this paradigm. Another goal of the paradigm is to integrate the ecological relationship between people and nature in communities, among communities sharing eco-regions, and among eco-regions cooperating to sustain the shared ecosphere of the planet (Tokar, 1988). Taking the river basin as a basic unit for water management may be an important step in this direction, since the river basin is not only a hydrological unit, but also an ecological unit, and can therefore be seen as an eco-region. Concepts that fit well in the eco-development paradigm are those that aim to base decision-making in society on ecological principles. Examples are eco-pragmatism and the eco-systems approach. These concepts were presented in chapter 1 as concepts for the operationalisation of integrated water management. Although not explicitly directed at such concepts, a number of the principles of the WFD could lead to the application of such concepts, such as the principles of ecological sustainability and integrated basin management.

A number of the principles discussed in this subsection are not ecological in nature. These principles mainly belong to the categories of 'principles of good governance', 'principles for competition' and 'economic principles'. Some of these principles may be expected to flout the ecological ambitions in the operationalisation of the WFD. The most important of these principles are the principle of proportionality, the principle of subsidiarity, the principle of cost-effectiveness/economic efficiency, derogation in case of disproportionate costs, the supervision of aid (in case governments want to support environmentally or ecologically benign activities) and the principle of legal efficiency.

4.3.3 ECONOMIC INSTRUMENTS FOR WATER POLICY AT THE LEVEL OF THE EU, ITS MEMBER STATES AND EEA-COUNTRIES

In the next subsections, an analysis will be presented of economic elements of policy (principles, goals, programmes, instruments and methods) proposed in a number of important policy documents related to Dutch water management. This analysis will start at the European level for reasons explained before (increasing influence on water policy of its member states). Again, the WFD will be taken as a starting point. Two reasons account for this choice. The first is the fact that it acts as an umbrella directive for other EU-directives related to water management, as was mentioned earlier in this chapter. The second reason is that the WFD is the first directive to explicitly include policy on the role of economic steering instruments, analysis and evaluation.

The subsequent levels of policymaking in Dutch water management are the national level, the provincial level, the municipal level and the level of water boards¹¹⁵. These levels will be discussed in the next subsection. The focus in these subsections is on economic steering instruments. However, in some situations, there may also be specific public policy regarding the use of tools for economic evaluation. For example, higher levels of public authority may include in their policy resolutions or laws guidelines as to how lower tiers of government should perform economic evaluations of public projects and other types of policy measures¹¹⁶.

In order to compare the extent to which economic policy elements are being incorporated into Dutch water management, this subsection also includes an overview of environmental levies applied in EU-member states and EEA-countries. Although this overview does not include all economic elements of policy as discussed in this subsection, it is expected to give some useful information in this respect. This overview will be presented after discussing the economic elements of the WFD.

¹¹⁵ It must be noted that this order does not always represent an order of decreasing public power. Especially water boards and municipalities often have equal power with regard to water management issues.

¹¹⁶ EU-guidelines for its member states in this respect have been mainly elaborated by WATECO.

ECONOMIC POLICY APPROACHES IN THE WATER FRAMEWORK DIRECTIVE (WFD)

After having discussed the primary and secondary policy principles of water policy at EU level, this section will discuss the economic elements of the WFD. This presentation will generate insight into the way economic steering instruments and evaluation methods are to contribute to achieving the policy goals as formulated at the EU (strategic) level. First, however, the general structure, priority order and emphasis of policy instruments and evaluation methods in the WFD will be presented shortly.

Main policy instruments and strategic approach of the WFD

According to ENGREF et al. (2003), the main instrument of the WFD is the programme of measures. A programme of measures is elaborated for each (national part of a) water district. The programme of measures integrates the requirements of national/regional and European legislation in a single document. It is composed of compulsory and complementary measures. The compulsory measures encompass the measures required by the European legislation regarding various aspects of water management. The complementary measures (or facultative measures) are left to the discretion of Member States. They are introduced in order to reach the objective of a 'good status' for all waters. It is stated in the WFD that market-based instruments belong to the category of facultative (thus complementary) measures. The emphasis with regard to economic aspects of water management in the WFD is on economic evaluation methods and cost-recovery of water services (in its narrow definition).

Economic elements of the directive

The general policy principles as discussed earlier are elaborated into more operational elements of the policymaking process, such as policy goals, programmes and instruments. The general policy goals of the WFD were already discussed earlier. Here, we will focus on the economic aspects of these policy programmes and instruments. First, a range of passages in the core text of the directive dealing with economic aspects of water management will be presented¹¹⁷. Then, these passages will be discussed with respect to the policy principles and goals they serve. This discussion gives an impression of the degree to and way in which the operationalisation of EU water policy through an economic approach to policy programmes, methods and instruments contributes to these principles and goals and to the overall goal of integrated water management. The operationalisation of these principles into preambles and articles of the directive can be regarded as an institutionalised interpretation of these principles. Since these interpretations, as part of the WFD, are legally binding, they will have consequences for water management in EU Member States.

The passages referring to an operationalisation of the principles and goals of the WFD via economic elements are:

¹¹⁷ I explicitly mention the core text, since these economic passages have been elaborated into guidelines by the WATECO working group. This working group provides guidance (documents) to the EU and EU Member States for the elaboration of the economic elements of the WFD into operational elements of water policy.

- Preamble 12, which states that 'pursuant to Article 174 of the European Treaty, in preparing its policy on the environment, the Community is to take account of [...] the potential benefits and costs of action or lack of action;
- Preamble 17, which recognises that 'protection of water status within river basins will provide economic benefits by contributing towards the protection of fish population, including coastal fish populations'. Although from the perspective of integrated water management it is a good thing that the economic benefits of the protection of water status are recognised, the range of benefits mentioned is very limited. A healthy fish population is unlikely to be the only benefit to society from the protection of water status within river basins. Economic or non-economic benefits resulting from a good water status can be generated by a whole range of other mechanisms, such as increased attractiveness for tourism, increased natural regulation or purification capacity, cheaper drinking water preparation from surface water, etcetera;
- Preamble 36, which recognises that 'it is necessary to undertake [...] economic analysis of water use';
- Preamble 38, which states: 'The use of economic instruments by Member States may be appropriate as part of a programme of measures. The principle of 'recovery of the costs of water services, including environmental and resource costs associated with damage or negative impact on the aquatic environment' should be taken into account in accordance with, in particular, the polluter-pays principle. An economic analysis of water services based on long-term forecasts of supply and demand for water in the river basin district will be necessary for this purpose';
- Preamble 43, which states with regard to pollution through the discharge, emission or loss of priority hazardous substances that 'The European parliament and the Council should [...] agree on [...] specific measures to be taken [...] and identifying the cost-effective and proportionate level and combination of controls'.
- Article 5, which deals with the 'characteristics of the river basin district, review of the environmental impact of human activity and economic analysis of water use';
- Article 9, which deals with the 'recovery of costs of water services'. It states that 'member states shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, having regard to the economic analysis conducted according to Annex III, and in accordance in particular with the polluter pays principle. Member States shall ensure by 2010 that water-pricing policies provide adequate incentives for users to use water resources efficiently, and thereby contribute to the environmental objectives of this Directive, an adequate contribution of the different water uses, disaggregated into at least industry, households and agriculture, to the recovery of costs of water services, based on the economic analysis conducted according to Annex III and taking account of the polluter pays principle. Member States may in so doing have regard to the social, environmental and economic effects of the recovery [...]';
- Article 16, which deals with strategies against pollution of water. In paragraph 6, with regard to priority substances, the Directive states that 'the Commission shall submit proposals of controls for the progressive reduction of discharges, emissions and losses [...] and [...] the cessation or phasing out of discharges, emissions and losses [...] In doing so, it shall identify the appropriate cost-effective and proportionate level and combination of product and process controls for both point and diffuse sources [...]';

Annex III, which lists the requirements for economic analysis. According to this annex, 'the economic analysis shall contain enough information in sufficient detail [...] in order to:

- make the relevant calculations necessary for taking into account under Article 9 the principle of recovery of the costs of water services, taking account of long-term forecasts of supply and demand for water in the river basin district and, where necessary: -estimates of the volume, prices and costs associated with water services, and -estimates of relevant investment including forecasts of such investments;
- make judgements about the most cost-effective combination of measures with respect to water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures.'

Annex II, which is an elaboration of Article 5 as it deals with the characterisation of water bodies, the identification of pressures and the assessment of impacts of these pressures on the water bodies.

Annex VI, which provides the lists of measures to be included within the programmes of measures required under Article 11. Part A of this annex lists existing European directives related to water, while part B gives a non-exclusive list of *supplementary measures* which Member States within each river basin district *may choose to adopt* as part of the programme of measures under Article 11. This list includes:

- Economic or fiscal instruments
- Demand management measures, inter alia, promotion of adapted agricultural production such as low water requiring crops in areas affected by drought, and;
- Efficiency and reuse measures, inter alia, promotion of water-efficient technologies in industry and water-saving irrigation techniques

In Annex VII, the requirements for the *contents of river basin management plans* are listed. These include:

- 'a summary of the economic analysis of water use as required by Article 5 and Annex III;
- a summary of the programme of measures adopted under Article 11;
- a report on the practical steps and measures taken to apply the principle of recovery of the costs of water use in accordance with Article 9;
- details of the supplementary measures identified as necessary in order to meet the environmental objectives established.

As can be seen from the overview presented above, the WFD contains several economic elements. Most of these elements relate to economic analysis as background studies to support policy measures leading to full cost recovery of water use and water services and cost-effective water management. In Article 9, water pricing policies are mentioned as serving two purposes, namely providing incentives for users to use water resources efficiently and recovering the costs of (public) water services. In Annex VI, a list of possible *supplementary measures* is provided. This list mentions the possible use of economic or fiscal steering instruments. From the balance between the different types of economic methods and instruments, the impression rises that the European Union first and foremost wants its member states to have their financial accounting system related to water management in order, so that no excessive financial or economic losses occur in its member

states, which the EU eventually may have to bear. The two main 'economic' principles relate to full cost recovery and cost-effectiveness. The European Union seems to want each member state (or rather, each river basin) to rise its own budget and to closely watch it, so that it does not become dependent on EU subsidies. With regard to the economic aspects of the WFD, economic steering instruments to protect and improve aquatic ecosystems appear as derived, second order goals. As such, the economic elements of the WFD are not specifically directed at improving the position of the quality of water in general and aquatic ecosystems in particular in public and private decision-making. Rather, this aspect is largely left to other, non-economic elements of the WFD, while the economic elements are to ensure that the attention for the ecological aspects of water management does not lead to financial problems in its member states. An exception to this analysis are the specific references to environmental and ecological (aspects of) policy principles, such as 'including environmental and resource costs associated with damage or negative impact on the aquatic environment' and the 'polluter pays principle', and an explicit (narrow) recognition of the benefits of healthy aquatic ecosystems.

ENVIRONMENTAL LEVIES IN EU-MEMBER STATES AND EEA-COUNTRIES

In the introduction to this chapter, it was argued that it would be useful to compare the number of environmental taxes and charges in various EU-member states and EEA-countries, in order to get an idea of the degree of application of market based instruments for environmental policy in the Netherlands compared to other countries. This comparison will be made here. The Community Fifth Environmental Action Programme (EU, 1993) and its 1996 review present the broadening of the range of environmental policy instruments as one of its key priorities. In December 1995 the European Council of Madrid concluded: 'In order to exploit the job-creation potential of environmental protection, these (environmental) policies should – to a greater extent than at present – rely on market based instruments, including fiscal ones'. The European Council of Florence of June 1996 sent a similar message. According to EU Communication 'COM (97) 9 final', which addresses environmental taxes and charges in the single EU market, the use of environmental taxes and charges is rapidly increasing in the Member States. The European Commission supports this evolution, as it 'opens up the scope for a more cost-effective environmental policy' (EU, COM (97) 9 final: 20). However, it also entails some potential conflicts with other aspects of Community Policy, in particular related to the single market. The Communication (COM (97) 9 final) also argues that there is considerable scope for action by the Member States to implement environmental taxes and charges¹¹⁸. As was discussed in theory, revenues from environmental levies can be used to finance environmental protection activities. Besides, they can be used to decrease other taxes which are perceived as distorting the economy, such as labour taxes. This shift in the taxation system from other taxes towards environmental taxes and charges is generally referred to as 'greening of the tax system'. Such an approach was proposed to the Member States in the Commission White paper 'Growth, Competitiveness, and Employment' (EU, 1993) endorsed by the European Council

¹¹⁸ According to the EU Communication 'COM (97) 9 final', the term 'taxes and charges' should be understood to cover all compulsory, unrequited payments, whether the revenue accrues directly to the Government budget or is destined for particular purposes (e.g. through earmarking). In the communication, the word *levy* is used to cover both taxes and charges as referred to in the text.

of Brussels in December 1993. This question was also dealt with in the Commission Report 'Taxation in the European Union, Report on the Development of Tax Systems' (EU, 1996), prepared for the European Council in Dublin, December 1996.

The appendix 1 of the Communication (COM(97) 9 final) shows a table of environment-related taxes and charges in EU and EEA¹¹⁹-countries as of October 1996 (see Annex III of this thesis). The table includes a number of taxes and charges that either directly or indirectly address goods and substances that may affect water systems. The table shows a great variety in application of environmental taxes and charges in the EU and EEA member states. A striking aspect is the difference in numbers of environmental taxes and charges between countries from different European regions. In 1996, most Scandinavian countries (Iceland, Norway, Sweden, Finland, Denmark) showed a large number of environmental tax and charge schemes, with the exception of Iceland. The total numbers of taxes and charges are 9, 22, 20, 19 and 22 respectively. In contrast to this, Mediterranean countries (Greece, Italy, Portugal and Spain) showed a relatively low number of environmental taxes and charges. The totals were 4, 7, 11 and 8 respectively. The numbers for Western-European and Central-European countries were usually somewhere in between these two groups. For the Western-European countries (Belgium, France, Germany, Ireland, Luxembourg, The Netherlands and the United Kingdom) the numbers were 12, 12, 12, 6, 3, 16 and 8 respectively. Luxembourg, the UK and Ireland showed a relatively low number of tax and charge schemes. The other countries in western Europe showed numbers somewhere halfway those of the Scandinavian and Mediterranean countries, with The Netherlands on the high end of this spectrum. For the Central European countries (Austria, Liechtenstein), the numbers were 10 and 11 respectively. Table 4.3 below gives an overview of environmental levies directly related to water systems. The remarkable aspects of this table are that The Netherlands are the only country to have implemented a tax on groundwater extraction and a charge on manure. However, contrary to a number of other countries, they have not installed a tax or charge on surface water extraction.

¹¹⁹ EEA stands for European Economic Area.

Table 4.3: Overview of water related environmental taxes and charges in EU and EEA countries, as of October 1996¹²⁰

Country	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Iceland	Ireland
Environmental Tax Measure									
Water Charges and Taxes									
Water charges			x	x	x	x			
Sewage charges			x	x		x		x	
Water effluent charges			x		x	x			
Tax on groundwater extraction									
Manure charges									

Table 4.3 (continued)

Country	Italy	Liechtenstein	Lu xembourg	NL	Norway	Portugal	Spain	Sweden	U.K.
Environmental Tax Measure									
Water Charges and Taxes									
Water charges		x			x			x	x
Sewage charges		x		x	x	x	x	x	x
Water effluent charges				x		x			
Tax on groundwater extraction				x					
Manure charges				x					

Source: OECD (Implementation Strategies for Environmental Taxes), 1996, updated, in: EU, COM (97) 9 final

Regulations regarding the use of environmental taxes and charges in Member States

Where appropriate, Community-wide rules and regulations have been adopted to enable environmental taxes to be applied at the EU-level and the level of EU-member states, within the framework of the single market. At the same time, in line with the principle of subsidiarity, an increasing number of national initiatives in the form of taxes and charges are being taken to deal with local environmental problems. In particular competition, single market and taxation policies, at both the EU and Member State level, affect the way environmental taxes and charges and the resulting revenues may be used. The legal

¹²⁰ The objective of this table is to give a schematic overview of the use of environmental taxes and charges in different countries. The design, structure, rates, and other specific characteristics differ from country to country. As a consequence, the score of the instruments listed in the table may differ substantially with regard to various selection criteria (such as effectiveness, efficiency and equity). It must be noted that it should not be concluded from the absence of environmental taxes or charges that a country does not have an adequate policy with regard to that specific water related aspect or issue.

framework basically aims to ensure that Member States do not distort competition by discriminating against products/services from other Member States. The assessment whether or not an environmental levy is necessary and proportionate to fulfil the objective of protecting the environment has to be made on a case-by-case basis. In practice, the assessment will often depend on factors such as the height at which the levy is fixed, the environmental gain expected by the measure and the amount of the administrative and other relevant costs connected with the regulated activity. The assessment of the necessity and proportionality of the measure may also depend on factors such as culture and consumer behaviour (EU, COM (97) 9 final).

In conclusion, the following can be said about the role of the EU in the application of economic steering instruments in Dutch water management. European environmental policy in general, and water policy in particular, has adopted a number of economic policy principles that facilitate the application of economic steering instruments in Member States for the purpose of protecting the environment. These are especially the 'polluter/user pays principle' and the 'principle of full cost recovery, including environmental and resource costs'. Besides, the implementation of taxes and charges for environmental protection is stimulated by EU policy. On the other hand, environmental taxes and charges are subject to regulations safeguarding a single European market. From the section above, it cannot be concluded definitely whether these European policies and regulations (will) have a significant impact on the decision-making about economic steering instruments and evaluation methods in Dutch water management. However, the text of the OECD-report of 1996 suggests that the number of taxes and charges in EU Member States and EEA countries substantially increased in the 1990s. Evaluation at various milestones in the implementation process of the Water Framework Directive will provide more insight in the way EU policy is translated into national policy and is being implemented in EU member states, river basins and river sub-basins. However, this evaluation falls outside the scope and timeframe of this thesis. Since the WFD and other EU-directives are binding, the impression is that the influence of these directives on MS water policy and management is substantial. However, the balance of the pressures mentioned above as yet remains inconclusive.

4.4 KEY ASPECTS OF DUTCH NATIONAL WATER POLICY

4.4.1 INTRODUCTION

The purpose of the overview of policy resolutions and approaches as will be presented in this subsection is to assess how wide-spread economic policy approaches are in Dutch water management. Besides, the overview intends to provide insight into the types of instruments applied and suggested, their characteristics (which determine their scope of action) and the issues and purposes they are applied to or suggested for (in other words, their scope of application in water management).

KEY PAPERS OF DUTCH WATER MANAGEMENT

When discussing the role of economic approaches in Dutch water management, it is important to know which policy is leading, or, in other words, for what purposes economic and other policy approaches are applied. This will be discussed here. In the Water management act (*Wet op de Waterhuishouding*) of 1989, it was laid down that the national government has to meet the obligation of writing down the national policy resolutions for water in a white paper on water management (*Nota waterhuishouding*), which should be revised every four years (*Wet op de Waterhuishouding*, 1989). At the time of writing this thesis, the most recent white paper was the Fourth white paper on water management (*Vierde Nota Waterhuishouding (NW4)*) (Ministerie van Verkeer en Waterstaat, 1998). This white paper up to date serves as the white paper for national water policy. It is meant to act as a guidance for policy and policy implementation at lower tiers of government (provinces, municipalities, water boards). The policy as formulated in this paper is therefore presumed in this thesis to be leading for public activities related to water management at national and lower public authority levels. The extent to which the paper is also leading for the interpretation of the concept of integrated water management and the application of economic elements in water management is subject of this study. Other levels of policy and other types of factors may have a large influence on this as well. Without doubt, however, the definition and interpretation of integrated water management and resolutions with regard to the application of economic instruments and methods at the national policy level will have effects on their operationalisation and application at lower policy levels.

Off course, *NW4* is not the only document shaping Dutch water management at the national level. Other formal and informal policy of the ministry of Transport, public works and water management (*Verkeer en Waterstaat; V&W*) and of other (water related) ministries influence water management at national and lower levels of public administration as well. Moreover, studies and recommendations of various permanent and temporary advisory committees and institutes also influence national water policy. Examples of such committees and institutes are the temporary committee for the study of the required water policy and management in the 21st century (*Commissie Tielrooy*) (see *Commissie Tielrooy*, 2000), the permanent committee for integrated water management (*Commissie Integraal Waterbeheer*) (see f.e. *Commissie Integraal Waterbeheer*, 1999) and advice issued by independent institutes such as the Rathenau Institute (Rathenau Instituut, 2000). With regard to some of these studies and recommendations, the cabinet explicitly and formally formulates her position. This is the case for example with the advisory reports composed by permanent or temporary advisory committees for water policy installed by the cabinet or the houses of parliament.

Elaborations and updates of water policy can both reinforce or alter the centre of gravity of water policy as formulated in *NW4*. With regard to the effects of the main temporary and permanent commissions, the latter can be claimed to be true. Whereas in the *NW4*, there is a lot of attention for water quality management, the studies of the temporary commissions, and thus the cabinet position papers reacting on the results of these studies, mainly related to water quantity management. This is clearly a consequence of the near river floods of 1993 and 1995, the local water nuisance in the Westland area (province of Zuid-Holland) in 1998, and the droughts in the first few summers of the new millenium. This political attention for water quantity management at the national level due to aforementioned events is clearly a

'shock event', referred to by Wiering and Immink as one of the impulses for change in policy arrangements. Chapters 5 and 6 will show that this shift in attention, in combination with other impulses, has had an impact on the types of arrangements proposed for water management.

For the provincial level, the formal (legally stipulated) water policy (laid down in law) is represented by the provincial plans for water management (*provinciale waterhuishoudingsplannen*), at the level of water boards by water management plans (*waterbeheerplannen*) and at municipal level by the water related elements of development (or 'zoning') plans (*bestemmingsplannen*). A number of the mentioned plans of the provincial, municipal and water board level was analysed with regard to economic elements. The results will be discussed in this chapter. Besides the official water management plans, the lower tiers of government also publish position papers and studies on water management, in anticipation of or reaction to higher level policy or developments in society. These position papers and studies are often performed by representative organisations of these tiers of government, such as the *UvW* (the union of water boards), *VNG* (union of Dutch municipalities) and *IPO* (the inter-provincial council). For examples of such studies and position papers, see Unie van Waterschappen (1999) and Leemhuis-Stout et al. (2000), respectively. Since they have no legal status, these studies and papers were not analysed as representations of formal water policy.

4.4.2 POLICY GOALS AND PRINCIPLES OF DUTCH WATER POLICY

As was argued above, before addressing the economic elements of Dutch water policy, it is good to know what is regarded as the central goal of Dutch water management and what are regarded at the national level as the main challenges in this policy domain. The same counts for the main second order or derived policy goals, since it was argued before that these second order goals may influence the choice of policy instruments for reaching the primary goals. The main general goals and challenges will be briefly addressed below. More specific policy goals, challenges and approaches will be addressed later in this chapter and in chapters 5 and 6.

CENTRAL GOAL AND LEGITIMISATION

The central goal of public water policy and management, as formulated in the fourth white paper (*NW4*), is 'having and keeping a safe and inhabitable country and maintaining and reinforcing healthy and resilient water systems, which guarantee a sustainable use' (Ministerie van Verkeer en Waterstaat, 1998: 11).

Importance of good water management for society

At the time of a sectoral approach, water management was mainly tuned to meeting the interests of a small number of economic sectors (agriculture, transport) and the protection of the economy and society as a whole from flooding (the safety aspect). In the concept of integrated water management as interpreted in *NW4*, the importance of healthy water systems is given a central position. 'Having and keeping healthy water systems' is indicated as the situation in which the aggregate interests of society as a whole are served best in the

long-term (Ministerie van Verkeer en Waterstaat, 1998). By this formulation, for the first time in the history of Dutch water management, other interests (recreational, landscape related, cultural-historical, environmental and nature-related and other sectors' interests) have been explicitly given a position equal to the vested ones (those interests served by sectoral water policy). Serving the *combined interests* of society as a whole and *for the long-term* are important elements of the integrated approach to water management, that according to present day insights were not given enough attention in the sectoral approach.

In *NW4*, investments in a good water management system are seen as a precondition for the development of a high-value industrialised society. For the sake of illustration, it was stated that the replacement value of the investments that are protected by the water defence system is estimated to be 4000 billion guilders (approx. 1.8 trillion Euros). The different qualities and functions of water and water systems (water as an axis for transport, resource for agriculture and industry, raw material for drinking water preparation, substance for cooling, for recreation and as an intrinsic landscape, nature and cultural-historical value) are regarded as being of great importance for the Dutch economy.

Addressing developments in society (challenges for Dutch water management)

Endogenous and exogenous developments, mentioned in *NW4*, that need to be anticipated by water management are the growing economy, a growing population, the desire to build in and on water and along the water edge, the construction of new infrastructure, growing (attention for) diffuse pollution and contamination of water floors, continued subsidence and a changing climate. According to *NW4*, this anticipation can be organised by including ecological and hydrological planning principles as a basis for spatial choices besides the more accepted ones (economic and social/societal). The developments mentioned here belong to various categories of impulses for change as identified in chapter 3.

DERIVED AND SECONDARY GOALS IN DUTCH WATER POLICY

Effective and efficient water management

In the discussion of integrated water management in chapter 3, it was already indicated that according to the *NW4*, the integrated water management-approach could contribute to more effective and efficient water management, by striving for both internal and external tuning and coherence. Effectiveness and efficiency are thus seen as important aspects of Dutch water management. Effectiveness refers to the degree to which (public) initiatives lead to the achievement of policy goals. Efficiency refers to achieving policy goals with the least (public and private) expenses possible. Both can in principle relate to a wide variety of goals. According to advocates of standard (i.e. (neo-) classical) economic theory, efficiency is an important positive characteristic of economic approaches to societal issues as compared to other approaches. This can also be argued for economic approaches to water management (i.e. increased market operation, an increased use of economic policy instruments and evaluation methods and/or increased emphasis on costs and benefits of water management). Therefore, from the combination of the two points of view above, it could be argued that integrated water management, not as a goal but as a means, and economic approaches to water management have effective and efficient water management as supposed common merits.

From this line of reasoning it could be concluded by advocates of standard economics that economic (policy) approaches would fit well in (integrated) water management and that such approaches would contribute to at least the goal of economic efficiency. However, as was stated in chapter 3, in the formal interpretation of integrated water management, efficiency itself is not regarded as a primary goal of integrated water management. Effectiveness could, depending on the type of goals to be achieved effectively. Besides, the fact that economic policy approaches and integrated water management have efficiency as supposed common merit does not automatically mean that there is consensus that the best way to make integrated water management operational is that of economic policy approaches. A third remark, related to the second, is that the merit of efficiency of economic policy approaches is advocated mainly by neo-classical economics, and not by other schools of economics, such as institutional economics (especially transaction costs economics) and ecological economics.

Roughly speaking, two types of discourses can be distinguished about the role of economic (policy) approaches in integrated water management. On the one hand, there is the discourse about the contribution of economic instruments and evaluation methods to achieving the primary goals of integrated water management (the desired state and function of water systems). This discourse could be referred to as the effectiveness discourse. On the other hand, there is the discourse about the way in which economic (policy) approaches in water management can contribute to efficient water management (in terms of the lowest possible financial burden from water management on society). This discourse could be referred to as the (economic) efficiency discourse. It can be expected that in debates about the contribution of economic approaches to water management, these two types of discourse will be intermingled. In the analysis of the discourses about economic approaches to water management in chapters 5 and 6, it will be analysed which goals are considered important by various actors (adhering different scientific disciplines or schools of economic thought), and what opinion these actors have about the role of economic policy approaches in reaching these goals. That way, the balance between the discourses mentioned above can be assessed, and thus whether one (and which) discourse is dominant.

PRINCIPLES OF NATIONAL WATER POLICY

The basic principles for integrated water management as formulated in *NW3* have been adopted by *NW4*. These principles are the stand-still principle, the precautionary principle, the polluter pays principle, the water systems approach and the integration principle. Besides these key principles, a number of other principles have been formulated to effectuate (specific aspects of) water policy. The open planning process, the river basin management principle, 'region specific policy' (*gebiedsgericht beleid*) and subsidiarity are mentioned as institutional principles. For region specific policy, besides economic and social planning principles, ecological and hydrological planning principles are attributed an important role. With regard to ecology, the self regulating capacities of aquatic ecosystems are considered important. Therefore, water systems should be as natural as possible. For this purpose, besides the already mentioned principles, the principles of mitigation/compensation and pollution prevention are mentioned. The ecological, environmental and institutional principles mentioned in *NW4* show large similarities with those of the WFD. With regard to the economic principles, only the polluter pays principle is explicitly mentioned. Therefore, it can

be argued that the *NW4* is less focused on economic aspects of water management than the WFD. The only economic principle mentioned is strongly related to environmental quality, and not focused on cost recovery.

4.4.3 ECONOMIC INSTITUTIONS IN DUTCH WATER MANAGEMENT

This subsection will explore institutions for Dutch water management that relate to economic aspects of water management and that are general in nature (i.e. apply to a wide range of issues in and aspects of water management). These institutions act as a framework of reference for the discussion of single issues and their related, issue specific institutions in chapters 5 and 6. The creation of different institutional arrangements for different issues in water management can be explained from a historical point of view. Since the beginning of Dutch water management, attention was paid mainly to the aspects of safety, land reclamation and transport. Therefore, the institutions addressing these aspects of water management are old and well developed. Compared to these aspects, attention for water quality is relatively recent. Subsequently, the institutions 'guiding' water quality management are relatively new and immature. A similar separate development of institutions counts for the issue of water and spatial planning. Since in the period of sectoral policy approaches, the policy domains of water management and spatial planning developed institutions separately, the institutions addressing the same policy issue from these different perspectives are unlikely to warrant an integrated approach and may even conflict. Besides, water management was initially organised to serve other land use functions. This interpretation of the role of water management in society can be referred to as 'water as a condition' for other land use functions. In the more recent integrated approach, more emphasis was laid on the value of healthy water systems and aquatic ecosystems themselves. Story lines that emphasise this value are referred to as 'water as a service' or 'water as a product'¹²¹.

Besides a sub-optimal tuning of institutions between policy sectors, the institutional arrangements within water management addressing different aspects of water management may also conflict or hamper an integrated approach, especially where water quality and quantity related issues meet (in integrated approaches). The combination of the development in recent years towards a more equal role for water management in spatial planning and a demand for integrated approaches calls for new, integrative institutions. This debate about the need for new institutions will be illustrated by the example of the debate about the need for a new financing structure later in this subsection. First, however, I will discuss the economic elements of white papers in Dutch water management.

ECONOMIC ELEMENTS IN WHITE PAPERS

For reasons discussed before, the overview of economic elements of Dutch water policy as discussed here is based on national white papers for water management. The presentation of economic elements here involves elements that are in principle applicable to (almost) any issue in water management, such as principles for the organisation and financing of water

¹²¹ For a more extensive discussion of these discourses, I refer to chapter 5.

management activities. Again, *NW4* is taken as a representation of formal national policy resolutions. Policy instruments for water management are discussed in chapter 6 of this white paper. In the introduction of that chapter, it is recognised that societal issues have become more complex, more dynamic and often larger in scale. According to the paper, 'environmental policy' (*omgevingsbeleid*, which refers to all policy addressing the spatial environment), of which water policy is considered part, does not escape the consequences of these developments. For that reason at the provincial level pilots were undertaken to get to (more) integrated planning via region-directed policy (*gebiedsgericht beleid*), which could act as an example for other levels of government. It is also stated that at the time of writing the paper, no initiatives were envisioned for drawing one integrated water law, which is seen by some as a precondition for taking integration a step further. Instead, it was chosen to reinforce the coherence between several water laws. However, it is acknowledged that developments in the financing of water management and European regulations may in the longer term require a further integration of national legislation.

The policy instruments suggested in chapter 6 of *NW4* are arranged according to the water management themes identified earlier in the paper¹²². With regard to diffuse pollution, research was done with regard to the possibility of raising a levy for different types of sources of diffuse pollution and on the possibilities for granting subsidies. The types of charges, taxes, levies and subsidies that were evaluated were a tax based on environmental criteria, regulating charges, a pollution charge and subsidies. The research on the possibilities for charges and subsidies focused on the three main causes of diffuse pollution: leaching of polluting substances from agricultural lands, the use of (roof) gutters made of zinc, and the use of anti-fouling containing copper on ships. According to the results of this research, possibilities for these instruments are limited. The pollution charge was considered 'legally inapplicable' (i.e., the right legal institutions are not available to easily and effectively implement this instrument). The regulative effect of the 'regulating charge' was considered limited or unachievable. Only with regard to leaching from agricultural land, the pollution charge (an emission levy, see chapter 3) was deemed applicable, albeit as a lump sum arrangement (meaning that the height of the charge is based on standardised emissions per hectare, and not on actual emissions). With regard to pesticides, herbicides and fungicides, it would be decided whether or not a pollution charge would be raised, depending on the progress made in existing policy. This also applies to the introduction of a tax on pesticides on which, as a consequence of the third white paper on water management, research is being carried out within the framework of a restructuring (greening) of the tax-system. Besides the research for charging diffuse sources of pollution, research was done on the possibilities for raising a charge (*WVO-heffing*) on toxicity (a product charge on toxic substances). This charge relates to point sources of pollution. At the time the *NW4* was written, the toxicity charge still had to be evaluated with regard to effectiveness. When positive, the Water pollution act (*WVO*) would be amended to make this charge possible.

The discussion above provides a short review of initiatives with regard to the use of economic policy instruments for issues in water systems management within the framework of *NW4*. Notwithstanding these initiatives, a number of economic policy instruments for environmental purposes are already in place in Dutch water management. These instruments

¹²² These themes are 'safety', 'dessication', 'emissions' and 'water floors'.

were already addressed briefly in the comparison of environmental levies in EU- and EEA-countries earlier this chapter. Some of these instruments will be discussed more extensively in chapters 5 and 6. Economic policy instruments may play various roles in water management. Some instruments may be in place primarily for the financing of water management tasks, while other instruments were implemented primarily for the purpose of influencing the behaviour of economic actors. In order to understand the role and scope of various economic policy instruments in Dutch water management, it is necessary to know the basic principles and structure of its financing system. Discussing the financing structure of Dutch water management is expected to provide insight in the relative contribution of true steering instruments to the financing of the total of water management tasks. Besides, the discussion of the principles that lie at the basis of this financing structure is expected to contribute to an assessment of the degree to which economic policy instruments in Dutch water management contribute to an integrated approach. The financing structure of Dutch water management is discussed below. The discussion addresses policy elements resulting from formal institutions for water management (such as laws and white papers) at the national level. Initiatives for the study or implementation of economic policy instruments are also taken in other contexts than the financing structure and at other (lower) policy levels. Such initiatives will be addressed in chapters 5 and 6.

THE FINANCING STRUCTURE OF DUTCH WATER MANAGEMENT

Introduction

The reason for discussing the financing structure of Dutch water management is that the way tasks in Dutch water management are financed may have a strong influence on the degree to which economic steering instruments, which may be used for the purpose of generating financial resources, meet the preconditions of integrated water management. Tasks in Dutch water management, and the related financing system for these tasks, have developed relatively autonomously throughout history. The types of tasks and the historically grown division of tasks among water managers have been leading for the way these tasks were financed in the past, and to some extent still are leading today. In 1992, a commission installed by the Ministry of V&W to investigate the financing structure of Dutch water management¹²³, concluded that the introduction and implementation of the concept of integrated water management as such does not influence the allocation of tasks among water managers and the financing of these tasks. Another conclusion, however, was that it does have effects on the way water management tasks are performed. In 1999, another task force was installed (by UvW, the union of water boards) to study the financing structure of (especially regional) water management (*Commissie Togtema*). The assignment and results of this commission will be discussed later in this subsection. The results of this research has some important implications for the financing structure of water management from the perspective of integrated water management. First, however, I will turn to a discussion of the basic principles of the financing structure.

¹²³ Commissie Onderzoek Financiering Waterbeheer (cie-oFW), also referred to as Commissie Zevenbergen, after its chairman.

The financing structure as discussed here concerns the financing of water management tasks by the main public organisations for water systems management in The Netherlands: the central government, provinces and water boards¹²⁴. In this discussion, no distinction is made on forehand between the financing of management tasks for water systems quantity and for water systems quality management.

Two main principles

Since the earliest forms of centralised water management (in the Middle Ages), the water management tasks to be performed formed the starting point of the financing of Dutch water management. The water management tasks performed and the financing of these tasks are, so to speak, demand-driven and directly related to each other. Since about a thousand years the 'benefit-principle' has been central to the financing of Dutch water management. Together with the desire to have some sort of democratic decision-making in water management, this principle led to the triptych 'interest, payment, influence' as the central principle for both the financing of local and regional water defense structures and water quantity management and for the representation of interests. This triptych can be explained as follows: the stronger the interest of a stakeholder (for example the owner or tenant of real estate or land) in specific local and regional water management activities, the more that stakeholder has to contribute to the costs, and the more influence he has in the decision-making about this water management.

As was mentioned before, water quality management emerged in a much later stage, roughly in the 1960s. At first, there were no clear and powerful institutions for the financing of this aspect of water management. However, in 1970, the Surface Water Pollution Act was issued. This act, that enabled the fight against point sources of pollution, was based on the polluter pays principle. This principle is the leading principle for (the financing of) all Dutch water quality management. The two principles mentioned above were and still are the starting points of water management on a local and regional level. In the 18th century, the need for a representative organisation for supra-regional tasks was felt, such as the formulation of general guidelines for water management and regulation of the discharge of water and ice by the major rivers. This led to the installation of the national organisation for water management, *Rijkswaterstaat*, in 1798. The costs of the tasks performed by this organisation could not be allocated to separate regions and could not be (easily) recovered from the polluter, and therefore, the principles mentioned above did not apply. The tasks performed by this organisation were therefore financed by general means.

As was discussed earlier this chapter, the polluter pays principle is one of the central policy principles of the WFD. It was concluded there that this principle contributes to integrated water management via the incorporation of the effects of human activities on the environment in public and private decision-making. Therefore, this conclusion also holds for the main financing principle for Dutch water quality management. The degree to which it

¹²⁴ Note that municipalities also have specific responsibilities (tasks) in water management. The only legal task relates to the proper collection and transport of waste water (i.e. to the water chain). In recent years, water management tasks by municipalities have expanded considerably, beyond the specific aspect of the water chain mentioned above. So far, however, no laws have been issued for the financing of these tasks. This law is expected to be issued in 2007.

contributes to integrated water management depends on the paradigmatic perspective from which this principle is applied. In other words, it depends on whether the PPP is based on the paradigm of strong or weak sustainability. Whether the principle of 'interest, payment, influence' also contributes to integrated water management, depends first and foremost on the way the principle is operationalised. In former, sectoral water management, one could not speak of integrated water management, since only a limited number of interests was taken into account in water management decisions. These interests (stakeholders) paid substantial amounts for specific water management tasks, and as a consequence were given a strong voice in decision-making by water boards. In present day water management, expansion of the notion of 'interest' towards other categories of actors, such as owners of real estate (both citizens and institutions) and citizens enjoying nature has led to a re-balancing of water management tasks, and thus to a rebalancing of the contribution to the financing of regional water management. According to the principle of interest, payment, influence, this also led to a re-balancing of influence among categories of actors represented in the general assemblee of water boards. The same effect was established for water quality management by a strict application of the polluter pays principle. This resulted in increasing contributions of households and industry to the financing of water quality management tasks, and thus to an increase in influence in the general assemblee of water boards. In water quality management, one could therefore speak of the application of some sort of 'interest, payment, influence'-principle as well. In recent years, via both principles, a shift has thus taken place from the representation of specific to general interests in both water quantity and quality management.

In water systems quality management, another shift has taken place, namely that from 'interest' to 'cost-cause'. Therefore, nowadays, one could speak of the principle of 'cost-cause, payment, influence' instead. This focus on the causer of costs is in line with the principles 'polluter/user pays principle', 'full-cost recovery including environmental and resource costs' and 'rectifying environmental damage at source' as formulated in the WFD. For water systems quantity management, the relation between cost-cause and payment is less direct. There, height of the contribution is based on the value of the protected capital or on the contribution of water management to the value added in production processes. The relationship between 'cost-cause' and payment is less direct because actors with an interest do not actively cause the costs for water management, but passively do so via their (implicit or explicit) demands for water quantity management.

Priority order for financing of water management tasks

For the financing of water management, the priority order of public funding is leading. According to Van Ast (1989: 147), the priority order is the following:

1. Financing through the price mechanism;
2. Financing through fees/retributions;
3. Financing according to an earmarked levy (*bestemmingsheffing*);
4. Financing from the general funds (*algemene middelen*).

Huisman (2002: 3) makes a somewhat different categorisation. According to this author, interest parties (benefit principle) or sources of harmful activities (polluter pays principle) get the first priority to finance the costs (represented by categories 1, 2 and 3 by Van Ast). Common provisions (measures, projects or services for the general public) get the second

priority (represented by category 4 by Van Ast). Costs of exceptional activities define the third and lowest financing priority. These costs are usually paid for through the general budget (also category 4 in the priority order of Van Ast). The categorisations of Van Ast and Huisman differ mainly with regard to the first category mentioned by Van Ast, namely the financing of water management tasks through the price mechanism (i.e. via the market) as the highest priority in financing water management. This category misses in the categorisation by Huisman.

The priority order presented in the third white paper on water management (*NW3*) (Ministerie van Verkeer en Waterstaat, 1989) is similar to that of Huisman:

- a) If possible, the costs are recovered directly from the cost-causer or the one benefiting from the measure (the polluter/user/benefiter pays) (cat. 2 by Van Ast);
- b) If the government provides for public facilities and individual recovery of costs is not possible, the costs are recovered via general charges (cat. 3 by Van Ast);
- c) If financing cannot be achieved via the mechanisms 1 or 2, financing takes place from general means (taxes) (cat. 4 by Van Ast).

The categories in the priority order as maintained in the *NW3* and by Huisman are addressed in more detail below. The financing of tasks via the market (category 1 by Van Ast) is a different mechanism, which does not generate financial resources for public water management tasks. This category will not be addressed separately here. The major difference between financing via the market and financing via fees, retributions, charges and taxes is that in the latter case one usually cannot speak of a voluntary transaction, since in most cases, the 'demanding party' cannot choose whether or not he/she wants to purchase the good or service provided. However, there is a gliding scale in the freedom of choice in the ladder presented. With regard to fees and retributions, in some situations consumers may have a choice whether or not to purchase the good or service, while they do not have this choice in case of financing from general means. Therefore, viewed from a liberalist perspective ('freedom of choice'), the priority order as presented above also means an order of desirability, with the desirability decreasing while going down the ladder.

Ad a: financing by direct recovery from stakeholders

Public water managers have the aim to create the water-related conditions required for the functions that have been assigned in water management plans to ground and surface water in a specific area. Measures that go beyond those necessary for properly serving general functions will have to be paid by the stakeholder that has an interest in these extra measures. To these situations, the benefit-principle applies. The costs for measures aimed at water treatment and other measures to prevent or mitigate the pollution of water systems will be carried by individual or groups of dischargers (polluters). To these situations, the polluter pays principle applies. Some measures can be recovered via the 'cost-causer pays'-principle. For example, for the reduction of the effects of ground water extraction, prescriptions can be included in the permit that require compensatory measures, such as infiltration. The costs for these compensatory measures, the recovery of damage in case no compensatory measures can be taken, and the costs for research regarding alternatives for ground water extraction can in principle be recovered from the extractor(s).

Ad b: financing through apportionments and levies

Measures water managers can take on the basis of a specific task assigned to them (for example based on a law or regulation), reside under collective facilities. Characteristic for these facilities is that it is impossible or ineffective to take individual measures to meet the demands. Examples of tasks in this category are the construction, improvement and maintenance of the water related infrastructure, general water quantity management for regional or local water systems, water level management, general water quality management for regional or local systems, transport and treatment of waste water, and quantitative ground water management. These tasks are financed via apportionments and levies that are (usually) general and lump sum in nature. The reason that these activities can be financed via apportionments and levies is that they are restricted to specific geographical areas and/or types of users or beneficiaries. Therefore, these measures benefit a restricted and identifiable group of actors.

Ad c: financing from general means

Costs of measures that cannot be easily (and legitimately) allocated to specific regions and cannot be recovered from a cost-causer, but that are nevertheless considered of importance for Dutch society, are financed from general means. Examples are the costs of formulating water policy, the tuning of water policy to other public tasks, international platforms for water management and water management tasks by the central government serving general interests, such as water management of the primary water system, including the management of the flood defense system and the purification of heavily contaminated water soils if the polluter cannot be traced. Besides, general means can be used for financing specific purposes or projects, such as improving the regional water management system in order to reduce desiccation.

The description of the categories above makes clear in what way various public water management activities are financed under normal circumstances (when the situation is clear). It showed that the financing of water management task is linked as directly as possible to the cost-causer. Besides, it was explained which principles apply to these situations. However, 'situations' are not always clear, and in these cases, it is not always obvious what the priority order of the financing principles is. This question is relevant because in some situations, financing principles may conflict. For example, a farmer may pay a fee to a water board to maintain a certain surface or ground water level, which enables him to produce crops on his land. The fee is then paid according to the benefit-principle (*profijtbeginself*). However, this specific water level may lead to desiccation of a nearby nature area. The question then is whether or not the farmer is held liable for the damage to the nature area and is made to pay for it according to the cost-causer principle. This question may be answered in an indirect way by looking at the dominant policy for that area. For example, the question who is responsible for damage to the nature area due to desiccation may be answered by considering the designated land use function and function of the water system. These functions have been laid down in (democratically legitimised) spatial plans and water plans. However, policy plans issued by various policy domains may be contradictory and basing decisions on this policy may be arbitrary and may be objected to by opponents.

Bottlenecks in the financing resulting from developments in governance

As a consequence of a number of developments in society and governance, discussions have emerged about the question whether or not the financing system as discussed above can meet present-day requirements for water management. For example, the increasing integration of various policy sectors raises questions about the optimal financing structure for and allocation of public financial means. Besides, water quality and quantity management become increasingly interwoven. In some situations, the same types of measures are taken, although (perhaps) from different perspectives. For some issues in water management, solutions can be found in (a combination of) various aspects of water management. For example, desiccation can often be addressed by taking measures in both surface water quantity management and ground water quantity management. In some situations, (public or private) organisations from outside the water management sector carry responsibility, and therefore, investments in water management may be expected from these organisations.

An increasingly problematic bottleneck in water quality management is the financing of measures to address (prevent or mitigate) diffuse pollution. The costs for these measures are increasing rapidly, but proper financing mechanisms for these measures do not exist. An important reason for this is the fact that the cause-effect relationship (and thus the cost-cause) for diffuse pollution most of the times is indirect and disputable. Therefore, it is difficult, if not impossible, to apply the polluter pays principle to this type of pollution. Besides, charges for substances or activities causing diffuse pollution are often harder to implement or less efficient than for point sources of pollution due to high perception costs¹²⁵, the lacking of a monitoring organisation, and high costs for monitoring and enforcement. In short, charges for diffuse sources of pollution are often encountered with substantial practical problems. As was shown in the discussion of economic instruments in EU-member states and EEA-countries, a number of economic instruments for diffuse pollution have been implemented. However, the revenues of most of these levies accrue to the general budget, since they are taxes and not charges. Therefore, they do not directly finance water related measures for diffuse pollution. As such, these instruments cannot be regarded as structural mechanisms to finance water management tasks. A number of direct water related charges do, but these mainly address point sources of pollution.

The text above only shortly addressed some developments in the discussion about the financing structure of Dutch water management. From this presentation, although short, it became clear that developments in water management, especially those towards integrated or even interactive water management, result in bottlenecks in the financing structure of water management tasks. This discussion about the financing structure can be regarded as part of a larger discussion about the organisation of water management in The Netherlands. The issue of the reorganisation of the financing structure is addressed more extensively below to serve as an example of the debate being held in this respect.

¹²⁵ Perception costs are interpreted by Havekes (2004: 55) as 'the costs that need to be made to collect taxes or charges'

Reorganisation of the financing structure?

Both questions about the management practice of water management and the principles for financing have created the need for evaluating the present financing structure of water management, felt at various government levels and in the private domain. The question raised in the *NW4* is whether this structure needs changes to make a good implementation of the policy presented in the *NW4* (i.e. that of integrated and sustainable water management, the water systems approach, eco-pragmatism, *et cetera*) possible (Ministerie van Verkeer en Waterstaat, 1998: 105). The financing structure of water management is an issue at all levels of water policy and management. However, so far, most of the attention has gone to the financing of the tasks of water boards. Reasons for this focus on water boards are the changes to which these organisations are subjected: the expansion of their tasks as a consequence of all kinds of societal and physical developments, the reorganisation into larger management units as a consequence of this expansion, and the vision to organise water management at river(sub-)basin level. At the turn of the millenium, the Union of water boards (*Unie van Waterschappen*) installed a commission¹²⁶ for the evaluation of the financing structure of tasks performed by water boards (Unie van Waterschappen, 1999). The assignment given to the commission by the union was to investigate to what extent it would be possible to achieve a transparent financing structure for these tasks within the conditions set by the union. One of the preconditions set by the union was that also in the future water boards would be able to finance their own management tasks via their own financing mechanisms (in other words: to remain financially self-supporting) and that the taxes would remain based on the principle of '*belang, betaling en zeggenschap*' (interest, payment, influence) and the polluter pays principle.

The main results of the study of Commissie Togtema (Unie van Waterschappen, 1999) were:

- starting point for adapting the financing system is a *regrouping* of the present *tasks* of water boards into waste water management and water systems management. According to the commission, by making this distinction, a more direct relationship between task, cost-component and levy or charge would be created;
- owners of real estate (which are recognised as a specific group of stakeholders) are acknowledged as having specific stakes in water systems management (protection of their property from water damage through water level control and flood protection). The suggestion is made to base the levy for these activities on surface area. With this suggestion, the commission abandons the value of the real estate property as the basis for the charge.

A few comments can be made on these results from the perspective of integrated water management and economic policy approaches to water management. Firstly (and related to the first conclusion), the explicit recognition of 'water systems management' as a task and therefore as a budget item is likely to facilitate financing mechanisms for general management activities that fall within this range of tasks (i.e. activities for which the costs cannot easily be recovered from the cost-causer). The creation of these financing mechanisms requires a legal basis. The question whether or not this basis is present was not part of this thesis. Opponents of this restructuring argue that water chain and water systems management are inextricably interlinked, and therefore argue that this distinction between

¹²⁶ *Commissie Onderzoek Financiering*, also known as the *Commissie Togtema*, named after its chairman.

water chain and water system is undesirable. Besides, this distinction may lead to legitimisation of mitigating measures for the water system financed from a general budget, while priority should be with preventative measures financed by specific levies based on the cost-causer or benefit principle. Secondly (and related to the second conclusion), basing the contribution of groups of economic actors to the financing of water quantity management on surface area instead of real estate value runs counter to the principle of 'interest, payment, influence', since the most direct interest in water quantity management is the protection of property. From an economic perspective, the best basis for the height of the levy would be the value of the protected property. Besides the protection of property, another interest (especially for farmers) is the setting of the right conditions for production. The height of this interest would also be better represented by the value added via production than via the area of land. According to the market mechanism, the price of land is determined by the value of the activity (or activities) undertaken on this land. Therefore, the market price of the property might be a good basis for the contribution of the owner of this property to the financing of water systems quantity management. On the other hand, this mechanism would probably create a disbalance between land use activities that have a vested position in the market (i.e. an acknowledged added value in monetary terms, such as agriculture or construction) and those that do not (such as nature), as long as the value of the latter activities is not properly represented in economic decision-making processes.

The Rathenau Instituut¹²⁷ wrote a reaction on the report by the Commission Togtema (Rathenau Instituut, 2000). According to the report, many stakeholders expressed their appreciation for the results of the study by the Commissie Togtema. They pointed out the importance of transparency in the water management financing structure and stressed the positive influence of the suggestions made by the Commission in this respect. However, the Rathenau Instituut itself observed a contradiction in the results, arguing that a transparent financing structure is nearly impossible as long as the principle of 'stake, payment, influence' (*'belang, betaling, zeggenschap'*) is maintained as a leading principle. The Rathenau Instituut argues that, in line with the concept of integrated water management, good water management is in everyone's interest. Therefore, it is not suitable anymore to give a specific economic interest (such as agriculture or transport) more than (democratically) proportional influence by means of a specific payment structure (Rathenau Instituut, 2000: 87). From this argument, it shows that Rathenau Instituut holds the opinion that payment for specific water management tasks should not be the basis of the structure of representation in water boards. So on the one hand, many agree that the 'cost-causer pays-principle' (which encompasses both the 'user pays principle' and the 'polluter pays principle') is an important principle in the financing structure of water management. On the other hand however, the Rathenau Institute (and possibly others) holds the opinion that the relative contributions of various stakeholder groups (categories in the financing structure) to the financing of water management tasks, based on these principles, should not be translated in a proportional influence in the decision-making structure of public water management organisations.

¹²⁷ The Rathenau Instituut is a research institute giving (asked for and unasked for) advice to the Dutch parliament. It was established as an independent research institute in 1986 by the minister of Education and Science. The goal of the institute is to contribute to the societal debate and the formation of political judgement about scientific and technological developments. In a managerial sense, it is part of the Royal Dutch Academy of Science (*Koninklijke Nederlandse Academie voor Wetenschappen, KNAW*).

Rather, it should be based on democratic representation comparable to that in other democratic public structures, such as the national, provincial and municipal governments. The fact that the division of seats in the general assembly is based on the contribution to the budget of the water board by various categories of stakeholders is the main factor distinguishing the functional democracy of water boards from the common representational democracy of other public organisations.

Notwithstanding the above, in recent years, some developments towards a more democratic structure have already taken place in water boards. Although the division of seats between various categories of stakeholders in the general board of the water board is still based on the amount of revenues generated from each of these categories, the more transparent and direct link between payment and influence has led to the inclusion of a number of new categories of stakeholders of water management. The increased relative payment of these new categories has in turn led to a more balanced division of influence between these categories. As a consequence, roughly speaking, the power balance between stakeholders in the general assembly of water boards has shifted from economic interests of producers (such as farmers and water transport) to the interests of consumers (citizens, house owners, inhabitants).

In 2002, the cabinet decided to start their own investigation with regard to the financing structure of (especially regional) water management. This investigation was part of a range of investigations called *IBO's* (*Interdepartementale BeleidsOnderzoeken*; Interdepartmental Policy Investigations). A considerable number of ministries and other public organisations (such as *IPO* (the representative organisation of the provinces), *VNG* (the representative organisation of the municipalities) and the *UvW* (the representative organisation of water boards) participated in this investigation. The reason for the investigation was that the introduction of integrated water management as official policy leads to a vast number of changes in water management. These changes lie in the role of the traditional water managers, the expansion of their tasks, the entrance of other actors in water policy and management and other approaches to water management issues. According to the Minister of Finance, the measures envisioned by the Commission for water policy in the 21st century (*Commissie Tielrooy*) and the introduction of the European Water Framework Directive contribute to the urgency of reconsidering the financing structure. The goal of the research was to study possibilities for greater simplicity, effectiveness and cost-effectiveness in water management. The official research question was: 'How can integrated water management best be financed?'

For the purpose of answering this question, the task force (Task force 'Meijerink') formulated and studied four alternatives for the organisation and financing structure of regional water management. These alternatives ranged from an alternative that is very close to the present structure to one that would to a great extent limit the financial autonomy of water boards and would substantially enhance the control of the central government on the activities of these water boards. After studying the alternatives, the task force was not able to formulate an unanimous position. The cabinet, however, did take a clear position with regard to the alternatives studied. It chose for the alternative that stayed closest to the present organisational and financing structure of regional water management. The cabinet's argument was that the situation in which the regional water management organisations were

authorised to generate their own finances (as has always been the case for water boards in The Netherlands) would enable these organisations to perform the required tasks (the *wateropgave*, i.e. the total of measures needed to provide for a well functioning water management system) in an effective way. Besides, according to this position, the regionally operating water boards know best what measures are needed to reach the policy goals stated, and thus to provide for such a well functioning water system.

From the developments as presented above, it can be concluded that in the near future, no major changes will occur in the organisation and financing structure of regional water systems management. The strategy of the primary actors in water management (ranging from central to local public water management organisations) is to achieve the goals formulated according to integrated water policy within the framework of the present organisational structure (institutional framework), with the exception of a number of minor changes of and within this structure.

Policy principles for the financing of an expanded set of water management tasks

As showed from the discussion of the mechanisms for the financing of Dutch water management tasks in the beginning of this section, the general expectation is that the costs that have to be made for water management will increase as a result of the broadening of tasks in present day integrated water management as compared to sectoral water management. According to the *NW4*, concerted efforts are needed for 'developing and maintaining a safe and liveable country and for healthy and resilient water systems'. In this respect, the *NW4* builds on policies as initiated in *NW3*. These policies in the first place led to an intensification of measures aimed at restoration of water systems and at stimulating a structuring of the management of water systems that would be better attuned to their different functions and in which ecological functioning could be given more attention.

What becomes clear from *NW4* is that the increased budget necessary for proper integrated water management will be mainly financed by a strict application of the principles of full cost recovery and the polluter/user pays. This is in line with EU-policy, which mentions the principle of full cost recovery (including costs of impacts on nature and the environment) as one of the main principles. If the requirement of the incorporation of the costs of impacts of economic activities on nature and natural resources is met, the full cost recovery principle *de facto* encompasses both the polluter pays and user pays principles. The strict application of these principles may become problematic in some cases, in which it is not easy to determine who is the polluter/user and who should (thus) pay. Besides, in cases in which it is clear who is the polluter/user, target groups may not regard themselves to be 'problem owners' and may resist to being subjected to these principles. The issue of problem ownership is thus closely related to the distribution of property rights. An example may clarify this relationship: an economic sector may use a certain production process that maximises profit within the existing institutional structure. At a certain moment, it may be discovered that this method of production causes substantial negative externalities in the shape of environmental degradation. Government authorities may formulate specific environmental policy to abate the negative externalities of the production process. However, the 'old' institutional structure has led to a situation in which the producers have appropriated a certain historical right to pollute (which is an informal institution). The producers may (and often will) use this

historically grown right to pollute¹²⁸ as an argument to oppose to new environmental regulations. This right to pollute may thus be an important resource in the discourse regarding water management issues. In order to be able to strictly apply the principle of full cost recovery (including environmental and resource costs), it is thus necessary to have a clear demarcation of property rights regarding water, both with regard to the use of water itself and to the use of aquatic ecosystems for their capacity to absorb pollution and for other goods and services they provide.

General policy principles and financing principles for water management are part of the formal institutional framework. In the discussion above, conflicts between financing principles were highlighted. However, similar conflicts may exist between financing principles at various management levels, between financing principles and other policy principles, and between general and financing principles and other formal and informal institutions. These types of conflicts will not be discussed in a general manner here, since this discussion could easily become overly hypothetical. Instead, they will be addressed in case they emerge from the discussion of specific issues in water management in chapters 5 and 6.

Deregulation, market operation and legislative quality in water management

As was discussed before, at the national level, an operation was started in the 1990s named the *MDW-operation* (*Markwerking, Deregulering en Wetgevingskwaliteit* (market-mechanism, deregulation and legislative quality)). The tactical goal of this operation is the removal of regulations limiting competition, the reduction of regulations, the improvement of administrative efficiency, and improvement of legislative quality. The fundamental goal of this operation is to limit the scope of products and services provided by public organisations in favour of private organisations via the market mechanism. Discussion of this operation is important with regard to the application of economic steering instruments in water management, since the existence of a market is a prerequisite for the application of such instruments. Expanding the scope of markets for water management tasks would also expand the (potential) scope for the application of economic steering instruments. Besides, opportunities for new ways of financing water management, for example through public-private contracts and co-financing, depend for a large part on the institutional framework in place. The fact that existing laws in water management were reviewed with regard to their suitability to accommodate these developments in governance proves this point. It must be noted, however, that markets are not necessarily regulated by market-based steering instruments. Laws and regulations drawing the boundaries of markets and rules regulating activities in that market may play an equally important role.

From the discussion of this operation, the impression rises that deregulation ('less bureaucracy, more efficiency') is regarded as a policy goal in itself. It can therefore be argued that in the discourse about integrated water management, two main goals can be distinguished: (a) healthy and resilient aquatic ecosystems that can meet the desires of present day and future societies and (b) an organisation of water management that provides for a water system that meets the (minimal) requirements by society against the least

¹²⁸ For a further discussion of informal rights to pollute, in particular related to policy regarding manure surpluses in The Netherlands, I refer to Dietz (2000). For examples in which this historical right to pollute is used as a resource in discourse, I refer to chapters 5 and 6.

(public or private) cost. Coalitions advocating these different goals are likely to have different interpretations of integrated water management and its operationalisation (either or not via economic steering instruments or evaluation methods). The statement above is in line with conclusion regarding the purpose of economic steering instruments and evaluation methods as drawn in chapter 3 and the conclusion earlier this chapter that the principles for water management as formulated in the WFD also serve these two different goals.

4.4.4 POLICY FOR NEW APPROACHES TO WATER MANAGEMENT

According to *NW4*, agriculture is strongly dependent on 'good' water quantity management, both with regard to farming the soil (the ground water level should not be too high) and with regard to productivity (the ground water level should not be too high, but should not be too low either, and salt concentrations should not be too high either). *NW4* also states that the major importance of accessibility of the Dutch ports and the navigability of the Dutch waterways for the Dutch economy 'need no further explanation' (Ministerie van Verkeer en Waterstaat, 1998: 117). With regard to water quantity management, it can be concluded that a strict water level control is mainly considered important from the point of view of traditional agriculture, transport and the prevention of water nuisance in houses. Sticking to this precondition of a strict water level control for these purposes may preclude innovation with regard to land use, spatial planning and transport. It does not provide the flexibility that may be needed for the adoption of innovative ways of dealing with water management that can bring water management closer to the goals of sustainable, integrated water management and healthy, resilient aquatic ecosystems. In terms of paradigms, strict water level control could be indicated as a modernistic measure, while spatial planning and land use based on more flexible water level management and/or adaptation to salinisation would be a post-modern approach. Which paradigm dominates can be observed from the designation of land use functions and the (suggested) related water quantity management regime. In this respect, a trend can be observed from traditional agriculture towards innovative agriculture, nature and other new land use functions.

Besides the quantitative aspects of water management, the importance of qualitative aspects of water systems is also recognised in *NW4*, not just for agriculture, but also for other functions of water systems. Good quality swimming water is considered an increasingly important economic factor. For agriculture, nature and fisheries, but also for certain branches of industry and households, the presence of good quality water is recognised as essential. From an ecological perspective, sustainable systems are important both with regard to the intrinsic value (value not related to utility for humans) and from an economic point of view. For example, 'spatial quality' can turn into an important economic factor by providing a positive condition for settlement of economic activities. A sound and efficient sanitation of polluted water soils, the spatial planning of recreational areas and the further development of the 'Main Ecological Structure' (*Ecologische hoofdstructuur*) are considered to be part of this (*NW4*, 1998: 117).

Although some movement into the direction of other functions can be observed, it becomes clear from the passages presented above that (economic) priority in water management (still) lies with the interests that were dominant in sectoral water management, especially with regard to water quantity management. A high degree of control of water levels is

considered 'an essential precondition for an economically and ecologically healthy functioning of society' (NW4, 1998: 117). The question is whether or not this is true. It might be true for a traditional approach to agriculture, housing, urban development and transport in the short term. In the long-term however, this approach to water level management may be detrimental even to those purposes for which it was installed in the first place. From a long-term, sustainable perspective, it is, *par excellence*, long-term effects of human activities that count. From this perspective, traditional approaches to spatial planning and land use are sub-optimal, to say the least. One example of this unsustainable situation is detailed water level control for traditional land use functions on peaty soils in The Netherlands, which causes land subsidence. This problem will become increasingly difficult to deal with in the future by reactive, technological measures, since the height difference between primary and secondary fresh water systems and the sea on the one hand and tertiary systems and land levels on the other will increase substantially. Besides, continued investments in these areas via traditional construction and production systems makes a switch towards alternative spatial planning ever more difficult, since such a switch would result in the destruction of this increasing density (and thus value) of capital. This issue will be explored further in the next chapter, in the discussion of specific issues in Dutch water management and new policy arrangements for these issues involving the application of economic policy instruments, such as those relating to spatial planning, agriculture, housing and urban development. In contrast with water quantity management, with regard to water quality management, the importance of good quality water (systems) is recognised in NW4 both in relation to economic activities and to bequest value (the value of healthy water systems for future generations) and intrinsic value (see above)¹²⁹.

4.5 COMPARISON OF ECONOMIC ELEMENTS OF WATER POLICY

COMPARISON OF ECONOMIC ELEMENTS OF WATER POLICY ACROSS GOVERNMENT LEVELS

The analysis of policy resolutions at various levels of governance included resolutions of lower public water authorities in The Netherlands. These resolutions were analysed with regard to specific policy aspects, such as (economic) policy principles, policy goals, management visions, measures and instruments as well. These elements were compared to similar elements at the EU and the national level. At first, the intention was to analyse water policy resolutions of provinces, water boards and municipalities. At the time of analysis, the national government had just started to stimulate municipalities to draw up municipal or urban water management plans as an approach to improve co-operation between water authorities, including municipalities, at the local level and to enhance the (new) role of municipalities in spatial planning issues involving water. However, few of those plans had been issued yet. At the time of research, most, if not all, municipalities had made sewer plans, but these plans in general are purely operational and contain a fairly traditional management and financing plan for maintenance and expansion of the sewer system only.

¹²⁹ For a discussion of various types of values, see figure 2.2

Therefore, in general they do not include most of the policy elements listed above. Because of the arguments made above, it was decided not to include municipalities in the analysis. Below, the relevant elements of water policy at various levels of governance will be compared, going from abstract to concrete elements.

Policy principles

The European Water Framework Directive (WFD) formulates a number of basic principles for sustainable water management. The main basic principles are the 'subsidiarity principle', the 'precautionary principle', the 'principle of preventative action', the 'principle of rectifying environmental damage at source' and the 'polluter pays principle'. Most of these principles have also been adopted at the national level in a more or less literal way. From the scanning of policy resolutions and policy analyses, it can thus be concluded that there is considerable overlap between the EU- and national level with regard to the policy principles to be used. This can be seen as an indication that at this level, vertical integration is taking place. Besides, policy principles at the EU and national level show considerable overlap with the juridical principles for integrated water management as presented in chapter 1. In reports of provinces and water boards, the policy principles mentioned above are not mentioned explicitly. Two possible reasons may be brought forward for this omission: either these policy levels are only concerned with practical aspects of policymaking and execution and leave the formulation of principles to higher levels of governance, or they are more careful about the opinions of their electorate/grass roots and leave principles out on purpose.

Policy goals

The European Water Framework Directive states as its primary goals 'an increased protection and improvement of the aquatic environment' and 'sustainable use of water' (EU, 2000: Articles 1c and 1b respectively). These elements can also be found in the (chronologically earlier formulated) Dutch national policy goals, in the passage 'keeping and enhancing *healthy and resilient water systems*, through which a *sustainable use of water* remains guaranteed (Ministry of Transport, Public Works and Water Management, 1998: 11). Compared to the European goals, safety is added as a policy goal at the national level. This aspect does not play a role at EU level, since the focus at this level (at least in the WFD) is on water shortage, water quality aspects and on the quality of aquatic ecosystems, and not on floods. The issue of flood protection and safety is left to the Member States and river basin management organisations¹³⁰. Sustainability and healthy ecosystems are also central themes of water policy at the provincial level. The province of Zeeland (2000) explicitly mentions sustainability and healthy ecosystems as the main policy goals in her provincial water policy plan. The province of Noord-Holland (1998) puts 'sustainability' and 'liveability' as its central goals. The same counts for the level of water boards. The joint water boards of Hollands-Noorderkwartier state as central goals 'healthy and resilient water systems' and 'a well maintained, controllable infrastructure', that guarantee 'a sustainable use' and

¹³⁰ Some argue that policy for river flood protection should also be regulated at EU level, because at present it is very difficult for Member States to arrange flood protection measures at the river basin level. Often, the right institutions are lacking for a strong international river basin approach. Such flood protection measures at the river basin level may be more effective and more cost-effective than each single Member State in the basin taking its own measures.

'sustainable amenity value' (Waterschappen in het Hollands Noorderkwartier, 1999: 15). Other water boards use similar wordings in their water management plans.

From this overview of policy goals, it can be concluded that policy goals at different levels of public water management authority show a large degree of similarity. However, it also shows that the lower the level of governance, the more emphasis is placed on anthropocentric aspects of water management. A possible explanation for this observation is that the lower government levels have a more direct interrelation with their electorate/grass roots. Therefore, policy goals tend to be stated more in terms of their interests. The stronger attention for anthropocentric aspects of water management, and especially for specific (economic) interests may have consequences for the way the concept of integrated water management is made operational. Often, at international and even national policy level, integrated water management has a clear link with sustainability from an environmental or ecological perspective. Since at lower policy levels socio-economic aspects play a larger role in policymaking, sustainability is often linked to the vitality of regional and local communities, which is more readily associated with the economic and social dimensions of sustainability.

Management visions (policy programmes)

Management visions or policy programmes can be regarded as the subject of normative discourse. They are one step more concrete than policy principles, but more general in nature than policy instruments and methods. At the EU level, the emphasis with regard to management visions is placed on two aspects: river basin management plans (including steps and measures taken to apply the principle of 'full cost recovery') and the introduction of policy for water pricing. According to *WNF*¹³¹ the WFD sets the right conditions for the promotion of an efficient and effective protection of water systems. According to this party, the implementation of the WFD should lead to a more rational use and protection of water, a lowering of costs for the purification of wastewater and a much better co-ordination of water management. At the national level, integrated water management, the water systems approach and region-specific approaches are central concepts in the management visions. In the provincial water management plans studied, no explicit references were found regarding management visions and policy programmes. At the level of water boards, there were. According to the joint water boards of Hollands Noorderkwartier, vision is needed, especially at the level of water boards, based on 'integrated water management' and a 'water systems approach', providing for a broader view on the many functions water can fulfil (Waterschappen in Hollands Noorderkwartier, 1999: 4). The option and bequest values (the value of water for future use by present generations and by future generations, respectively) of water can be maintained by developing sustainable water systems, the closing of loops in the water chain, economical use of natural resources and reducing the burden on the environment.

Although the visions at the EU and national level on the one hand, and on the level of water boards (represented by Waterschappen in Hollands Noorderkwartier) on the other show remarkable resemblance with regard to vision and ambition, it should be noticed that the motives for certain visions or proposed measures may differ substantially between levels of

¹³¹ The *WNF* (*Wereld Natuur Fonds*) is the Dutch branch of the World Wildlife Fund for nature (WWF).

governance. At the EU and national level, water policy is often justified from the perspective of 'what's good for the environment', which can be explained by a relatively independent vision that takes into account the representation of general, unrepresented and/or suppressed interests (which nature and the environment were for a long time in sectoral water management). At the level of water boards, the interests of the electorate or grass roots may be more readily taken as a starting point for policy choices, due to a more direct interaction with those stakeholders. For example, while at EU and national level a more rational (i.e. more efficient or effective) use of water is motivated from the perspective of protecting aquatic ecosystems, at the level of water boards more rational water use aims to prevent a rise in levies charged by water boards, which may lead to protests from tax payers.

Management measures and policy instruments

At the level of EU water policy, no concrete (operational) management measures are mentioned. The choice of measures for the implementation of EU water policy is left to a large extent to Member States, within the boundaries set by the WFD. However, it can be said that the WFD puts a lot of emphasis on implementing the polluter pays principle and the principle of full cost recovery, including environmental costs and costs due to damage to or negative influencing of the aquatic environment. This emphasis offers clear opportunities for applying economic, financial and fiscal instruments for the purpose of a more integrated approach to water management. At the national level, policy measures are dealt with according to the policy issues identified. The economic steering instruments as suggested in the *NW4* were already presented earlier in this chapter, and will therefore not be repeated here. The measures proposed to address the issues identified consist of a large mix of different types of instruments. Most of the proposed instruments are of the CAC (Command And Control)-type, are methods and instruments for public planning or consist of public projects. Suasive and economic, financial and fiscal measures are less abundant. Often, measures are formulated in terms of 'stimulating' and 'enhancing' certain desired activities, without specifying the way in which this should be done. Apparently, the operationalisation of general guidelines is done after formulating the white paper, not in advance.

In the comparison of water policy at various levels of governance, the emphasis was on documents issued by the policy domain of water management. However, policy that affects or may affect the state of water systems can also be issued in other policy domains. Other important ministries (or policy domains) in this respect are the Ministries of LNV ('Agriculture, Nature management and Food quality'), VROM (Housing, Spatial Planning and Environment), EZ (Economic Affairs) and Finance. The role of these policy domains in formulating policy and policy instruments that affect water systems was not addressed in this chapter. Their role will be discussed with regard to specific issues and policy arrangements for these issues in chapters 5 and 6.

At the provincial level, concrete measures are also grouped according to issue. In the water policy plan of the province of Noord-Holland (1998), all categories of policy instruments are mentioned. Remarkable, however, is that economic steering instruments are perceived as consisting only of subsidies to projects, co-financing of projects by the province and negotiations by the province for attracting more financing from elsewhere. The first two measures mentioned can be perceived as economic steering instruments (supporting

desirable initiatives), the third cannot. Economic steering instruments aim to change the behaviour of target groups by influencing their individual cost-benefit analysis of the options for action through economic incentives. This is not the case for the third type of measure. This measure can be called a financial or suasive measure. Besides, the application of regulating levies is not mentioned at all. An explanation for this 'omission' may be that the province considers regulating levies a type of instrument that is typically applied at national level, while earmarked levies (levies that first and foremost aim to finance public tasks) are regarded as instruments for water boards, since they are the main executive organisations in water management. For the measures proposed at provincial level, the same holds as for measures at the national level: often, the way certain measures (policy programmes) are to be operationalised and implemented via policy instruments is not specified.

At the level of water boards, measures are often of the CAC-type or public projects to be undertaken by the water boards themselves. However, in the water management plan of the joint water boards of Hollands Noorderkwartier, both earmarked levies and regulating levies and subsidies are mentioned. In general, it can be said that most of the levies charged by water management authorities are earmarked levies. One regulative levy that has proved itself is the pollution levy implemented after the adoption of the surface water pollution act (*WVO*). This levy has led to a substantial reduction of pollution by point sources, mainly from industry. Regulative levies affecting the (quantitative and qualitative) state of water systems are mainly initiated by the Ministry of VROM, as will show in chapters 5 and 6.

Market operation, privatisation and liberalisation

Market operation is a subject that predominantly receives attention in policy plans at EU and national level. At the time of writing this thesis, at the level of provinces and water boards, little attention seemed to exist for this subject. This is remarkable, since according to the Commissie Tielrooy, with regard to the policy approach of 'room for water' (see chapter 5), opportunities for letting the market pay for the benefits resulting from new water policy lie especially at the local and regional level. So far, however, the emphasis with regard to privatisation and liberalisation is on the drinking water chain and the supply of water goods and services by one private actor to another private actor. Public water management authorities hardly use or consider using the market-mechanism as a way to finance water management tasks. Especially water systems management is regarded as typically a public task and therefore not suitable for privatisation or liberalisation. A likely reason for focusing attention for market operation, privatisation and liberalisation of water and related services on the water chain instead of the water system, is that property rights in the water chain are better (and can be more easily) defined than those regarding water systems. As was mentioned before, the clear definition of property rights is a major precondition for markets to operate properly.

Nevertheless, in recent years some initiatives (both studies and practical initiatives) to increase the role of the market mechanism in water management, including in water systems management, have emerged at the local and regional level. Initiatives to study the introduction of the market-mechanism in water management on these levels are mainly undertaken by research institutes, consultancies and by order of representative organisations of regional and local public authorities, such as *UvW*, *VNG* and *IPO*. Most of these studies address the question how to finance public, non-profitable facilities (land use functions), such

as nature, water and infrastructure, by means of profitable land use functions, such as housing. Practical initiatives mainly relate to larger spatial projects, that combine public and private land use functions. Characteristic for these projects is that spatial planning issues are addressed in a comprehensive manner, in which public and private stakeholders co-operate (either or not in one legal entity) to realise (and thus finance) public and private facilities. Projects that operate according to such principles will be addressed in chapter 5.

The financing structure of water management

Attention for the financing structure of Dutch water management is mainly concentrated at the levels of national government and water boards, while provinces and municipalities seem to be less concerned about this matter. The reason for this may be that especially in surface water management, the scope of water managers will be expanded substantially in the near future. Surface water management is mainly performed by national water managers and water boards. Besides, the national government and water boards have traditionally played a larger role in water management than provinces and municipalities. As a consequence, the scope of activities of national water managers and water boards is larger than that of provinces and municipalities. Therefore, the latter organisations may not feel the need to get involved in this discussion. The reasons for scrutinising the financing structure of water management, however, are different for the national government and the water boards. At the national level, the main question is whether the present financing structure is suitable for implementing the policy formulated in the *NW4* (in other words: is the financing structure suitable for implementing integrated water management?). At the level of water boards the main reason for scrutinising the financing structure is that the present tax system is very complicated and fragmented. Simplicity and transparency of the financing structure can therefore be seen as the main goal of the operation at the level of water boards.

4.6 CONCLUSIONS

4.6.1 CONCLUSIONS ABOUT THE MANIFESTATION OF TRENDS

TRENDS IN SOCIETY

On the basis of this chapter, the following remarks can be made with regard to the manifestation of societal trends in Dutch water management:

- The trend in society towards globalisation is reflected in the trend in governance towards internationalisation (see below);
- The trend towards individualisation can be felt in the fact that the range of claims on water systems is expanding;
- The trend towards rationalisation and economisation is reflected in policy in the strong emphasis on calculability and economic rationality (efficiency, cost-effectiveness, full cost recovery and the 'market operation, deregulation and legislative quality'-operation) in both European and national water policy;
- The trend towards the emergence of post-material values can be felt in the increased attention for non-material values of water systems and aquatic ecosystems and in

increased efforts to make these values more explicit, amongst others via economic elements of policy.

TRENDS IN GOVERNANCE

With regard to the manifestation of trends in governance in Dutch water management, the following can be said:

- The trend towards deregulation shows amongst others in the EU-policy principle of subsidiarity, in policy resolutions at the national level calling for 'area-specific' approaches and in the national operation of 'market operation, deregulation, legislative quality' (MDW);
- The trend towards internationalisation shows from the fact that policy formulated at the international level (both global conferences and the EU) is becoming ever more decisive for policy in nation states. Besides, the EU WFD formulated (international) river basins as the most suitable unit for water management;
- The trend of ecological modernisation can be felt in the fact that much policy is directed at adopting ecological principles in existing institutional structures;
- The trend of rationalisation and institutionalisation of environmental policy can be clearly felt in the quantitative approach to ecological quality in the WFD. Besides, this trend shows from the strong emphasis on (financial and economic) controllability of water management activities in European water policy.

4.6.2 CONCLUSIONS ABOUT ECONOMIC APPROACHES IN DUTCH WATER POLICY

GENERAL CONCLUSIONS

- In policy resolutions, no clear priority order of policy principles was found. This makes the performance of policy based on these principles contingent on the dominance of certain principles for each specific situation and each level of governance;
- The review in this chapter of economic elements of water policy and the application of economic instruments in various EU Member States showed that although attention for economic approaches has increased in recent years, the scope and profundity of these initiatives is not as large as may be expected on the basis of theoretical possibilities. In a number of situations, economic approaches to water management were not found where these could be expected on theoretical grounds.
- The discussion of the elements of policymaking (especially goals and principles) in this chapter showed that efficiency is indeed an important point of attention in policymaking regarding water management. This efficiency does not only relate to the use of water and goods and services from aquatic ecosystems, but also (and probably even mainly so) to the use of public and private financial resources. This discourse about the interpretation of the term efficiency can be regarded as a struggle for discursive hegemony between actors supporting the trend of rationalisation of policy and those supporting the trend of the emergence of post-material values.

CONCLUSIONS REGARDING THE TRANSLATION OF INTERNATIONAL POLICY

From the comparison of policy resolutions at different levels of governance in this chapter, a number of conclusions can be drawn with regard to the scope and content of economic policy approaches at various levels of governance:

- Policy measures at higher levels (EU and national) are usually formulated in vague and general terms, which leaves it unclear which types of policy instruments are intended for implementation of these measures;
- The policy principles presented at EU and national level fit with an approach to water management according to the paradigms of 'resource management' and/or 'eco-development'. These principles in general do not obstruct or even facilitate the application of economic steering instruments. Besides, they enable the implementation of integrated water management as defined in this thesis;
- The ecological tendency of the economic principles formulated in the WFD aims to guarantee a certain degree of incorporation of ecological aspects in economic decision-making and may thus contribute to efficient use of water and aquatic ecosystems;
- The analysis of policy resolutions of various levels of governance in Dutch water management shows that there is considerable horizontal and vertical integration of policy. This is much less the case with regard to policy implementation, since in the stage of implementation, principal and practical obstacles surface. The lower the level of governance, the more anthropocentric the policy goals are. Strictly formulated policy principles at EU or national level, especially regarding the environment, are often flawed at lower levels of governance. Besides, other policy principles are formulated that potentially conflict with the policy principles at higher levels. Generally speaking, at the lower levels of governance, there is more attention for the social and economic dimensions of sustainability, while at the national, EU and international level, there is more focus on the ecological dimension;
- The international, European and national level are the main levels of governance paying attention to market regulation of water management tasks. This attention is mainly directed at the drinking water chain. However, according to the *Commissie Tielrooy* (2000), especially at the local and regional level, with regard to the policy approach of 'room for water', opportunities exist to make the market pay for the benefits this new water management yields;

CONCLUSIONS REGARDING DUTCH WATER POLICY

- The *ex ante* evaluation of the desirability and feasibility of economic steering instruments and evaluation methods in *NW4* showed that the institutional framework causes obstacles with regard to the accommodation of these instruments and methods.
- The application of regulating levies in Dutch water management is (very) limited. Most of the levies applied are earmarked levies, with the primary goal of financing specific water management tasks. Those regulating levies that do relate to water management are usually initiated by Ministries other than the Ministry of Transport, Public Works and Water management (mainly by VROM);
- With regard to the financing of management tasks of water boards, the old adage 'interest-payment-influence' potentially conflicts with the policy principles formulated at EU and national level, such as the 'polluter pays principle', the principle of 'full cost

recovery' (including environmental costs) and the principle of 'rectifying environmental damage at source'. Whether or not it does depends on its interpretation. If interpreted in the narrow sense of sectoral water management, the adage is likely to obstruct the implementation of integrated water management. Especially the link between 'payment' and 'influence' can be regarded as hampering an integrated approach;

The conclusions drawn in this chapter will act as guidance for the explanation of phenomena in the case study chapters 5 and 6.

CHAPTER 5 ECONOMIC POLICY ARRANGEMENTS IN WATER SYSTEMS QUANTITY MANAGEMENT

5.1 INTRODUCTION

5.1.1 PURPOSE OF THE CHAPTER

In chapter 4, an overview was presented of economic elements in water policy. At the end of the chapter it was concluded that although attention for economic approaches in Dutch water management has increased in recent years, the scope and profundity of these initiatives is not as large as may be expected on the basis of theoretical possibilities. In this chapter, I will analyse a number of arrangements addressing major policy issues related to water systems quantity management in The Netherlands. This analysis will be based as much as possible on the scheme as presented in Annex II and discussed at the end of chapter 3. This structured analysis of arrangements in water systems quantity management should lead to the identification and explanation of factors hampering the introduction of such economic approaches for this aspect of water systems management. In chapter 6, the same will be done for issues in water systems quality management. In chapter 7, the arrangements for issues in water systems quantity and quality management will be compared to analyse whether or not similar factors play a role with regard to the use of economic policy instruments and evaluation methods. In other words, I will address the question whether the application of economic policy approaches to address issues related to different aspects of water systems management are influenced by the same factors in the policymaking context. In terms of the general method for empirical analysis, I will look for themes and patterns between the issues described. Besides, the results of chapters 5 and 6 will be compared to the results of chapter 4 in order to analyse if the (similarities and differences in) specific results of chapters 5 and 6 can be explained by general factors (as described in chapter 4) or by aspect- or issue-specific factors (as described in chapters 5 and 6).

5.1.2 STRUCTURE OF THE CHAPTER

Section 5.2 provides an overview of present day issues in water quantity management and the dominant policy to address these issues. This discussion serves to place the economic

approaches as addressed later in a broader context. In section 5.3, I will analyse the discourse about the use of centralistic economic steering instruments to influence water demand by private actors (demand management). In sections 5.4 and 5.5, policy arrangements will be discussed involving economic instruments or evaluation methods that aim to regulate water quantity by supply management. Through these approaches, the policy concept of 'room for water' (see section 5.2) is made operational. As will be shown in section 5.4, research and experiments are undertaken to study possibilities for letting farmers or other landowners provide for water quantity related services. Besides these approaches, many potential other options exist for market-based instruments in water quantity management, involving different (private and public) actors and different types of instruments. In section 5.5, the role of economic methods for project evaluation is discussed with regard to the policy of 'room for rivers'. The chapter ends with a summary of the factors in the policymaking context that influence the application of economic policy instruments and evaluation methods in water systems quantity management (section 5.6).

5.2 POLICY FOR WATER QUANTITY MANAGEMENT

5.2.1 INTRODUCTION

This section will present a short overview of current issues in water systems quantity management and dominant policy approaches towards these issues. These policy approaches may or may not include the use of economic policy tools and instruments. Before discussing these issues and related policy, it is useful to give a definition of 'policy issues related to water systems quantity management'. First, I will address the term 'policy issues'. 'Policy issues' were defined in chapter 2 as '(societal) issues that have entered the political and/or administrative arenas and that according to a majority of actors or according to the most powerful actors in these arenas need to be addressed through public policy'. In this thesis, policy issues in water systems quantity management are interpreted in two ways. In the most common interpretation, they are issues addressed by policy resulting from either an excess or shortage of water as a consequence of physical phenomena or human activities not undertaken from the perspective of water management. The human activities referred to here are usually activities by private (economic) actors, which can in principle be 'corrected' by public intervention. However, excess or shortage of water can also be the result of (public) water management. Therefore, in this thesis, a second interpretation is given to policy issues related to water systems quantity management, namely those issues that are the consequence of (a specific type of) public water systems quantity management.

5.2.2 CURRENT ISSUES AND RELATED POLICY IN DUTCH WATER QUANTITY MANAGEMENT

INTRODUCTION

As was already indicated in the first chapter of this thesis, for a long period of time, water quantity management in The Netherlands was organised to optimally serve a number of sectoral interests, mainly that of agriculture, transport and industry. Besides serving these

sector specific interests, Dutch water management has focused for centuries on serving the general interest by taking flood protection measures (which can be regarded as the traditional interpretation of the issue of 'safety' in water management). As was indicated in the first chapter, this sectorally organised water quantity management has caused a considerable number of negative side-effects on society and on the environment. Strictly speaking, the negative side effects of sectoral water management were both quantitative, qualitative and not (directly) water related in nature. Examples of quantitative side effects were desiccation, local water nuisance because of fast drainage and a lack of retention and storage capacity, exhaustion of the fresh ground water reserves and increased flood risks because of an exclusively technical approach to flood management. Qualitative side effects were salinisation as a result of excessive pumping and deterioration of water quality because of the flushing of secondary and tertiary water systems with water of different quality from the primary water system (the main fresh water system, including the major lakes and rivers). A side effect not directly related to the state of water systems is subsidence of peat soils. Indirectly, however, the consequences of this soil subsidence are again mainly related to water. Subsidence increases the difference in height between the tertiary and secondary water systems on the one hand and the primary system and the sea on the other. This mechanism has two main negative effects, namely increased salt intrusion and increased flood risk from both the sea and the primary fresh water system. Besides, increased efforts are needed to discharge water from the tertiary system onto the secondary systems and from the secondary system onto the primary system and the sea in order to 'keep dry feet'.

Although the negative effects of this sectoral water management are not necessarily quantitative in nature, they are regarded as water quantity problems, since they explicitly result from (sectoral, public) water systems quantity management. The question how these negative effects can be prevented or mitigated is therefore regarded as a policy issue related to water quantity. In the past decades, the problems resulting from a sectoral approach have been increasingly acknowledged. As a consequence, policy approaches have been formulated and implemented to deal with these issues. Directly below, I will give a short description of current issues in water quantity management, together with a description of the dominant policy to address the issue.

ISSUES RELATED TO SECTORAL WATER QUANTITY MANAGEMENT

Desiccation

Desiccation can be defined as damage to ecosystems caused by a too limited availability of water. Desiccation in The Netherlands is a relative issue in the sense that the regulation of water quantity for specific economic purposes (mainly agriculture) causes damage to ecosystems that were (either or not intentionally) created by human activities, since most part of The Netherlands has been cultivated somehow and can therefore not be called a natural landscape. The weight given to desiccation as a policy issue is thus a result of a societal and political process of priority setting. Often, the type of ecosystem envisaged for a certain area is politically determined, based on (historically present) geo-hydrological circumstances, the (resulting) suitability for specific land use functions and the ambition with regard to ecosystems (as compared to other land use functions). Therefore, the problem of desiccation is usually expressed in terms of the degree to which the hydrological situation

hampers the creation of the desired ecosystem. Desiccation can occur both by extraction of deeper, relatively isolated ground water layers, and by the regulation of the level of surface water and shallow ground water. Extraction of surface water can also cause a shortage in water supply to ecosystems, but this effect is usually temporary in nature and will therefore have limited consequences in terms of desiccation. Dessication as a consequence of the limited availability of ground water is usually more structural in nature. Both mechanisms of desiccation and the policy arrangements to address them will be described separately, since they involve different actors, institutional frameworks and locations.

Desiccation by drainage

Drainage of surface water and shallow ground water is done mainly for two purposes: to enable cultivation of arable land and to keep real estate and infrastructure dry. For these purposes, the ground water level is maintained at an artificial, low level. Besides, the water level is usually not allowed to fluctuate, or only within very narrow margins. This high degree of control of the ground water level for the purposes described above has often caused dessication of nature in adjacent areas.

As a policy approach to the first cause of dessication, some nature areas are nowadays being protected from desiccation by drainage by installing a buffer zone around those areas, in which agriculture is adapted to the 'demands' of the nature area. Farming that contributes to the management of nature areas is usually referred to in The Netherlands as 'agricultural nature management' (*agrarisch natuurbeheer*). Besides the reduction of desiccation, the installation of a buffer zone around nature areas in which agricultural nature management is practiced may also yield other advantages for the nature area, such as the improvement of the quality of ground and surface water. Examples of measures according to agricultural nature management are a reduction in the application of fertilisers and pesticides and accepting an on average higher water level. These measures may, but not necessarily do, reduce the range of traditional land use options and the yield of agricultural production. Such losses in yield or options as a consequence of co-operating in the protection of nature are usually compensated for. The terms under which this compensation takes place is an important aspect of the agreements between (public) nature managers and farmers. Arrangements to organise this agricultural nature management will be discussed in more detail later this chapter, when discussing 'green and blue services'.

With regard to the second cause of dessication, the locations of buildings and infrastructure may be based on geo-hydrological information (indicating which locations are suitable for building from a hydrological perspective). Another approach is to adapt buildings and infrastructure to the presence of high ground water tables. This may be done for example by constructing buildings without cellars, or by building floating houses and infrastructure. In the past, the choice of locations for housing, business parks or infrastructure was hardly based on geo-hydrological information, which resulted in buildings suffering from frequent or permanent problems with water nuisance. Since moving these buildings or constructions would be a very costly matter, this has created a situation in which the problem cannot be solved permanently. Instead, a situation has been created in which only the symptoms can be addressed. As a consequence, continuous measures are necessary to address this issue, until the building or construction is replaced. Such situations may be prevented by adapting

the location and design of buildings and infrastructure to the presence of water. This strategy is represented by the policy principle 'water as a pre-condition for spatial planning'.

Desiccation by ground water extraction

Groundwater in deeper layers is used for various purposes, such as the preparation of drinking water, as resource for industrial processes (food industry, electronics, etc.), and for irrigation of farmland and private gardens. Desiccation by extraction of ground water is mainly an issue in and along the borders of higher, sandy areas. Extraction of ground water causes two types of desiccation. The first is a general lowering of the ground water table, making it harder for vegetation to reach the ground water reserves. The second is a reduced supply of ground water to springs in lower areas adjacent to higher areas (seepage). This reduced seepage may have negative consequences for 'seepage dependent vegetation' (*kwelafhankelijke vegetatie*). This specific group of vegetation is usually located in 'seepage zones' (*kwelzones*) both because of the moist conditions and a specific (good) quality of the surfacing water. The presence of this vegetation thus depends on both the specific quality and the sufficient quantity of water. There have been several policy responses to the problem of desiccation through ground water extraction. An emergency measure in times of water shortages is a decree by water boards stipulating a priority order for the use of ground water and surface water to prevent long-term damage to aquatic and terrestrial ecosystems. This decree can for example prohibit or limit ground and surface water extraction for the sprinkling of crops and gardens. Besides this emergency measure, more structural approaches have been implemented, which will be discussed below.

General policy programmes to address desiccation

In The Netherlands, general and structural policy approaches towards both mechanisms causing desiccation consist of (a combination of) different types of policy instruments. They include, for example, ground water extraction taxes, public-private partnerships with regard to surface water management, subsidies and (ad hoc or structural) regulations to restrict ground water extraction and establish a shift from the use of ground water to the use of surface water for various purposes. An example of such shifts are farmers that use surface water instead of ground water for irrigation and the preparation of drinking water from surface water. These structural approaches have resulted in a reduction of desiccation in a number of areas. In some cases the measures to address desiccation have even caused nuisance in urban areas as a consequence of a risen ground water table. Of the instruments mentioned above, the ground water extraction tax will be discussed in more detail in section 5.4 and public-private partnerships that take account of desiccation and other water quantity related issues will be discussed in section 5.5.

Salinisation

Salinisation can be defined as an increase in salt concentrations in fresh (surface and ground) water systems. Salinisation of surface water and shallow ground water is mainly caused by two mechanisms. The first is intrusion of salt water into estuaries and rivers, the second is the surfacing of salty ground water due to a reduced layer of fresh water in the top layer of the soil. The first mechanism is combated in a technical way by regulating the amount of fresh water that flows through different branches of the major rivers in The Netherlands, thus selectively 'flushing out' (or rather 'pushing back') the salt water. The second mechanism cannot be easily dealt with by technical means. It is a more pervasive

phenomenon and a more fundamental problem. The soil below The Netherlands contains a thick layer of salt water, caused both by dissolution of salts in the soil and by intrusion of salty water from the North Sea. On top of this layer of salt water rests a layer of fresh water, originating from precipitation and inflow of fresh water from abroad. Since fresh water has a lower specific gravity than salt water, fresh water will float on salty water. As long as the fresh water column floating on the salty water in the soil is thick enough, the salty water will be pushed down and will not reach the surface. In the early days of cultivation of The Netherlands, salinisation was hardly an issue, since the fresh water layer was thick and the demand for fresh ground water and drainage was not very high yet. However, as the population increased, the demand for drinking water and productive agricultural systems increased, thereby increasing the extraction of deeper ground water and the drainage of shallow ground water and surface water, respectively. Due to especially ground water extraction and drainage, in the course of centuries the fresh water layer in The Netherlands thus became ever thinner, up to the point that salty water has reached the surface, especially in the low areas in the west of the country, where land lies low and salt water seepage is strongest.

Policy approaches to salinisation

Initially, in sectoral water management, the problem of salinisation was addressed in a technical and (thus) reactive way, by flushing the brackish polders and canals with fresh water from upstream. In some areas, this caused a new problem, since the water from the rivers often had a different quality than the local water, which stemmed from rain water. The water from the rivers was inferior in quality, being polluted by all kinds of domestic, agricultural and industrial processes. By flushing polders with river water, this water polluted the local water systems, having a negative effect on the health of aquatic ecosystems. This issue of the inlet of non-area specific water will be discussed further below. In recent years, the policy approach has shifted towards more preventative measures. For example, extraction of fresh water from the dunes for drinking water preparation has been reduced, allowing the fresh water reservoir in the dunes to increase in volume (and thus in weight). Extraction of ground water has also been reduced more inland, as was described above in the part about desiccation. This is also meant to have a positive effect on the replenishment of groundwater layers. The basic approach towards desiccation and salinisation is similar. However, whereas desiccation can be addressed relatively easily through local water quantity measures, the problem of salinisation is more pervasive (at least in the western part of the country) and will require more radical changes in water and land use in order to address it in a structural way. The same can be said about the issue of subsidence, which is discussed below.

Subsidence

Subsidence is the process in which the surface level of land is falling due to the oxidation and compacting of peat soils. Oxidation is the process in which peat (soil rich in organic material, composed of rotten vegetation) is exposed to air and reacts with oxygen. Through this reaction, it is decomposed into (mainly) CO₂, H₂O and minerals, losing its structure during the process. Compacting of peat soils is the process in which soil previously saturated with water (under the groundwater table) becomes unsaturated (by lowering the ground water table). The effect is that it loses its structure and therefore its volume, comparable to the

compacting of a sponge. In contrast to a sponge, with peat this process is irreversible. Once compacted, the peat soil will not take up water and expand anymore.

Subsidence of land is mainly an issue in the western parts of the country, where thick layers of *laagveen* (lowland peat) exist. Subsidence also occurs in areas with highland peat (*hoogveen*), but in those areas, there is no direct threat of flooding by rivers or the sea, and therefore, it is less of an issue in water management. However, oxydation and compacting of peat in higher areas causes peat to disappear as well, and with it its characteristic ecosystems. With regard to *hoogveen*, water management problems can be (and are) considered as issues of *desiccation*. In low areas, subsidence causes a number of problems related to those of salinisation. The increasing difference in height between the polders and the secondary and primary water systems creates a continuous need for more pumping capacity to keep the polders dry. As a result of the pumping, these polders act like wells, drawing salt water from layers underneath the fresh water. Besides, these polders also drain water from higher areas surrounding the polder, which may lead to dessication in those higher areas. Salt water seepage creates problems with regard to water quality. A common reactive policy approach to this problem is to flush the polders with fresh water from secondary and primary water systems from time to time. As was announced before, this caused a new issue related to water quality which will be discussed further below.

Policy approaches to subsidence

As was indicated in the discussion of salinisation, both salinisation and subsidence are pervasive problems that result from former land reclamation and cultivation activities, mainly directed at increasing the area of arable land and agricultural output. In those days, these problems could hardly be foreseen, since the mechanisms leading to these problems and the impact of human activities on these mechanisms were unknown. This heritage causes a dilemma for the Dutch. A structural prevention of the problem can only be achieved by drastic changes in the spatial and land use planning of lower peat areas (no drainage, so no polders). However, such drastic changes are unlikely to happen in the short and middle long-term, considering the high degree of capital investments in especially these areas. In the long-term, however, this may be the only land-use option left.

The strategic question in this respect is whether efforts should be directed at adapting land use to the emerging and inevitable situation as soon as possible or to continue traditional land use and capital investments and protect this increasing stock of capital by traditional, technical flood protection measures, for as long as possible. The latter option creates a lock-in into traditional approaches to water quantity management, since the present production and land use systems do not allow a different approach, and since increased investments into the flood protection system protecting these polders evokes and legitimises continued investments in protected areas and vice versa. A different approach would be to slow down subsidence and salinisation as much as possible and adapting land use in areas where salinisation does occur. The slowing down or halting of subsidence may be achieved by raising water levels in peat areas. The dominant policy approach, as suggested by the Commission for water management in the 21st century and adopted by the cabinet, is similar to the approach suggested for addressing the other major issues caused by specific water quantity management (desiccation and salinisation). This approach will be discussed further below. The strategic choice as posed above is one between policy paradigms. On the one

hand, there is the risk-seeking approach, according to which measures are taken as long as they fit the present production and consumption patterns and which can be regarded as an approach of fighting symptoms. On the other hand, there is the risk-averse approach, which suggests to adapt land use to the characteristics of the water system and which can be regarded as a structural approach, addressing the cause of the problem.

Inlet of non-area specific water

Another negative externality resulting from sectoral water quantity control is the inlet of water from the primary water system (the major rivers, large canals and the IJsselake) into *boezems* (secondary water systems) and *polders* (tertiary water systems). The purpose of this activity is to provide for sufficient water in these systems in order to enable the continuation of certain vital economic activities and in order not to permanently damage infrastructure and ecosystems. The reason this supply is needed is that the (historically grown) water management systems are designed to drain excess water in the secondary and tertiary systems in wet periods and discharge it into the primary water system and then into the sea as quickly as possible, in order to enable the cultivation of land and to keep 'dry feet'. As a consequence, in this system, hardly any buffering and therefore storage of fresh water takes place. As a consequence of this lack of a water stock, in times of low precipitation, water shortage will quickly emerge. In order to enable the continuation of activities depending on sufficient water supply (such as agriculture and industry), water from the primary system is therefore led into the secondary and tertiary systems to fulfil the quantitative demand for water. Besides, water from the primary system is used to flush the secondary and tertiary systems to prevent water quality from deteriorating (mainly due to salt intrusion and the growth of algae due to eutrophication). However, the water from the primary system often has a different quality than that of the secondary (regional) and tertiary (local) systems. Therefore, this water often results in deterioration of regional and local water quality, having negative effects on specific types of (desired) aquatic ecosystems which depend on a specific water quality. This approach in water quantity management can be regarded as a typical example of a reactive approach to water problems fighting symptoms and causing new problems.

Surface water nuisance and flood risks

In this thesis, surface water nuisance is interpreted as water nuisance caused by either insufficient or too quick drainage, discharge or superficial run-off after local or regional precipitation. In principle, water nuisance could also be caused by precipitation in upstream areas of the catchment of the major rivers, but this nuisance is usually accompanied by flood risk, and is therefore rated as a flood risk issue in this thesis. Besides, water nuisance can be caused by high ground water tables or ground water seepage. However, this is a different type of issue, mainly caused by ground water management, which will not be addressed in this thesis. Surface water nuisance as interpreted in this thesis may be caused by various mechanisms, such as increased hardening of surface (and thus a lack of retention capacity) either or not combined with a 'too effective' surface water discharge system (either via surface water systems or sewer systems) and/or a limited buffer (i.e. storage) capacity of the local or regional water system. Flood risks can originate from high discharge volumes by rivers or by the sea. Flood risk caused by the sea is not addressed in this thesis. At present, the dominant ontological discourse in water management is that surface water nuisance and

(river) flood risks are caused by similar mechanisms related to traditional water management as are the issues described earlier (which means that water management serves other land use functions, no matter the suitability of the location, and that excess water should be discharged as quickly as possible). Not surprisingly, the dominant normative discourse is that excess water needs to be addressed in a similar way as water shortage and the related effects. This approach will be discussed below.

A NEW APPROACH TO CURRENT ISSUES IN WATER QUANTITY MANAGEMENT

As a reaction to high water levels in the rivers Rhine and Meuse in 1993 and 1995 and local water nuisances in the western parts of the country in the late 1990s, a commission (*Commissie waterbeheer 21ste eeuw*, see for example *Commissie waterbeheer 21ste eeuw*, 2000) was installed by the secretary of state of water management (*Verkeer en Waterstaat*) and the chairman of the Union of Waterboards (*Unie van Waterschappen*). The assignment for this commission was to study the required water policy, management and infrastructure to deal with the challenges for water management in the 21st century in The Netherlands, in the light of processes on a macro scale, such as climate change due to the green house effect. In 2000, this commission published their advice (*Commissie waterbeheer 21ste eeuw*, 2000). This report acknowledged both the problem of excess water in winters and of water shortage in summers. It also suggested to address water quantity related issues, as far as they are caused by surface water quantity management (desiccation, salinisation, subsidence, inlet of non-area specific water, water shortage, excess water), in a joint manner. The approach to water quantity management suggested by the commission is one aimed at creating more 'room for water' (*ruimte voor water*).

In this policy approach, a priority order was presented for dealing with excess water, indicated as 'retention, storage, drainage' (*'vasthouden, bergen, afvoeren'*) (*Commissie waterbeheer 21^{ste} eeuw*, 2000:37). The steps in the tryptich will be explained below. The first step in this approach (retention) is aimed at retaining as much precipitation as possible on the spot. One of the ways in which this is to be achieved is by expanding the area of natural aquatic and terrestrial ecosystems, which act as sponges, absorbing excess water and slowly releasing the water in dry periods. Depending on the location and scale of the measures, they may contribute to preventing river floods and/or local and regional water nuisance. One way to realise a number of goals in water and nature management in a joint manner is to bring back 'normalised' (i.e. straightened and controlled) water systems in their (more) original state. This 'reconstruction' of brooks and small rivers (re-introduction of meanders, expanding the flood plain, 'nature development') also contributes to this goal. Besides retaining water by restoring natural systems, water can also be retained by slowing down the drainage of water from 'cultivated' areas (agricultural land, infrastructure, urban areas). This can be achieved by measures such as disconnecting the drainage of precipitation from the sewer system combined with local infiltration or retention.

The second step in the priority order in water quantity management is water storage. For this strategy to take effect, the storage capacity of a large number of water systems will have to be expanded. This can be done in a number of ways. Firstly, the storage capacity of the water system can be structurally expanded by enlarging the area of surface water. This is referred to as horizontal expansion of water storage capacity. For this purpose, explicit

spatial reservations will have to be made for surface water bodies in spatial development plans. Secondly, the capacity of water systems can be expanded by allowing for (more) water level fluctuation. This approach is referred to as vertical expansion of water storage capacity. This measure may have consequences for land use, especially in situations in which this measure is applied to local water systems in urban and agricultural areas. Horizontal expansion is no use without vertical expansion, because storing a volume of water requires three dimensional space. A third measure is temporarily expanding the area of surface water, by inundating land. This third measure is usually only considered in case of emergency. However, later in this chapter I will show that studies are being done with regard to more structural application of this type of measure for water quantity management. The third step in the triptych (discharge) is the last step, and the lowest in ranking. This measure is taken when even after exhaustive utilisation of the options in the first two steps there is still an excess of water. Discharge of fresh water into salty water bodies (the North sea) means 'loosing' the fresh water until it re-enters the river basin via the hydrological cycle.

From the description of the (widely adopted) strategy towards water systems quantity management as described above, it becomes clear that in the presently dominant normative discourse, there is a plea for a more structural (and therefore more sustainable) approach that aims at building local and regional water reserves in wet periods to be used for dry periods. In other words, the aim is to create more robust systems by introducing flexibility and buffer capacity. The argument used is that robust systems need less fine tuning, and is therefore less vulnerable to changes in exogenous factors.

Scope of the effects of this policy

A remark can be made here with regard to the inherent sustainability of this new approach. Since the triptych is mainly directed at addressing the management of excess water in times of high precipitation and water shortage in times of low precipitation, it may be an elegant approach to the temporary problems of water excess and (relative) water scarcity. Retention and storage of water can prevent passing on problems of flooding to downstream areas in wet periods and can reduce problems of water shortage in dry periods. The policy may also contribute to reducing the more pervasive problem of desiccation. To some degree, it may reduce the need for inlet of non-area specific water and may incidentally even help locally in slowing down the processes of subsidence and salinisation. However, the approach will not be a structural solution to the latter two issues. As long as the water level in the polders is artificially kept below the level of the land and below sea level, the processes of subsidence and salinisation (respectively) will continue. Basically, the only structural solution to the problems of subsidence and salinisation would be to stop water quantity management in the parts of The Netherlands under sea level and let these areas turn into a marsh. Processes of vegetation growth, their decomposition and storage would allow the growth of peat, which would cause the land to grow in a vertical direction. Since this solution would prohibit many of the present land use practices, and since adaptations to this situation would require enormous efforts, investments and capital destruction, at present this is not considered a serious alternative in policy. Such a radical switch in land use thus raises the issue of concordance. The present approach, which is a shift towards a sustainable approach, but largely within the present institutional framework, can be regarded as being an exponent of the trend of ecological modernisation, which aims at gradual change towards a society based on ecological principles.

Policy instruments in the new approach

Instruments suggested for the introduction of this new approach in water quantity management are predominantly planning instruments and CAC-instruments. In order to be able to meet the demands of water policy and of water systems in spatial developments, specific attention was paid in recent years to a number of instruments to improve the position of water in processes of spatial planning. Examples of such planning instruments are the *waterkansenkaart* ('map for water opportunities') and the *watertoets* ('the water test'). These instruments were already discussed shortly in chapter 4.

Economic elements of the new approach

Although the emphasis in the new approach is on planning instruments and command-and-control instruments, some economic policy approaches are suggested in the context of the new water quantity policy as well. An obvious and generally applicable economic instrument is subsidies. However, this type of instrument was not addressed in this thesis, and will therefore not be discussed here. Other economic approaches being studied and applied within this policy are 'blue services' and public-private partnerships. Blue services are services provided by private landowners to public water managers contributing to a specific water management goal, for which the private actor is compensated by that public water manager. For example, farmers may allow water boards to inundate their land to prevent worse water damage elsewhere. The conditions for such services are specified in contracts between the public water manager and the private (group or representative organisation of) landowner(s). These situations typically involve incomplete contracts. The possibility of letting private landowners contribute to public water management was first mentioned in relation to farmers in the *Tweede Structuurschema Groene Ruimte (SGR2)*, the second national white paper for the 'green' environment. The concept of '*blauwe dienst*' is analogous to (and derived from) the '*groene dienst*' (green service), which made operational the idea that farmers (or other private landowners) could contribute to nature management. The concept of *blauwe diensten* will be further discussed in section 5.5. Public-private partnerships is increasingly considered an interesting arrangement for realising both public and private interests related to spatial or infra-structural projects. The general principle is that public authorities co-operate with private actors to realise a spatial or infra-structural project. In these arrangements, public authorities (including water managers) set preconditions with regard to the realisation (and financing) of public facilities in the area and may also set preconditions for the realisation and exploitation of private facilities. For this purpose, a range of agreements is made based on private law, in which these conditions are settled. The concept of public-private partnerships for the realisation of spatial or infrastructural projects with an impact on water management is discussed in section 5.6.

It must be noted that in the discussion of issues related to sectoral water quantity management, only negative side effects were addressed. However, obviously, the sectoral approach to water management has also led to positive effects for Dutch society. It has enabled the inhabitation and cultivation of a delta which previously for a large part consisted of marshes and wetlands and has made agriculture and transport important pillars of the Dutch economy. The concept of integrated water management was introduced in the 1980s to be better able to deal with water related issues, either or not resulting from sectoral water management. However, the conviction that integrated water management is a better (that is to say more sustainable) approach than sectoral water management does not necessarily

mean that this approach will not cause any negative side effects. The major difference with the sectoral approach is its comprehensiveness. The strategy of integrated water management is to study the (possible and actual) effects of public and private water related activities as comprehensively as possible (including the effects for the long-term), precisely in order to identify and prevent or properly deal with negative side effects of public policy and private activities and to better use the positive values of water and aquatic ecosystems. This approach is expected to result in less (grave) undesirable side-effects for nature and society. As such, integrated approaches to water management are expected to lead to better or even optimal situations (on the long-term) for society as a whole (including nature) compared to the situations created by sectoral water management, which was more focused on specific, direct benefits on a shorter term.

In this section, a number of issues in water systems quantity management were discussed, together with traditional sectoral policy approaches and new approaches to these issues. When describing these issues and comparing the old and new approaches to these issues in terms of the analytical framework, the following can be said. The issues addressed in water systems quantity management fall in both the category of temporary and structural issues. The occurrence of excess local, regional, national or international precipitation are temporary issues, but they are manifestations of long-term trends in nature (climate change). The occurrence of seasonal water shortage also falls in this category. Both are the consequence of a combination of trends in nature and the specific technocratic approach used to address these issues. Typical of this technocratic approach is that it creates substantial new problems. Most of these problems are structural in nature or may have long-term effects. The basic strategy in the old approach were public interventions in the water system itself. In this approach, there is little room for economic principles or instruments. In the new approach, the strategy is to involve private actors (mainly landowners) to get involved in water management. This approach in principle leaves more room for the application of economic principles. The old approaches mainly addresses the symptoms of issues related to water systems quantity, while the new approach aims to address the cause or prevent or mitigate the occurrence of the symptoms. With regard to addressing the issues, at first sight, there is not a fundamental difference in scale of policymaking or governance between the old and new approach. The new approach aims at a more egalitarian style of governance as compared to the old approach, and aims at a more balanced weighing of interests. It was noted that the new approach of 'retention, storage, drainage' falls in the category of ecological modernisation. Truly structural solutions to the issues of water quantity management (such as radically adapting land use to the hydrological situation) do not pass the 'concordance criterion' and are no issues on the political agenda.

The insights retrieved from this section about the nature of the issues and the nature of (different types of) policy approaches to these issues will be used as background information for analysing the arrangements addressing these issues involving economic steering instruments or evaluation methods. In section 5.3, two centralistic economic policy instruments will be analysed that may address the issues resulting from sectoral water management as described above by demand management. These instruments are a ground water tax and a surface water tax. In section 5.4, decentralised arrangements for addressing issues related to water systems quantity management will be analysed. As was explained earlier, the arrangements in which these instruments are used focus on supply management.

In section 5.5, I will discuss different approaches to river flooding, resulting from different paradigms. Issues related to river flooding were not (directly) caused by a sectoral approach to water management. However, the fact that these issues have been addressed in a technocratic manner for centuries has also created a number of substantial negative side effects. A new approach to river flooding related to the room for water approach to fight local and regional water nuisance aims to mitigate and prevent these negative side effects.

5.3 GOVERNANCE ARRANGEMENTS FOR WATER SYSTEMS QUANTITY MANAGEMENT INVOLVING CENTRALISTIC ECONOMIC INSTRUMENTS

5.3.1 INTRODUCTION

This section discusses two centralistic economic steering instruments in water quantity management, addressing two separate issues, namely ground water use and surface water use. With regard to the first issue, an economic policy instrument is already in place (the ground water extraction tax). In the second issue, no economic policy instrument is in place (yet). However, recently, the discussion whether or not such a tax should be introduced was restarted. As we have seen in chapter 4, some other EU-member states did already introduce a surface water extraction tax. Describing the discourse about a policy arrangement for addressing surface water extraction via a tax is expected to yield insight into factors that obstruct its introduction in The Netherlands.

5.3.2 GROUND WATER EXTRACTION TAX

GROUND WATER USE AND POLICY IN THE NETHERLANDS

In the discussion of issues in sectoral water management in the previous section, it was shown that the extraction of ground water for several purposes has caused a number of undesirable effects. Ground water extraction in the dunes for the preparation of drinking water has speeded up salinisation in the polders close to the dunes, and ground water extraction for various purposes in higher areas has caused desiccation due to a lower ground water table and a reduced seepage at the feet of elevated areas. In order to reduce the negative side-effects of ground water extraction, a number of policies have been introduced in the past, varying from CAC-instruments (prohibitions and permits) to economic instruments influencing demand. For example, drinking water companies in 'desiccation-sensitive' areas have been forced to switch from using ground water to using surface water for the preparation of drinking water. Besides the fight against desiccation, another reason for this switch is the goal to have strategic drinking water reserves in the ground in case of emergency, such as the emission of radiation from a nuclear power plant, as happened with Chernobyl, or terrorist attacks.

STAKEHOLDERS

A consequence of the switch to surface water for the preparation of drinking water is that in some areas, drinking water prices have increased, since the preparation of drinking water from surface water is much more expensive than preparation from ground water¹³². Drinking water companies forward the higher purification costs to their customers. Therefore, consumers of drinking water are the main actors paying for the change in policy. Whether or not these higher prices for drinking water are 'justified', depends on the relative valuation of the utility derived from various purposes of ground water use under different policy alternatives. In the 'old' arrangement, in which the negative effects of the use of ground water in the form of desiccation of nature were not expressed in the price of the natural resource and derived products, such as drinking water, the stakeholders benefiting were consumers of drinking water and actors extracting ground water for various purposes. Both groups incurred low costs for satisfying their needs. The 'stakeholders' suffering from the old situation were nature (and those enjoying it or making use of its products and services) and potentially society at large, in case of a radioactive calamity or the like, affecting surface water reserves. In the 'new' approach, the stakeholders benefiting and suffering have, roughly speaking, been reversed.

Besides the actors mentioned above, some additional group of actors can be identified that suffer from the new situation. In some places, the reduced extraction of ground water has led to the surfacing of ground water (seepage). For example, this is the case in towns where large industries used to extract substantial amounts of ground water for manufacturing purposes. Nuisance from higher ground water tables has also occurred in the coastal zone, where a reduced extraction of ground water in the dunes for drinking water purposes has led to seepage of ground water inland. It is likely that these two situations will have to be addressed in different manners. In inland areas where the extraction of ground water by industry was reduced, the surplus in ground water reaching the surface can probably be used for economic purposes, as long as the extraction of this water does not lead to a drainage of ground water reserves and consequently a lowering of the ground water table and possible desiccation elsewhere. In urban areas suffering from this phenomenon, water managers are faced with a *fait accompli* with regard to land use functions (namely urban area). Therefore, water management will have to be adapted to this situation. In the strip along the coast (*binnenduinrand*) where ground water is surfacing, large scale extraction of ground water to prevent this problem will probably have strongly negative effects in the long-term due to salinisation. Here, adapting the living environment to the situation of seepage (for example by not building houses with cellars) would be a more structural (and thus more sustainable) approach. Possibilities for this are better than in inland urban areas, since land use functions can be more easily changed. Besides, the urgency to do so is larger in the coastal zone. In inland urban areas, the risk of salinisation is less of a problem, since the fresh ground water layer on top of the salt ground water is much thicker. In section 5.2, a number of new

¹³² Water ending up in deeper ground water layers has usually gone through a process of purification of decades or even centuries in its transport from the surface to the ground water layer. In contrast, surface water usually contains high concentrations of undesirable elements. Therefore, the process of purification of surface water for the purpose of drinking water usually requires more, more complicated, and (thus) more energy-consuming purification techniques and as a consequence is more costly.

planning instruments were discussed that aim to incorporate water related aspects of spatial planning in the planning process and that apply to such situations as described above. Considering the rise of new problems as a consequence of measures to fight desiccation by reducing ground water extraction, one might reconsider the use of ground water for certain high value applications, such as drinking water, in areas where the abundance of ground water does not lead to desiccation or salinisation.

GROUND WATER TAXES IN EU MEMBER STATES

With regard to desiccation by ground water extraction (and ground water resource management in general), ECOTEC et al. (1999) studied the application of water abstraction taxes or charges (for both ground and surface water extraction) in EU Member States. According to the report, abstraction permits represent a natural resource endowment, which may justify an accompanying payment to the entity that controls property rights. Still, abstraction taxes are relatively rare in the EU member states, and where they exist, they often reflect administrative payments. Nevertheless, abstraction charges, other than administrative fees, have been used for several decades in France and Spain for the financing of river basin management. The charge revenues are used for water management activities and administrated by special purpose agencies in water management. More pure abstraction taxes with a fiscal function have been in operation at regional level in Germany, and have been introduced at the national level in Denmark (in 1993) and The Netherlands (1995). The two more recent tax schemes (The Netherlands and Denmark) differ considerably in scope and effective tax rate. While the Dutch tax is relatively low, it does not exempt industry. The Danish tax is quite high, but applies to households and some service business only. Both taxes exempt agriculture. The taxes have been introduced as part of a greening of the tax system, and do not rely on any valuation of the environmental pressures from water abstraction, but may be seen to have significant incentive effects on ground water extraction after all (ECOTEC et al. 1999: 66).

The fact that the taxes do not rely on any valuation of the environmental pressures from water abstraction is demonstrated by the decision to exempt agriculture. This sector is namely one of the major water extracting sectors. The exemption results in a *de facto* subsidising of agriculture by the sectors that do pay a water extraction tax, such a household (private use), drinking water companies, industry and other businesses. These taxes therefore do not meet the criterion of equity from the perspective of an equitable distribution of the tax burden among categories of stakeholders. As long as the tax does not rely on any calculation of the environmental pressures resulting from water abstraction and as long as exemptions are in place, it probably does not contribute to a real 'greening' of the tax system. Besides, in that case, it is not a water management instrument that meets the requirements of integrated water management.

THE DUTCH GROUNDWATER TAX

The Dutch tax applies to the abstraction of ground water by water works or by other entities (industry; agriculture) and aims to protect the scarce ground water resource in the Netherlands, which is the source for 70 per cent of the total water supply for drinking water

preparation. The tax applies to 'fresh ground water', which is defined as water with less than 300 milligrams of chloride per litre. It should be emphasised here that according to an interviewee at the Ministry of VROM, the motive for installing a ground water tax has changed over time. Initially, the ground water tax was considered within the framework of greening the tax system. Dessication of nature was the environmental impact of ground water extractions that was used to legitimise a tax within this framework. However, the direct link between the ground water extraction tax and the mitigation of dessication proved to be hard to establish. Therefore, according to this interviewee, other legitimisations for the tax were sought for. These were found in the protection of ground water as a strategic reserve for the preparation of drinking water.

The standard rate of the tax is 0.15 EUR per cubic meter of water. This standard rate applies to water companies. For other abstractions (industry, agriculture), the original rate was 0.08 EUR/m³. The reduced rate of 0.08 EUR/m³ applied to industries and agriculture undertaking their own abstraction. From 2001 onward, industry was made to pay the higher rate. Even at the reduced rate, the price increased to more than 100% for self extracted ground water relative to the costs of extraction (Vermeend and Van der Vaart, 1998: 36). Industries that are supplied by water companies using ground water for their drinking water preparation, became affected by the tax, which was passed on. This was also the case for other economic sectors (e.g. households) being supplied by water companies. The fact that at first both industries and agriculture, and later on only agriculture, were allowed to pay a reduced price shows that the tax system did not lead to an equitable distribution of the tax burden.

The following uses of ground water are exempted from the tax (Vermeend and Van der Vaart, 1998:37):

- sprinkling and irrigating land, if less than 40,000 m³ per year is extracted, meaning that in practice agriculture is more or less completely exempted;
- draining of building sites, if less than 50,000 m³/month is extracted for less than 4 months;
- small pump capacity (less than 10 m³ per hour);
- sanitation of polluted ground water;
- emergency extractions (e.g. fire department, etc.);
- extractions for skating rinks;
- draining and mining (at depths greater than 500 meters).
- companies using ground water to rinse packaging.

The reasons for some exemptions seem obvious, since they are essential for safety reasons (emergency extractions), non-structural in nature (draining of building sites), necessary for environmental reasons (sanitation of polluted ground water) and/or will not have a substantial effect on ground water reserves (small pump capacity). Other exemptions, however, seem less obvious, such as sprinkling and irrigating land, extractions for skating rinks and draining and mining. Companies using ground water to rinse packaging are exempted since reuse of packages is considered more environmentally friendly than using new packages for every product cycle. It can, by the way, also be argued that small pump capacity extractions should not be exempted either, since the combined extractions by small pumps may have a substantial effect on ground water reserves. In 1998, the Green Tax

Commission recommended increasing the reduced rate for industry and agriculture to the level of the standard rate (Ministerie van Financiën, 1998: 13).

The tax was originally proposed in 1992, as part of the new Environmental Taxes Act. It is mainly a fiscal tax, aimed at raising revenue for fiscal reform. However, the tax does also have the purpose of curbing the use of groundwater. The tax applies to the extraction of deeper layers of ground water. Both with regard to water abstraction by water companies, and in the case of other abstractors, self-monitoring is in place, with sample control. Control of the ground water extractions is performed by provincial authorities, which are the public authorities responsible for ground water management. The ground water tax is supplementary to the basic system of abstraction licenses (ECOTEC, 1999).

With regard to environmental effectiveness, ECOTEC et al. note that the exemptions and reduced rates in place, addressing mainly industry (e.g. the exemption related to small pumping capacity of 10 cubic meter per hour) and agriculture, have considerably reduced the (potential) environmental effectiveness of the tax by creating room for environmentally adverse practices. For example, the pumping capacity exemption created a perverse incentive for farmers to use several smaller pumps instead of a few large ones. By applying this strategy, the total volume extracted could remain the same.

5.3.3 DESCRIPTION OF THE SURFACE WATER TAX AND COMPARISON WITH THE GROUND WATER TAX

As was shown in chapter 4, a number of EU-countries have installed a tax for the extraction of surface water. In The Netherlands, no such tax has been installed. Therefore, no discription of the governance arrangement regarding this instrument can be given here. However, the decision-making process about the implementation of the instrument is very relevant for the purpose of this thesis as well. Information about this process was mainly derived from interviews and news articles.

An interviewee at the Ministry of VROM indicated that the reason for not implementing the surface water extraction tax is a quite straightforward one. According to this interviewee, the surface water extraction tax was studied in the same period and within the same framework (the greening of the tax system) as the ground water extraction tax. The ground water extraction tax was motivated by the initiators (ministries of VROM and Finance) from three perspectives: fighting desiccation, creating a strategic ground water reserve for calamity situations, and greening of the tax system, based on the user pays principle. The surface water tax was not specifically linked to either desiccation or strategic reserves, but was motivated from the perspective of greening the tax system, also based on the user pays principle (motivated from a general notion of efficient use of natural resources). The 'environmental effect' that legitimised this perspective was deterioration of surface water quality in dry periods by both the deterioration of the local water itself (higher concentration of pollutants, salt, algae, etc.) and by inlet of water of a different composition to flush the water system to remove contaminating substances and salt, as described earlier this chapter. In the period in which the various 'green taxes' were studied, desiccation was a prominent policy issue. No explicit link was made between surface water extraction and dessication. Therefore, the need to curb ground water extraction (for which the link was

made) was felt more strongly than the need to curb surface water extraction. Other arguments against the reduction of surface water shortage via a surface water extraction tax are that supply management instruments at present are considered more (cost-)effective to curb the shortage of surface water and the fact that a surface water extraction tax is a permanent and generic instrument, while surface water shortage is often a local and/or temporary phenomenon. These arguments are supported by a general notion of abundance of surface water in The Netherlands. Since for centuries, water quantity management had been mainly occupied with dealing with an excess of water, the idea that a shortage of water could be a problem did not exist in the mind set of water managers and land users. Somehow, advocates of regulations for ground water extraction had managed to get this issue on the political agenda, while advocates of regulations for surface water use so far have not. The regulation by means of CAC-instruments of surface water extraction for certain use in dry periods was considered sufficient to deal with what was considered a incidental problem.

Besides the reasons mentioned above, pragmatic considerations play a role as well. A ground water extraction tax would be easier to implement and monitor, since one of the major ground water users (drinking water companies) already kept a detailed record of extraction figures. Property rights for surface water in general are much more difficult to delineate and enforce than property rights for ground water. For example, the monitoring of surface water extractors would be much more difficult, since one of the major groups of surface water extractors (farmers) is much more dispersed and diverse than drinking water companies with regard to ground water extraction. A third reason not to implement the surface water tax is related to the general policy to shift from ground water to surface water use for various activities. This factor can be shared under the 'concordance' criterion. As was mentioned before, one of the policies to reduce ground water extraction was to force drinking water companies to shift to surface water for drinking water preparation. The main policy instrument to achieve this shift were permits. Raising a tax on surface water extraction would even increase the price difference between drinking water prepared from ground water and that prepared from surface water. This was considered undesirable from the point of view of equity between regions. This resulted in the political decision not to install a surface water tax.

As was described before, the dominant discourse in Dutch water policy with regard to water systems quantity management is that of a spatial approach to enhancing supply rather than reducing demand. A surface water tax is not part of this discourse. Recently, however, the discussion about a surface water extraction tax has resurfaced in the discussion about implementing the EU WFD. As was discussed in chapter 4, this directive, in Annex VI, Part B, states that 'Member States within each river basin district may choose to adopt supplementary measures as part of the programme of measures' to implement the WFD. This list of supplementary measures includes 'economic or fiscal measures', 'demand management measures' and 'efficiency and reuse measures' (see also the previous chapter). This passage provides public water management authorities in Member States with the legitimisation to consider a (vast) range of policy instruments in water management, including a surface water extraction tax, which could contribute to the recovery of the costs of water systems management. Such a surface water extraction tax would require an amendment of laws regulating surface water use.

FORMAL INSTITUTIONS

With regard to surface water extraction from primary systems, the *Wet op de Waterhuishouding* (Water management act, Article 12) states that in certain situations, extractors (or dischargers) have to notify the relevant authority and in some cases also have to measure the amounts extracted or discharged. Notification is often required above certain volumes, and measurement is only necessary in case the extracted quantity has a crucial influence on the functioning of the relevant water system. Since the capacity of regional systems is smaller than that of the primary, national system, permits for extraction from or discharge into these systems are more common. With regard to extractions and discharges in (the vicinity of) vulnerable areas and with regard to extraction by agriculture, a permit policy is in place to reduce desiccation. The criterion for appointing the permit obligation to a specific (legal) person is the expected negative influence of extraction on water level regulation and water flow directions, or the necessity for special management measures (Teeuwen, 1995). These situations, however, do not occur very often. So whereas actors that are endowed with surface water can in principle be made to pay fees for a permit, the number of situations in which a permit is required is limited. Besides, no tax exists on use within the limits of the permit (so no dynamic incentive is provided). It must be noted in this respect that just as is the case for ground water extraction, a large number of extractions that fall outside the regime of a permit or levy can have a substantial combined effect.

DISCOURSE

The discussion of the extraction taxes in the previous sections showed that the issue of desiccation of nature due to ground water extraction is more prominent on the political agenda than issues (including desiccation) related to surface water extraction and drainage. The likely reason for this is that ground water is perceived as a much more relatively scarce, valuable, strategic and non-renewable resource than surface water. As a consequence, the permit policy regarding ground water extraction is much more strict than that regarding surface water extraction. As a consequence, surface water is regarded and treated much more like a free good than ground water. The dominant normative discourse with regard to ground water is demand management (limiting ground water use), whereas that regarding surface water is supply management (increasing supply), through the triptych 'retention, storage, drainage', in line with the advice of the Commission Tielrooy (see Commissie Waterbeheer 21ste Eeuw, 2000). The supply management approach to surface water is, amongst others, considered more cost-effective than a demand management approach. Generally speaking, negative economic incentives (such as taxes) better fit demand management than supply management.

According to a drinking water specialist at the Ministry of VROM, the total burden on the environment by preparation of drinking water from surface water is higher than the preparation of drinking water from ground water. In order to compare the environmental burden of these two preparation processes, a Life Cycle Analysis (LCA) would have to be performed. The result of such an analysis could be that from an economic and environmental point of view, drinking water preparation from ground water may in some cases be preferable to preparation from surface water. Scientific knowledge about the life cycle burden on the environment and associated societal costs seems crucial for making this decision.

However, as was discussed before, valuation of the economic costs of environmental effects is always a debated process. It seems that, keeping uncertainties about the scientific knowledge in mind, the dominant normative discourse with regard to ground water extraction and desiccation is to apply the precautionary principle. This principle best fits the policy paradigms of eco-development and deep-ecology, since the principle does not allow for substitution of natural by man-made capital and therefore not for market based allocation. However, the question is whether in the case of ground water extractions, the chosen approach to switch to surface water as a resource for a number of applications is most in line with the starting points of integrated water management. As was indicated before, integrated water management (amongst other things) means the balanced weighing of interests. The switch to surface water has led in some places to substantial negative side-effects in terms of water nuisance. Besides, as was indicated before, this choice has substantially increased purification costs. Therefore, this strict approach may not be very balanced. It may be more sustainable from an economic, social and even environmental perspective to use high quality ground water for a (strictly limited) number of high value purposes.

5.3.4 SUMMARY

The arguments used for introducing a ground water extraction tax were a combination of policy goals: the fight against desiccation, having a strategic ground water reserve (self-sufficiency) and the greening of the tax system. Reasons for not introducing a surface water tax so far are a perceived abundance of surface water (and therefore a lack of a perceived need for the regulation of surface water extraction), the dominant normative discourse of supply management, the obstruction of a strategic shift towards surface water use, issues of equity and fairness and practical obstacles for the enforcement of a surface water extraction tax (no clearly defined property rights and sensitivity to fraud). An important obstacle for the allocation and use of ground and surface water based on 'economic sense' is the (scientific) uncertainty about the economic value of the environmental effects of preparation of drinking water from surface water and ground water. Whereas environmental impact analysis (based on Life Cycle Analysis) may show that the preparation of drinking water from ground water may in fact be more environmentally friendly, the uncertainty about the magnitude (and economic value) of the environmental effects of both approaches, combined with the higher position on the political agenda of issues related to ground water, has resulted in the protection of ground water by means of the application of the precautionary principle and related policy approaches and instruments. This shows that the dominant discourse (and paradigm) is risk avoiding. Besides, this approach is defensive in nature, which may indicate that no paradigm shift has taken place yet towards eco-development, in which a holistic, systemic approach towards natural resource use is strived for. The analysis of the (discourse about) ground and surface water extraction taxes showed that obstacles for the introduction of a surface water tax originate from a range of elements of the analytical framework, such as the dominant ontological discourse that ground water use causes environmental problems and surface water use does not, the optimality criterion, the concordance criterion, a misfit with the dominant policy paradigm towards the man-nature relationship and the resulting dominant normative discourse (pre-cautionary principle, supply management).

5.4 SPATIAL APPROACHES TO SURFACE WATER QUANTITY MANAGEMENT AT THE REGIONAL AND LOCAL LEVEL

5.4.1 INTRODUCTION

In the previous section I discussed economic demand management instruments aimed at mitigating negative side-effects of sectoral water management. In this section, I will discuss a number of approaches aimed at the prevention of negative side-effects of water use by enhancing the buffer capacity of water systems in a quantitative sense. By enhancing supply, the situation of scarcity is alleviated, and market-based instruments become less suitable and necessary. This strategy enables to circumvent the sensitive debate about the choice between applying the Standard or Extended Polluter/User Pays Principle and the related redistribution of property rights. As was indicated earlier in this chapter, in recent years, new approaches to water systems quantity management were introduced. An important aspect of these approaches is the fact that water is receiving increased attention in spatial planning. In both rural and urban areas, the concept of the 'value of water' is playing an increasingly important role in this respect. Whereas water was previously regarded as valuable for a limited number of its functions and services, in recent years the scope of this concept has widened substantially. In sectoral water management, the value of water for agriculture, for transport and for drinking water were the main concerns. In recent years, the value of water for recreation, as an appreciated element in landscapes, for nature and the value to society of several regulatory functions of aquatic ecosystems has started to play a role as well, resulting in new coalitions and arrangements. In subsection 5.4.4, a description will be given of economic aspects of the relation between water and spatial planning in rural and urban areas. In subsections 5.4.5 and 5.4.6, two types of spatial arrangements in the practice of Dutch water management will be analysed, namely blue service-arrangements and public private partnerships, respectively. In subsection 5.4.7, a summary will be given of the findings in this section. First, however, a more general overview will be given of macro-level developments leading to changes in the position of water in spatial planning (subsection 5.4.2) and an account of the development of policy arrangements for water and spatial planning from a scientific perspective (5.4.3).

5.4.2 DEVELOPMENTS RELATED TO POLICY FOR THE PHYSICAL ENVIRONMENT

In chapter 3, a description was given of possible categories of impulses for change in policy arrangements for water management. Wiering and Immink (2003) discuss the influences of each of these categories on policy arrangements for water and spatial planning. This subsection mainly addresses changes in scale and governance (which may alter social relationships in terms of political modernisation). These types of impulses can be shared in the category of exogenous factors as described in the analytical framework. Impulses for change at the meso-level will be discussed in the next subsection (5.4.3).

CHANGES IN (THE SCALE OF) GOVERNANCE

With regard to changes in scale, on the one hand, Wiering and Immink distinguish a tendency in policy regarding the physical environment towards area directed or area specific approaches (Van Tatenhove, 1993; Van der Vlist, 1998, Wissink, 2000; De Roo & Schwartz, 2001). On the other hand they observe a tendency for internationalisation of policy. This tendency is, amongst others, expressed in the content and implementation of the Water Framework Directive. At national level, Wiering and Immink (2003) also expect major changes in the organisational structure of water management in the short term, partly due to policy formulated at EU-level. Whereas the national policy agreement on water (*Nationaal Bestuursakkoord Water*), agreed in July 2003, is largely based on existing allocation of tasks and planning structures, they think that river sub-basin visions and, from 2009 onward, river sub-basin management plans may bring along substantial organisational changes.

Besides changes in scale of policymaking, the authors also distinguish a societal change in the perception of governance, which is often indicated as a shift from *government* to *governance* (see also Janssens and Van Tatenhove in this section and Van Tatenhove et al. in chapter 3). For spatial planning, this means that the traditional *facetkader* (facet-approach), in which spatial planners aim to balance the claims for space by different societal and economic sectors in a justified way (making use of instruments for *toelatingsplanologie* (permissive spatial planning), is changed into a development planning-approach with a pro-active and interactive character (*ontwikkelingsplanologie*). Problems will no longer be defined in a generic sense, but will be defined and tackled as an area-specific issue by a network of actors. This development will increase the importance for various actors of gaining a good position in the negotiating process about spatial developments, since spatial planning will become the result of negotiations rather than an 'objective' balancing by 'independent' spatial planners in government organisations¹³³. The shift from 'permissive spatial planning' to 'pro-active spatial planning' was initiated at the national level by the publication of the *Nota Ruimte*¹³⁴ (Ministry of VROM, 2004), which explicitly bases spatial planning in The Netherlands on this *ontwikkelingsplanologie*, whereas previously, spatial planning policy was based on *toelatingsplanologie*.

For water management, Wiering and Immink also expect a gradual change from a national-sectoral policy towards a regional, area-specific policy. According to them, the recent reorganisation of water boards into larger, more powerful organisations based on the geographical area of river-subbasins, allows water managers to play an important role in this new approach. Besides this shift towards regional, area-specific policy, they expect the persistence of the sectoral policy arrangement of 'water defence', dominated by the national

¹³³ Off course, private actors also had developed various ways of influencing the decision-making processes in the old approach. The difference between the new and old approach is that in the new approach, organisation and content of the negotiating process is (intended to be) more transparent. Besides, the composition of arrangements in terms of actors involved may differ for each issue. Therefore, stakeholders will have to be more pro-active in monitoring spatial developments in order to make sure they are represented in various arrangements.

¹³⁴ The *Nota Ruimte* is the latest white paper on spatial planning, which replaces previous white papers on spatial planning, such as *Vijfde* (the fifth white paper on spatial planning).

government. In other words, with regard to the issue of water defence, Wierink and Immink expect no room will be given to holistic planning concepts incorporating water defence besides other land use functions and water defence policy will remain regulated strongly by the central government. Wiering and Immink argue that the interactions between 'new' and 'old' policy arrangements are important points of attention in studying Dutch water management. According to them, more open forms of interaction will be needed since actors in the regional or local areas have various resources at their disposal, such as diverging knowledge, competencies, ownership of land and other, which may be needed for (successful) implementation of new arrangements. This will result in more horizontal relationships between the actors in area-specific policy arrangements. The tailor made, area specific economic approaches to water quantity related issues as described in this chapter are examples of such arrangements. Section 5.6 will analyse whether or not there is room for new approaches in water defence policy and management.

5.4.3 SCIENTIFIC DISCOURSE REGARDING POLICY ARRANGEMENTS FOR THE PHYSICAL ENVIRONMENT

In this subsection, scientific views on changes in policy arrangements for the physical environment are discussed. This discourse relates to the meso-level of analysis as identified in chapter 3.

SHIFTS TOWARDS INTEGRATIVE AND HOLISTIC POLICY APPROACHES FOR THE PHYSICAL ENVIRONMENT

As was presented in chapter 2, halfway the 1980s, the concepts of 'integrated water management' and 'water systems approach' were introduced in the document '*Omgaan met water*' (dealing with water) (Ministerie van Verkeer en Waterstaat, 1985). These concepts led to a change in the water management discourse. Whereas previously, the emphasis was on a sectoral approach, since halfway the 1980's story lines using terms as 'integrated approaches' and 'taking account of the effects of measures on the entire (relevant) water system' have gradually become dominant. It was (and is), however, not so obvious how these concepts should be translated into the policy practice of water management. This translation depends on the meaning that is given to the concepts by different (groups of) actors in the policy field and the power balance between these actors.

In a contribution to Van Tatenhove et al. (2000) about green planning¹³⁵ in The Netherlands, Janssens and Van Tatenhove state that the concept of green planning has recently incorporated a range of initiatives, including a range of plans and strategies related to the broader issue of sustainable development. With regard to these initiatives, Dalal-Clayton (1996: 3) states: 'so far, very few countries have tried to find a balance between environmental, social and economic interests - a central precondition for a development towards sustainable development'. According to Janssens and Van Tatenhove, every country exhibits different policy arrangements and customs with regard to policymaking for the

¹³⁵ Many definitions of green planning can be given. One such definition is 'plans developed, mainly in industrial countries, to address escalating environmental problems' (Dalal-Clayton, 1996).

realisation of sustainable development. Green planning therefore appears to be a generic term that can be operationalised in many ways¹³⁶ (Janssen & Van Tatenhove, 2000: 145). The same contention could be made for the concept of integrated water management. This concept too seems to have emerged from an increased attention for 'broader issues of sustainable development' in the policy arena of water management. At various levels in the policy (and management) field of water, different policy arrangements and policy practices can be applied to give substance to the concept of integrated water management as an equivalent for sustainable development in water management. This trend of attention for 'broader issues of sustainable development' in the policy arena can be shared under the general trend in society of ecologicalisation, as identified in chapter 3.

Water management is one of the (institutionalised) policy domains that have the physical environment as their planning object. In order to attain sustainable development, thus far fragmented policy initiatives for the physical environment need to be integrated. Zonneveld (1991) states that the formal object of 'green planning' includes the institutional dimension, which means the ability of government and other organisations to steer and to realise sustainable development. In other words, Zonneveld argues that without (clear) policy no sustainable development can be attained. The same can be said with regard to integrated water management. Reasons for government intervention in this respect were already discussed in chapter 2. Janssens and Van Tatenhove further state that spatial planning encompasses a large variety of initiatives that vary in reach, status and effect. With regard to the Dutch situation, these initiatives especially relate to integrated planning (*integrale planning*), which on the one hand refers to initiatives to integrate policy plans of various policy domains and on the other to types of co-operative planning at the regional level. The integration of policy (plans) of various policy domains (and that of plans of various government levels) was the initial focus of attention during the introduction of the concept of integrated water management. Giving shape to integrated planning (including integrated water management) is the focus of attention in this section and the following ones.

In Dutch debates about spatial planning, discourses about integration and governance play a large role. The dominant discourse about integration refers to the integration of policy domains that have the physical environment as their policy and planning object, such as spatial planning, environmental policy and water management (referred to as horizontal integration in chapter 3). In this thesis so far, the focus has been mainly on the relation between environmental policy and water policy. Partly, this was the logical result of an emphasis on describing economic instruments for environmental policymaking in chapter 3. For a substantial part, however, this also resulted from the fact that this relation has been given much more attention in the 1980's and 1990's than the relation between water and spatial planning. 'Environmental elements' were already incorporated into water policy resolutions in the '80s and '90s of the previous century and simultaneously water quality issues were addressed in environmental policy resolutions. The attention for the relation between spatial planning and water management is of relatively recent date and was triggered by the near floods (shock events) in the 1990s and early 2000s. The importance of paying attention to water systems in spatial planning was mentioned explicitly for the first time in the fifth white paper for spatial planning (*Vijfde*), which was issued in 2001 (Ministerie

¹³⁶ In The Netherlands, such a term is often referred to as a 'container term' (*containerbegrip*).

van VROM, 2001). Political attention for the relation between the policy domains of water and the environment is thus older and therefore more institutionalised than that between the policy domains of water and spatial planning.

Wiering and Immink (2003) describe past and present policy arrangements in Dutch water management related to spatial planning. According to these authors, the discourses in water management have developed substantially in the last decades. They state that discourses in water management seem to show more dynamics than those of spatial planning. Until the 1980s, water management was strongly directed at the realisation of the needs and desires that resulted from spatial planning, such as the spatial separation of functions. The normative discourse was dominated by the idea of 'manageability', in which human beings and their spatial and economic needs were given a central position (according to antropocentric policy paradigms). The introduction of the concept of 'integrated water management' in 1985 gradually changed this. According to Wiering and Immink, the 'societalisation' and 'ecologicalisation' of water management have thus been set in motion some time ago. At present, they state, two discourses exist that dominate visions and perceptions of water (quantity) management and that compete to become the dominant discourse: the existing discourse of 'defending land against water' (*water keren*) and the new discourse of 'accommodating water' (*water accommoderen*).

In the new approach, spatial measures are preferred to technical ones. This was expressed in the triptych 'retention, storage, discharge' (*vasthouden, bergen, afvoeren*) introduced by the *Commissie waterbeheer 21ste eeuw* (Commissie Tielrooy) and adopted by the Dutch cabinet. The link between the triptych and the types of measures is that 'retention' and 'storage' are new strategies and 'discharge' is the traditional priority strategy. Discharge according to the old approach usually involved technological measures, while retention, storage and discharge according to the new approach often require spatial measures. As part of the concept 'room for water' (the new approach), water and land use are combined since space is scarce in The Netherlands. This combination of land use for water management with other land use functions forces the policy domain of water management to change from a relatively closed and independent, sectoral policy domain to an open domain that depends on other (public and private) actors and on (policy) approaches in adjacent policy domains. This means a continuing 'societalisation' of water management (and thus a different culture among water managers), opportunities for new policy coalitions with organisations such as environmental protection, nature conservation or recreational development and new policy arrangements, such as 'blue services' and public-private partnerships (see later in this chapter). Wiering and Immink (2003) argue that the generation of knowledge is an important precondition for policy development according to the new discourse. In order to support this new discourse, 'water management as a societal issue' therefore needs more scientific embeddedness. Scientific information is thus an important resource for advocates of this discourse.

Janssens and Van Tatenhove (2000) discuss two strategies that were used to realise an integrated policy for the physical environment. The first strategy focuses on the integration of planning systems and plans, especially at the provincial administrative level. The second strategy for the realisation of integrated policy for the physical environment incorporates the introduction of unofficial ('extra-judicial') policy experiments. Central in these experiments is

the voluntary co-operation and co-ordination between public and private actors (diagonal integration, see earlier this chapter) and the integration of policy approaches to similar issues by different policy domains. Examples mentioned by Janssens and Van Tatenhove (2000: 158) are the experimental projects 'integrated region-oriented policy' and the 'water systems approach'. The 'blue service'-arrangements and public-private partnerships that will be discussed later this chapter can also be shared under such experiments.

INSTITUTIONS FOR WATER MANAGEMENT AND SPATIAL PLANNING

Compared to spatial planning, water management has a differentiated system of rules of the game, laid down in a.o. the Water management act (*Wet op de Waterhuishouding*), the *Waterstaatswet*, regulating the organisational structure of water management, the Ground water act (*Grondwaterwet*), the Water defence act (*Wet op de waterkering*) and the Surface water pollution act (*Wet verontreiniging oppervlaktewater*). Besides, water management has a separate and relatively autonomous functional layer of governance, with its own competencies: water boards. Wiering and Immink mention as important resources for water management authorities specialist technical knowledge and know-how and decision-making authority assigned to this functional government layer. The costs and benefits of water management in principle are spread evenly over groups in society. Therefore, according to Wiering and Immink, water management at present is characterised by a political environment that can be typified as 'majoritarian politics' (Wilson, 1989)¹³⁷. It can be argued that in sectoral water management the political environment can be referred to as 'client-politics' (see footnote). A situation of majoritarian politics is one of the central goals of integrated water management. However, 'client-politics' will probably prove to remain quite persistent for some time in the future. This expectation can be explained by the notion that 'client-politics' has been embedded (institutionalised) in a large number of informal (habits, beliefs, views, convictions, ontologies) and formal institutions (rules, legislations, organisations). Advocates of this 'client politics'-approach will try to accommodate and manipulate the new discourse of integrated water management in such a way as to give it meaning within the existing institutional setting.

Wiering and Immink (2003) identify the changing relationships between policy domains as an impulse for a change in policy arrangements. With regard to the relationship between water and spatial planning, they state that this change operates both ways. On the one hand, this involves a changing place of water management in spatial planning (more room for water) and on the other hand the influence of other policy domains on the functioning of water management (societalisation). An important instrument with regard to the latter is the development of the process instrument *watertoets* for spatial planning procedures, which

¹³⁷ Wilson (1989) gives an overview of the functioning of functional public organisations. He distinguishes four types of political environments for such organisations, based on the variation in the dominance of constellations of interests and the distribution of costs and benefits of policy (Wilson, 1989: 76-78). Client politics, for example, is an environment in which dominant interest groups exist that greatly benefit from the regulative programme, while costs of this programme are spread. In this situation, the risk of 'encapsulation' of the public organisation by these dominant interest groups is quite substantial. In contrast to this situation, in majoritarian politics, no very dominant interest group(s) exist. Both costs and benefits of the public programme are spread among various interest groups.

aims to change the relationship between (spatial aspects of) water management and spatial planning. Before one can speak of 'new policy practices', however, a number of obstacles have to be overcome. Firstly, the role of water managers changes as a result of the *watertoets* from a traditional 'testing' role in a late stage of decision-making, towards a proactive role in an early phase of spatial planning. Water managers have to become accustomed to this new role. In the discourse-dimension a number of obstacles emerge as well: in spatial planning, good water management is seen as one of the many conditions for good spatial planning. In principle, the aspect of 'water' is not given priority over other relevant aspects, such as environmental quality, liveability or economy. At most, water is a 'co-structuring principle'. In water management, however, the dominant discourse is that water should be regarded as '(one of) the main structuring principle(s)', even as a necessary precondition for good spatial planning. The style of governance differs as well: spatial planning thinks on the one hand in procedures and on the other in concepts, often wrapped up in metaphors (buzz-words). Water management often thinks in terms of fixed, 'measurable' civil-technical norms and standards¹³⁸. In short, both the normative and the ontological discourse differ between water management and spatial planning (Wiering and Immink, 2003), and this may hamper integration of these policy domains.

MUNICIPALITIES AS IMPORTANT NEW ACTORS IN SPATIAL APPROACHES TO WATER MANAGEMENT

The changes in the normative discourse about (spatial) water management are also reflected in the involvement of new stakeholders. Especially with regard to spatial planning and water quantity management related measures, an increasingly important role is ascribed to municipalities. These public organisations, however, still have to get used to the new role in water management assigned to them. Previously, they were mainly concerned with managing the sewer system and using water as an aesthetic or connecting element in urban planning. Combining these tasks and functions with structural water quantity related measures is new to them. Many municipalities are still reluctant to take this aspect of water management in their portfolio and only perform those tasks for which they have a legal responsibility, at least as long as they are not given the legal instruments to finance these new activities¹³⁹. Other public authorities stimulate municipalities to advance on this. For example, the central government and provinces stimulate the drawing of municipal water plans. Besides, increasingly, municipal development plans (and all other spatial plans with legally obliged procedures) are tested on their hydrological and other water related impacts by means of the *watertoets*. The performance of a *watertoets* and the inclusion of a '*waterparagraaf*' in municipal zoning plans has become legally obligatory in 2003. Besides the administrative instruments mentioned, municipalities could be stimulated to engage in water management by economic instruments as well. For example, subsidies can be

¹³⁸ Discourse (and story lines) seem to be more important in spatial planning than in (traditional) water management. However, with the shift towards integrated water management and the internationalisation of water management, concepts (and thus discourse) have become important in water management as well.

¹³⁹ The *Wet verbreding gemeentelijke watertaken* ('Act on the enlargement of municipal water tasks'), which will expand the possibility for municipalities to generate financial means via the sewer charge to finance new municipal water related activities, is expected to be issued in 2007.

provided to municipalities by other public authorities for (pilot) projects to make water a 'planning principle' (guiding element) in urban development or to take measures to retain or store water. Another example of an economic approach is making the (added) value of water systems for the living environment more explicit. Examples of this approach are described in this chapter, amongst others with regard to the *Blauwe Stad*-project.

5.4.4 ECONOMICS IN SPATIAL APPROACHES TO WATER MANAGEMENT ('ROOM FOR WATER')

INTRODUCTION

In recent years, water has received increased attention in spatial planning, both in urban and in rural areas. A number of factors contributed to this. The direct cause for this attention is the water nuisance in the 1990s on both the national (river discharge) and regional and local scale (local precipitation) and the drought in some summers in the early 2000s. As was mentioned before, the Commission for water management in the 21st century (Commissie waterbeheer 21^{ste} eeuw, 2000) concluded that more room for water storage was needed. Policymakers started looking for possibilities to combine the required pro-active approach to water quantity issues with other developments in both urban and rural areas. An example of such a combination for urban areas is the storage of excess water in urban areas in ponds and lakes, which at the same time can contribute to the amenity value of new housing areas. In rural areas, developments in the agricultural sector and changing needs and desires of the population led to the search for combinations of water management with agriculture, nature conservation and tourism and recreation. The combination of use functions of specific areas for water quantity management and other land-use functions is expected to lead to a more efficient use of the commodity 'space', which is considered a scarce good in The Netherlands. Besides, a more explicit role for and visual presence of water in spatial planning is expected to contribute to the appreciation of the utility (in other words: the value) of (both urban and rural) landscapes for various uses.

Both the scarcity of space in The Netherlands and the expectation that a more explicit place and role for water in landscapes will enhance their value are phenomena that can potentially be dealt with through an economic approach to public policy for spatial planning. Such an 'economic approach' can be understood as a policy approach that reduces the financial burden on public organisations for the realisation of public facilities, such as water management, by making use of the added value of water in spatial plans or by combining the space needed for water with other use functions. In other words, public water managers aim to exploit the benefits of water and water systems and thus reduce the costs of realising water related policy goals. For example, the reduction of the financial burden on public organisations may be achieved by making profitable (private) land use functions (co-)finance water management measures or by using land for water storage that can also be used for other land use functions. This second approach comes forth from the understanding that purchasing land for (public) water management is an expensive strategy, combined with the idea that not all space (i.e. land) needed for water management (mainly water storage) needs to be purchased. Agreements with landowners, which in most cases will be designed as a market-based approach (the landowner gets paid for his service), may lead to a more

cost-effective solution from the perspective of public water authorities and possibly a more efficient solution from the perspective of society as a whole as compared to purchasing land. As a consequence of these ideas, various studies and initiatives have been and are being undertaken to incorporate economic policy approaches in water quantity management. Examples of such approaches are public private partnerships for spatial development projects and paying private landowners for offering blue services.

The idea of 'making' private parties contribute to public management tasks on the basis of contracts already existed in relation to fighting desiccation. In this arrangement, farmers are rewarded for agricultural nature management, for example by compensating reduced yield because of high ground water tables. As a result of the attention for water nuisance and the risk of flooding, this construction is also proposed for retention and storage measures. Local water nuisance and limited water reserves are amongst others caused by a continued hardening of land surface due to expansion of residential areas, business parks and physical infrastructure, resulting in fast drainage of surface water and shallow ground water, and by strict water level control for specific land use functions, such as agriculture. Tailor-made approaches in specific areas (possibly based on contracts between public and private actors) may be feasible for addressing these issues of local water nuisance. Such arrangements can be in the form of a 'blue service', as will be described in the part about 'room for water in rural areas', or in the form of public-private partnership (PPP) constructions (which are applied in both urban and rural areas).

ROOM FOR WATER IN URBAN AREAS

As was mentioned above, water is receiving increased attention in urban spatial planning. This attention derives from a number of interests. Firstly, continued urbanisation leads to an increase in hard surface area, which is causing problems in water quantity management (fast run-off and drainage leading to water excess downstream). Secondly, all kinds of economic and household activities (traffic, sewer overflows, pesticide use for public area maintenance, etc.) cause diffuse and point source pollution of surface and ground water. Besides having negative impacts on aquatic ecosystems, these activities also cause negative externalities on other economic activities (farmers that cannot use surface water as drinking water for their cattle because its too polluted, drinking water for human consumption getting more expensive because of the higher purification costs, etc.). Thirdly, water is increasingly being appreciated in urban planning as an added value (*belevingswaarde*; amenity value) for residential and business areas.

With regard to the value of water for urban areas, it can be said that awareness has raised in recent years. For a long time, water in the urban area was seen as a nuisance and a burden, that had to be 'pushed' out of the urban area as much as possible. Canals were filled up and turned into streets, and rain water was collected and removed out of sight as much as possible, for example via combined sewer systems. Whereas water ways had been major transport systems (both in urban and in rural areas) with an important economic function for centuries, the developments in and focus on road transport marginalised this role in many towns and cities. In many places, open water was only maintained in places where it contributed to the special character of a town or city, or in places where it contributed to a romantic image, such as in parks. In recent years, a combination of developments has led to

a renewed interest for water in urban areas. One of these developments are steadily increasing standards for water quality. These demands originate both from the national and the EU-level.

The notion of 'the value of water' is being picked up and stressed by various categories of actors that have an interest in improving the quality of water systems. These actors include both water managers, other public authorities, non-governmental organisations, water related consultancies, and other private actors. (Local) Water management authorities have an interest in the developments from the perspective of achieving water systems' quantity and quality related policy goals, imposed by higher tiers of governance. Nature and environmental NGO's often have an interest from the perspective of the quality of aquatic ecosystems, which may be improved by the measures discussed, both in the urban area and in adjacent rural areas. 'Other' public authorities may have an interest from the perspective of receiving financial support from higher tiers of governance for programmes to improve the quality of urban areas. This also counts for consultancies that advice about such programmes and project developers and subcontractors that execute them. Project developers have another interest in the presence of water in their development projects, namely its added value to the quality of the project, which is indirectly expressed in the prices of real estate. In general, there is an increasing effort by several stakeholders to exploit the value of water. Besides higher prices of real estate on the water front or near water, water is also seen as a catalyst for tourism and recreational activities. In the *Blauwe Stad*-project ('Blue City') in the province of Groningen (www.deblauwestad.nl), these characteristics are combined in a project to revitalise a rural area. Arrangements in which the the value of water is utilised in spatial development projects will be described in more detail in subsection 5.5.5.

ROOM FOR WATER IN RURAL AREAS

For centuries, water in rural areas has been regulated mainly for agricultural purposes. Increasing intensification of agriculture in the 20th century has led to a very productive agricultural sector in The Netherlands. This intensification has however led to a number of side-effects on society in general and on the environment in particular, some of which are related to water, such as (a) '*normalisatie*' (canalisation) of water ways and sophisticated water quantity regulation, resulting in strongly reduced chances for aquatic ecosystems to become full grown, resilient systems and (b) all kinds of diffuse pollution, such as eutrophication, pollution from pesticides and hormones, etc. These negative side-effects of (water management for) intensive agriculture have led to a demand for a shift towards more sustainable agriculture. This sustainable agriculture would entail a reduced use of fertilisers and pesticides, crops that are more resistant to fluctuations in circumstances, such as water supply, and a more diverse landscape, with a higher tolerance for less or non-productive flora and fauna.

At the same time, other societal developments can be observed asking for a redefinition of the role of water in spatial planning. The Netherlands is becoming more and more a service-based economy (*diensten- of kenniseconomie*). This means that there is increased urbanisation and an ever higher percentage of people working in offices. At the same time, people have more spare time and there is an increasing demand for '*rust en ruimte*' (space and quietness) and for recreational facilities. Space and quietness is searched for in the

direct living environment and in leisure activities further away from home. Both developments create an increase in movement of people. Because of ongoing urbanisation in certain areas, people have to travel larger distances to rural areas for leisure activities. This travelling over larger distances is also induced by more advanced transport systems. All in all, the developments described above lead to increased density of infrastructure. This increases pressure on 'rural space'. The demand for space in the direct living environment also creates a higher pressure on rural space. Instead of having little space in the direct living environment and more public space outside that area, people prefer having more private space (such as their own gardens). This results in living environments with a low density of people per surface unit, and thus a high demand on (rural) space. The increased urbanisation and the increased intensification of buildings and infrastructure in already existing urban areas leads to an increase in run-off from hard surfaces. To prevent this run-off from causing nuisance or even danger, it will have to be retained or stored. This retention and storage requires space as well, further increasing pressure on rural areas in peri-urban areas. Urbanisation also results in a reduced tolerance for water nuisance. To prevent nuisance in urban areas, besides creating retention and storage of water in these areas themselves, this will also have to be done in upstream rural areas. For this purpose, space is needed as well. The demand for space for these purposes may be combined with the demand for 'space and quietness' as discussed before. In other words, the necessary and pleasant can be combined. The discussion above shows that not water but space is the scarce commodity in this situation. Therefore, in economic approaches to the issue discussed above, the allocation of this commodity will take a central place.

INCOMPLETE CONTRACTS IN DUTCH WATER MANAGEMENT

To summarise, a number of developments are taking place that affect the planning and function of rural areas and the role water is to play in these rural areas. Economic developments and the preferences and behaviour of urban employees lead to increased urbanisation of rural areas. At the same time, there is an increased demand for rural landscapes, nature, space and quietness because of an increase in leisure time and appreciation of non-material values. Thirdly, a shift in agriculture is taking place from intensive agriculture based on mono-cultures and a high use of nutrients and pesticides, towards a more extensive agriculture based on more resilient crops and cattle, requiring less additives, but in general resulting in less profitable productive systems. In water management, there is an increased demand for space to retain and store water in rural areas to prevent nuisance in urban areas. Besides, there is a demand for more natural water systems, leading to more resilient and (thus) healthy (aquatic) ecosystems and more nature for recreation. All these developments have led to a search for an optimal use of space in rural areas, and possibilities to accommodate the role of rural areas to shifting demands and preferences. In recent years, the solution is often looked for in the combination of land use functions. Many options for the combination of land use functions exist, such as the combination between water storage and recreation, water retention or storage and nature, agricultural production and (aquatic) nature management and agricultural production and water storage. Two types of arrangements that may enable such combinations of land use are analysed in greater detail in this chapter. First, in subsection 5.5.5, I will analyse arrangements for the combination of agricultural production and water retention and storage, referred to as blue services. Then, in subsection 5.5.6, I will analyse arrangements

for the combination of water management measures and various other functions, such as recreation, nature and housing are discussed in the context of public-private partnerships in spatial development projects. Both 'blue services' and 'public-private partnerships' are examples of non-standard (or 'incomplete') contracts in water management.

NORMATIVE DISCOURSES ABOUT SPATIAL APPROACHES TO WATER MANAGEMENT

Above, I discussed a number of spatial approaches to water quantity management in urban and rural areas. With regard to the feasibility of various new arrangements for spatial water management, it is important to know how various actors view the way 'free' water (water in water systems) should be treated (used and managed). Therefore, in this section, a number of normative (or even paradigmatic) views on the use of 'free' water are discussed. This discussion is related to the water management activity of water storage, since this activity at present is one of the main components of spatial approaches to water quantity management. First, I will discuss various types of water storage. Then, I will discuss the paradigmatic views of a number of policy domains on spatial approaches to water quantity management. Finally, I will discuss three normative discourses about the way to regard water quantity management tasks relative to various land use functions from a theoretical perspective, making use of the dimensions of the policy arrangement.

Types of water storage

Van Bommel et al. (2003) make a distinction between retention and storage. Retention aims at retaining water in the area where the precipitation has fallen. Storage aims to store excessive discharge of water in a river basin to prevent negative effects downstream. In the basic approach to water quantity management as suggested by the *Commissie Waterbeheer 21e Eeuw* (2000), and represented by the tryplich 'retention, storage, discharge', retention has priority over storage. It can be argued that measures aimed at retention of water are more preventative in nature and (thus) more sustainable than measures aimed at storage. Habiforum (2002) distinguishes 4 types of water storage:

- structural building of reserves;
- building of seasonal reserves;
- storage of peak flows;
- emergency storage.

It can be argued that the first two types of storage fall in the category of retention, since they aim at structurally retaining water, to reduce water nuisance downstream in periods of excess water, and to increase its availability in periods of shortage in supply. These measures are preventative in nature. The latter two measures only have a temporary aim of mitigating already existing flood threats and are therefore curative in nature.

Perspectives on water storage as a water service

Water services are described in various policy papers, from different perspectives (water, spatial planning and agriculture). The definition of water services in the WFD was already presented in chapter 4. Whether water storage is a service as defined in the WFD is not exactly clear. Strictly speaking, it is, because it concerns the 'storage of surface water', which is part of the definition. However, the question in this case is who is providing a

service to whom. Traditional activities of drainage can be regarded as a service by water managers to landowners. According to Van Bommel et al. (2003), in this perspective, the enlargement of water storage capacity looks more like stopping a current service than the provision of a new one. However, the authors argue, water storage in The Netherlands is more than just stopping discharge. Because of the scarcity of space and the high density of investments, water storage can only be achieved in a concentrated way in areas that have been specifically appointed for that purpose (perhaps in combination with other functions). Water storage is thus an 'active activity', rather than a passive one. Therefore, costs will have to be made by water managers. Besides, a change in land use functions occurs, which changes the property rights of the landowners and users. Therefore, retention or storage of water, for the benefit of preventing water excess or shortage elsewhere, can be typified as a water service that is being provided by owners and/or users of the designated lands. For this service, the benefit principle can be applied. Since it is not easy to demarcate who benefits from the measure, these measures are likely to be paid from the water managers general means.

Perspective of spatial planning on spatial water management approaches

The most recent policy resolution on spatial planning in rural areas at the moment of writing this thesis, the *SGR2 (Structuurschema Groene Ruimte 2)*, follows the spatial choices made in the *Vijfde Nota voor de Ruimtelijke Ordening (VijNo; Fifth National Policy paper on Spatial Planning)* (Ministerie van VROM, 2001). This paper states that a total of 490.000 hectares of land will have to be reserved for water retention and storage measures according to the new water quantity policy, as presented by the advice of the Commission on water management for the 21st century (Commissie Waterbeheer 21^{ste} Eeuw, 2000). Spatial consequences vary from the creation of open surface water for the storage of excess water in regional systems to adaptations of land use functions and spatial measures. The *SGR2* too has expressed the strategy of combining other land use functions, such as agriculture, nature and recreation, with water storage. Measures for water storage may reduce the possibilities for other functions in an area. The *SGR2* states that in those cases, additional spatial measures will have to be taken to mitigate the effect of the choice for water storage, and that the loss of production will have to be compensated for, for example via the mechanism of blue services. The recently published *Nota Ruimte (Policy paper on Space)* (Ministerie van VROM, 2004) is a combination of the policy resolutions of *VijNo* (Ministerie van VROM, 1998) and *SGR2* (Ministerie van LNV, 2002). This policy paper aims to leave the restrictive spatial planning policy and leave more room to the market and regional and local public authorities.

From the description above, it becomes clear that national spatial policy aims at combining land use functions and at more privatisation/liberalisation and deregulation. The combining of land use functions and deregulation (region-oriented approaches) may facilitate arrangements based on incomplete contracting. The consequences of a more liberal approach for these types of arrangements are not directly clear. According to Van Bommel et al. (2003), such an approach will reduce possibilities for PPPs, since the role of public parties will decrease. Private parties than no longer need public parties to realise their plans in rural areas and public parties can no longer represent general interests via high demands with regard to the public facilities of development sites. The consequence of this enlarged freedom is that it will be more difficult to link water storage measures to new projects in

rural areas, and thus opportunities for PPP in water management decrease (see Van Bommel et al., 2003).

Perspective of agriculture

In rural areas, farmers form the majority of landowners. Therefore, it is important to know what position farmers have towards spatial approaches to water quantity management in rural areas. In the position paper *Nieuwe waarde van water* (LTO-Nederland, 2001), LTO-Nederland¹⁴⁰ presents her vision on the changing position of water in Dutch society and the consequences of this change for agriculture and horticulture. LTO sees many opportunities to apply the new view on water (water as a planning principle, water in relation to the living environment, calamity polders, room for the river) in agriculture and horticulture. In this respect, LTO chooses a commercial approach. Agriculture and horticulture need to be given opportunities to approach the new value of water on a sound financial basis. An important aspect for LTO in this approach is that the existing distribution of property rights is taken as a starting point and that changes as a result of the new water management approach do not lead to a deteriorated position of agriculture and horticulture. Therefore, negative financial consequences for agriculture and horticulture would have to be compensated, damage of precipitation would need to be insurable, water would have to be made a source of income for the landowner/-user, and changes in water management would need to consider the present land-use and investments in agriculture and horticulture. LTO holds the position that water is a common good and that only concrete water management measures can be charged on polluters/users/benefiting actors. LTO is not in favor of a system of levies on water use that does not have a relationship with the cost cause. What LTO exactly means by these statements is not clear. From this description, it becomes clear that the LTO agrees with more liberalisation and privatisation of water systems management, but that arrangements to organise new approaches in water systems management have to be based on the existing distribution of property rights. This means that these arrangements will have to meet the concordance criterion. The financing of water management measures is judged on the basis of the weak sustainability paradigm, and thus on the standard polluter pays principle and the competitive position of Dutch agriculture and horticulture is a strong criterion for judging the feasibility of arrangements.

Normative discourses

According to Van Bommel et al. (2003), in recent years, policy coalitions have formed and policy initiatives have been taken related to three discourses in water management (Van Bommel et al., 2003: 32):

- Water as a (pre-) condition. This is the traditional perception of the function of water in rural areas, in which water quality management and water level management are tuned to (i.e. 'serve') the land use function (functional interest);
- Water as a service. Water contributes to the attractiveness of the living environment or water storage helps to prevent or mitigate water nuisance as a result of floods (societal interest);
- Water as a product. Water is a scarce product, for which other parties (economic actors) are willing to pay (private interest).

¹⁴⁰ The national branch organization for agriculture and horticulture.

A number of other discourses can be distinguished, but according to the authors, these can all be brought back to one of the three discourses mentioned above. Note that these discourses are general in nature (i.e. not specific for water quantity management). However, they were filled in from the perspective of water storage by Van Bommel et al. (2003), and therefore discussed in this subsection.

Water as a condition

According to Van Bommel et al. (2003), actors that use this discourse are agriculture, urban landscape architects, nature managers and water authorities. For these actors, water predominantly serves a functional interest. Water has to meet certain qualitative and quantitative standards in order to condition the land in such a way that the designated land use function can be applied in an optimal way. The problem definition in relation to the water management system according to this discourse is that water has been corseted too much in the past. Natural fluctuations in water level cannot be properly absorbed by the system. Solutions to this problem: conclude and accept that not all functions can be optimally served; the water management system needs to maintain some degree of resilience. Look for an optimal balance between function-demands, based on a reconsideration of the weights of the various functions and possibly a change in land use functions. The introduction of production functions that coincide well with a higher average water table, such as growing energy crops and fish farms fit well in this discourse.

The current rules of the game are that provinces lead the reconsideration of the weight of various land use (and water use) functions and it establishes the *Gewenste Grondwater- en Oppervlaktewater Regime (GGOR)*; desired ground and surface water regime). The water board provides input for this reconsideration in the form of technical data. Damage to existing functions resulting from a possible rebalancing of land use functions should be compensated financially.

Water as a service

Adopting this discourse means that especially the societal interest of water is stressed. The term 'water services' is used in two different circles, with each its own discourse:

- Opinion leaders of LTO, the Ministry of LNV and green investors;
- The European Union (WFD) and the Ministry of V&W.

The former coalition interprets a water service as landowners providing a contribution to the characteristics of the water system as desired by the (urban) society. The latter coalition interprets 'water service' as services provided by water to humans by human intervention (public or private), the costs of which need to be recovered or compensated. Although these interpretations seem to overlap substantially, there is a subtle difference, since the former coalition only seems to consider the services landowners provide to society as a whole, while the latter, besides that, also considers the services provided by water managers to landowners.

The problem definition and directions of solutions also differ between these coalitions. The former coalition states that there is a societal demand for new functions in rural areas. At the same time, the importance of agriculture in rural areas is diminishing. Therefore, agriculture needs new perspectives. These are sought in meeting the new demands of society. Besides, farmers are regarded as the cheapest managers of the rural area. According to the other

coalition, the problem is that environmental costs of present water system use are not visible (external costs) and are not sufficiently ascribed to the users/polluters. This reduces the ecological quality of river basins. The solution presented is that of mapping and highlighting the effects of water use, assessing the costs and claiming the costs on the user. This type of problem definition and solution, formulated in terms of externalities and internalising them in economic transactions, is typically that of a neo-classical economic approach.

The rules of the game advocated by the first coalition are that the service provided by the land user is compensated by an amount derived from the importance (relevance) of or interest served by this service. The position of the second coalition with regard to rules of the game is represented by the Commission for Integrated Water management (a permanent water advisory commission for the national government), which states that water level management is a water service to soil users. Environmental costs caused by water level management therefore need to be paid by these soil users (polluter pays principle)¹⁴¹. The interpretations of both coalitions do not necessarily need to conflict. However, debate is likely to emerge between these coalitions about the question who is offering a service and who is benefitting from that service. This debate is actually about the distribution of property rights.

Water as a product

Interpretation of water service

In this discourse, water is mainly regarded from the point of view of private interests. Traditionally this is the interpretation of drinking water companies and industry. More recently also agriculture, nature management organisations, project developers, recreational undertakers and green investors have started to look at water from this perspective. The argumentation for this view is that water is becoming a scarcer good (demand is growing, while supply fluctuates) that can (best) be allocated via the market-mechanism. There is an increasing willingness to pay for fresh water of a natural quality, for living at the waterfront and recreation on and around water bodies.

Problem definition and directions of solutions

According to this discourse, the problems are that water is discharged too fast, it has been expelled from the living environment, and society has turned its back to water. As a consequence, there is too limited awareness in society of the great importance of water for the quality of life and as a resource. Directions for solutions are:

- Retention of rainwater and supply of rainwater to other land-users, other private parties, drinking water companies and nature managers;
- Creation of room for water as a recreational product or product for living.

¹⁴¹ It can be stated that for a full internalisation of externalities, not just environmental costs should be paid (according to the polluter pays principle), but also the management costs made for maintaining a specific level, according to the user pays principle. To some extent these management costs are already paid for via the inhabitant fee (*ingezetenenomslag*). But a stricter implementation of the 'full cost recovery principle' of the WFD and the benefit principle would raise the costs for specific groups of benefitting actors, while reducing the costs for actors paying a 'general fee' to water managers, such as the inhabitant fee.

Rules of the game that have so far been introduced are that:

- water is a collective (common) good, but exploitation costs can be charged;
- residential areas (houses) can be built in exchange for the construction of (wet) nature or storage capacity ('red for green', 'red for blue').

According to Van Bommel et al. (2003), ideas for new rules of the game that would fit PPS approaches are that:

- land users settle contracts for water supply with customers, and are responsible for water management. They make their own judgement whether they use the water they own for their own purposes or supply it to others;
- the introduction of new functions in an area that can convert water in a profit is facilitated. This means, amongst others, the amendment of a zoning plan or subsidising pilots.

As shows from the discussion of these discourses, 'water as a service' and 'water as a product' aim to introduce more 'economic sense' in water management as compared to the discourse 'water as a condition'. The way this 'economic sense' is made operational differs in emphasis. In the discourse 'water as a service', the emphasis is largely on recovery of costs of water management, while in the discourse 'water as a product', the emphasis is more on the (economic) value of water for society.

5.4.5 BLUE SERVICES

INTRODUCTION

The policy approach of giving room to water has, in terms of water management, multiple objectives. It aims at reducing flood risks in periods of excess of water, at reducing drought in periods of shortage of precipitation/inflow of water, at recharging ground water tables and at shaping conditions for healthier and more resilient aquatic ecosystems. With regard to non-water related policy issues, the approach may have some additional benefits as well. In agriculture, a lot of attention is paid to making the sector more sustainable. Therefore, high intensity, industrial agriculture as has been promoted till recently, is (slowly) being turned into more sustainable forms of agricultural production. The claim of stakeholders depending on traditional agricultural production systems, however, is that these more sustainable forms of agriculture are not competitive, and that farmer income will reduce when switching to such a system of production. Farmers offering services with regard to water quantity management may receive structural income from other than core activities. Such water related services offered by farmers are referred to as 'blue services' (*blauwe diensten*). This concept is relatively new in water management, but has been applied in other policy domains.

Blue services are water related equivalent of green services, a policy concept that has been used in nature management for a number of years. The definition of blue services as used in the report 'Blauwe diensten' by Van Bommel et al. (2002) has been adopted from the definition of green services as presented in the '*Tweede Structuurschema Groene Ruimte*'

(SGR2) (Ministerie van Landbouw, Natuurbeheer en Visserij, 2002)¹⁴². The definition used in the SGR2 for 'green services' is: 'activities or management measures aimed at meeting societal demands that exceed standard practice and for which the entrepreneur should be rewarded'¹⁴³. According to the authors, analogous to this definition, blue services are therefore 'water management related, market based activities performed for others'. As with green services, water management activities offered by private actors only qualify as blue services in case these activities go beyond standard activities that can be expected from these actors, based on legal requirements. This also implies that all activities performed by water boards that enable the standard activities of landowners can be regarded as services supplied by water boards, that should be compensated for this. As such, the qualification of 'standard activities' demarcates property rights with regard to water use, products and services. Blue services are usually provided by landowners, which are often, but not necessarily farmers. In the report by Van Bommel et al. (2002), opportunities for blue services are described from the perspective of farmers. The authors interpret the range of services as relating to water, either or not combined with nature, landscape and public accessibility.

As was described in the introduction to 'room for water in rural areas', a combination of societal developments has led to a discussion about transforming agriculture into a more 'sustainable' kind. Several options exist for this switch towards (more) sustainable agriculture, varying in the degree to which this switch takes place. Some farmers may radically switch to a type of agriculture that is completely based on ecological principles, such as bio-organic farming. Most traditional (i.e. modernist) farmers, however, are likely to switch to a less radical form of sustainable agriculture. In this new type of agriculture, development of (traditional) agriculture (the key activity) is combined with other products and services provided by the farmer. Farmers may act as managers of rural areas where a combination of agriculture and (wet) nature development is desired. In this situation, they may opt for a regulation including compensation for making their land available for controlled flooding for storing excess water or for offering recreational services. This shift is in line with the trend of ecological modernisation.

According to Van Bommel et al. (2002), blue services can relate to both private and public (societal) demand. The private demand can relate to a need for water when it's scarce. This demand can come from farmers, industrial companies and drinking water companies. A *blauwe dienst* can also be a derived demand, for example conserving a *veenweidelandschap* (a characteristic landscape of meadows on peat) or realising a nature area by raising the water level. The demanding parties in the latter case are managers of nature areas and governments. A societal demand can, for example, relate to safety. To guarantee safety, water boards may need extra storage capacity, which can be offered as a *blauwe dienst* by landowners. Although blue services can in principle contribute to both water quality management and water quantity management, the emphasis in water systems management

¹⁴² The SGR2 is a *Planologische Kernbeslissing* (PKB, spatial planning key decision) for spatial planning in rural areas. A PKB is a policy instrument that gives the central government the opportunity to bypass the common procedure for policy plans for spatial planning in special situations. Instead, a PKB is subject to a shorter, more hierarchical procedure.

¹⁴³ Free translation from Dutch by the author.

at present is on spatial measures for water quantity management. This is also the case in the study by Van Bommel et al. (2002).

KEY CHARACTERISTICS OF BLUE SERVICE-ARRANGEMENTS

From a theoretical perspective (based on a.o. new institutional economic theory about incomplete contracts), a number of key characteristics can be identified for the concept of 'blue services'. These are described in this paragraph.

Voluntariness

Precondition for blue services as described in the study by Van Bommel et al. (2002) was the voluntary base of the arrangement. This is in line with the arrangements for nature conservation as discussed in chapter 3. However, the authors recognise that blue services can best be offered collectively. This is likely to enhance the effectiveness in reaching policy goals, especially in water quantity management, since water does not stop at the border of the land of an owner not taking part in the arrangement. These conditions to some extent contradict each other. A collective approach has a number of advantages. It offers opportunities for intermediary parties, because they can play a role in the co-ordination and collective offering of services and optimisation of demand and supply and in financing initiatives and making deals. As such, offering blue services collectively can reduce transaction costs. Besides, from the perspective of public water managers, collective agreements are likely to be the most effective arrangement for attaining water management goals. However, collective agreements may undermine the pre-condition of voluntariness. Landowners that would prefer to stay out of the arrangement may either veto the arrangement, or may feel to be put under pressures by other landowners to join the arrangement. Since landowners cannot be forced to co-operate to a blue service arrangement, collective agreements face a high risk of failure.

Purposes and policy goals

The main purpose of blue services is cost-effective water management through combining land use functions. The central idea is that using land for multiple goals, among which water management, leads to efficient land use and to lower water management costs, since paying for a blue service will in many circumstances be cheaper for the water manager than buying the land. The price of the blue service will be established somewhere between the compensation of damage for the supplier and the benefits for the demanding party. Another (theoretical) advantage of blue services over purchase of land is that the management arrangements can be achieved faster than the purchase of land by water managers for the purpose of water management. Procedures for expropriation of land are often lengthy, because of juridical procedures of landowners that do not want to sell their land. In blue service arrangements, such procedures can be circumvented.

According to LEI¹⁴⁴, the demand for blue services comes forth from several water related goals in *NW4*. These goals vary per blue service: water retention (for supply in dry periods), storage (prevent damage elsewhere), purification, fighting desiccation, salinisation or

¹⁴⁴ *Landbouw Economisch Instituut* (the national institute for agro-economics).

subsidence. Besides internal integration of policy goals (combining policy goals and policy approaches in water management), external integration (combining policy goals and approaches between policy domains) is an important legitimisation of blue services. External integration of policy goals involving blue services relate to nature (EHS), healthy (aquatic) ecosystems, landscape enhancement, preserving cultural history, recreation, housing, new business activities for farmers (revitalising bio-industry areas), revitalising rural areas in a general sense, etcetera.

Contracts

Landowners will only offer blue services if they see good perspectives for this new approach. Since private landowners are often (economic) entrepreneurs, good perspectives will often be expressed in terms of business opportunities. Often substantial investments will have to be made by the landowner to adapt to the new approach. Therefore, in order for landowners to judge positively about the business opportunities, two main conditions will need to be met: a proper price for the blue service (which can (also) cover the costs of the investments and compensates foregone income from former practices), and guarantees for the entrepreneur that the new arrangement will provide business opportunities over a substantial length of time ('continuity'). Therefore, binding agreements will have to be made between demanding and supplying parties, based on new institutional theory.

Co-ordination mechanisms

It is important for all parties that a clear understanding exists about the question which actor takes the decision for demanding a blue service and about the exact nature of this service. Part of this aspect is the division of responsibilities and the co-ordination of tasks. Besides, it is important to know the type of service demanded/offered (for example an option for use or actual use; in other words: the property rights of the demanding party) and the level at which the service is provided (a single patch of land, a single farmer or a collective of farmers). A second aspect is the decision who can best judge the action to be taken. Related to this is the third aspect, the information needed to take these decisions. By co-ordination between parties, risks and uncertainties can be limited. This can in turn lead to lower (transaction) costs. In fact, reducing risks and uncertainties is a central theoretical characteristic of contracts (see also North, 1990).

Motivation mechanisms

Motivation mechanisms should ensure that both the demanding and the supplying party/-ies of blue services do not abuse the agreement (a situation referred to as 'moral hazard'). For example, for storage of peak flows, it is important that the water board is given an incentive to choose the measure leading to the least (societal) costs. Ideally, in this case, the contract also stimulates the demanding party to take preventative flood protection measures. On the other hand, the supplying party should receive an incentive to switch to land use systems that result in less damage in case of inundation. Contracts often lead to relation-specific investments. Since these investments are usually made specifically for the situation related to the contract, they are often of little value for other purposes. Such investments entail a 'hold-up' problem. As soon as such investments are made, the opposite party has an incentive to renegotiate the contract. This problem can be circumvented by agreeing upon long-term contracts.

Transaction costs

According to Van Bommel et al. (2002), it is important to minimise the direct costs of a contract. Direct costs are, among others, costs for collection of information, negotiation, monitoring and conflict resolution. Contracts for blue services will often be very specific, which leads to high transaction costs. By using experience with blue services elsewhere, these contracts can probably be standardised to some extent, thus lowering transaction costs. The same counts for settling contracts with cooperatives of landowners, which reduces the number of negotiations. Besides, these co-operatives can capitalise local knowledge and trust ('social capital'). Standardisation was indicated before as an important aspect of institutionalisation of certain management arrangements. Agreements will be followed up more easily and more properly if they are clear and if parties know what to expect from other parties. Transparency also reduces transaction costs.

As shows from the discussion of the characteristics of contracts for blue services, a central (and crucial) aspects of establishing such arrangements is taking away uncertainty. This can be done in various ways: by making clear agreements about the nature of the service provided in the specific situation, about the division of power and resources and by institutionalisation of the type of arrangement through standardisation.

BLUE SERVICE-ARRANGEMENTS

As was mentioned before, possibilities for farmers to offer '*blauwe diensten*' (blue services) were studied in the report '*Blauwe diensten*' by the LEI institute (Van Bommel et al., 2002). Goal of this study was to gain insight in the purposes the concept can serve, the conditions needed to achieve these goals, the applicability of the concept and the instruments that can be used to make demand and supply of these services meet. As with most other spatial measures related to water, the need for these services is justified by advocates on the basis of climatologic and societal developments already discussed before. Since the principals of the study by LEI were the *Unie van Waterschappen* (Union of Water boards), *LTO-Nederland* (the branch organisation for agriculture) and the *Ministerie van LNV* (Ministry of Agriculture, Nature management and Food quality), the focus in the report is on blue services offered by farmers. The authors distinguish five 'potentially most successful' categories of blue services:

- water conservation (storage of excess water for dryer periods);
- water storage (storage of peaks in precipitation to prevent damage locally or in other areas);
- water supply (supplying a certain quantity and quality of 'basic water' for drinking water preparation, for processing or cooling water for industries or for flushing and irrigation of intensive crop cultures);
- enhancing the beauty of the landscape (specific recreational value and value for the general well being of society);
- wastewater treatment (collection and purification of wastewater, for example process water, effluents from purification plants, overflows of sewers, etc.).

Policy arrangements for these various categories will be analysed and compared in the remainder of the subsection.

Blue service arrangements compared

Van Bommel et al. (2002) studied three types of blue services, namely an increase in the water table in peat areas with cattle farms, a buffer zone around nature areas being part of the main ecological structure (*EHS, ecologische hoofdstructuur*) and storage of peak flows. The first type of service relates primarily to the categories of 'water conservation' and 'water supply' (for nature) as mentioned above. The second type relates mostly to 'water supply' and 'enhancing the beauty of the landscape'. The third type of service relates to the category of 'water storage' as mentioned above. This shows that the purposes for which blues service-arrangements are constructed may be very diverging.

Physical and societal trends and developments

A number of trends and developments relating to blue services were already addressed when discussing the 'room for water'-policy for the rural area. These were, for example, the trends in governance towards privatisation/liberalisation, deregulation and 'area-specific policy'. From the perspective of water management, one development related to governance may be added. Water authorities are reconsidering the safety approach towards flood risks, which at present is based on expected maximum discharges. The strength of the flood defence systems is based on this expected maximum discharge, and its strength is therefore expressed in terms of the chance of a specific discharge flow occurring and the chance of failure of the flood defence structure in that situation. The reason for the reconsideration of the flood defence approach is that water authorities do no longer wish to be solely responsible and liable for flood protection. The existing flood protection system has led to the situation that inhabitants expect that their safety with regard to flooding will be guaranteed by public water authorities. Consequently, in case this flood protection fails, inhabitants will hold these public water authorities responsible for damage and casualties. At the same time, however, because of the perceived safety guarantees provided by public water managers, flood risks¹⁴⁵ are increasing because of continued investments in man-made capital in flood prone areas. As a consequence, public authorities run an increasing risk of substantial financial losses for the compensation of damage due to flooding. As long as public authorities are solely responsible and liable for protection against flooding, these investments will continue, and public authorities will have to continue investing in flood defence structures to protect these investments. Whereas private actors usually stress the importance of deregulation and privatisation/liberalisation from the perspective of better business opportunities and reduced public expenses, public authorities aim to use the 'opportunity' of these trends to share risks, responsibilities and liabilities with private actors.

In their new approach to flood protection, public water authorities want to raise the awareness in society of the presence of water and the risk of water nuisance and floods. The ultimate goal of this strategy is to make society better adapt and anticipate to the presence of water and flood risks, in order to reduce overall societal costs of water management and (protection against) flooding. The presence and influence of water on decision-making can be enhanced by the policy principle 'water as a guiding principle in spatial planning'. This

¹⁴⁵ Flood risks are usually defined as the chance of a flood occurring times the damage that flood will do. In case of a high density of investments in a flood prone area, the flood risk will be higher than in case of a low density of investments with an equal flood chance (i.e. equal strength of the dyke), because of a higher damage in the former in case a flood does occur.

principle is meant to lead to a better location policy from a hydrological point of view. Combined with spatial water quantity measures, this may lead to spatial planning in which water is given a more prominent and 'natural' (logical) place. However, these principles and measures are not likely to sort the desired effect as long as the responsibility for protection against water nuisance and floods lies completely with public authorities. Therefore, making private actors and other public actors responsible for water nuisance and flood damage in situations in which these actors have not based their activities and decisions on the principles mentioned above can be considered a crucial step in effectuating these principles. Measures such as water storage as a blue service may contribute to the awareness in society about the presence (and unpredictability) of water by making the effects of high precipitation and discharge more visible. Besides the argument of efficient solutions in water management, this awareness raising may be an important reason for public water managers to stimulate the application of blue services. However, whether or not these arrangements will also lead to the desired redistribution of responsibilities and liability is in no case certain yet. This matter will be discussed later in this section.

Policy arrangements: elements and relationships

In this part, I will analyse and compare the elements of the policy arrangements for the three blue service arrangements as discussed by Van Bommel et al. (2002). This analysis starts with the description of the institutional framework, followed by the discourse about blue service-arrangements and related issues (such as room for water policy), actors involved and the resources used by these actors to influence the outcome of the policymaking process.

Formal institutions

Legal framework

Every type of blue service and every geographical area has its specific elements in the institutional framework and related consequences. In some respects, the institutional frameworks of blue service arrangements will overlap. A major common point of attention is concordance with EU-framework regulations for government support to agriculture. While long-term arrangements may be desirable from the point of view of (cost-) effective water management measures and reducing uncertainties for actors involved, these arrangements are likely to conflict with EU-regulations, since state subsidies to domestic economic sectors are subject to time restrictions. Besides, an arrangement with a cooperative of landowners may also be desirable from the point of view of (cost-) effective water management, but will be more readily regarded as state support than an agreement with a single landowner. The question whether or not 'government support' via blue services is allowed by the EU also depends on whether or not the blue service falls within or outside the range of 'good agricultural practice', which has been standardised at EU-level (see 'guidelines and standardisation' below). Government support for additional measures outside 'good agricultural practice' are more easily allowed than activities that fall within this range.

In some situations, the applicable legal framework may even change due to the introduction of a blue service. For example, raising the water level in an area to conserve water or reduce desiccation, salinisation or subsidence, may result in dry ditches becoming permanently filled. This change makes the rule *Lozingenbesluit Open Teelten en Veehouderij* (Decision about discharges from open cultures and cattle breeding) operational. This means that

measures have to be taken to prevent manure, fertilisers and pesticides from ending up in the ditch. This rule only applies to ditches containing water, hence the change in scope of the rule. Adaptations to agricultural practices according to the *Lozingenbesluit Open Teelten en Veehouderij* may result in decreased agricultural output, leading to higher claims for compensation by farmers. With regard to flood damage, the frequency and consequences of inundation are decisive for the type of damage compensation. In case of calamity storage, because of the low frequency and large consequences, a conventional compensation scheme for damage according to the *Wet Toekenning Schadevergoeding* (Act on compensation for damage in case of disasters) applies. In cases of more frequent use of land for water management purposes, the compensation needs to be agreed upon in the blue service-contract. Another required change in the legal framework resulting from the initiative to introduce blue services is that spatial water management measures may require a land use change in municipal zoning plan(s). Finally, programmes relating to regional development may bring along specific regulations. This is the case for the blue services that are envisioned in areas subject to the *Reconstructiewet* (Act on the restructuring of former bio-industrial areas). This act allows for a special, shortened procedure for these areas, that in some respects is comparable to *PKB*-planning procedures. Therefore, this act is likely to lead to the assignment of authorities, responsibilities and liability and decision-making procedures that differ from regular spatial planning procedures. All the specific laws and regulations applying to specific situations increase uncertainties for the parties involved in the arrangement. In order to reduce these uncertainties, the contracts regulating the agreements in the arrangements will become more elaborate, leading to higher transaction costs.

Guidelines and standardisation

Since blue services are a rather new concept in water management, the various arrangements have not been standardised yet. According to theory, standardisation will reduce transaction costs and will 'institutionalise' (stabilise) this policy arrangement. In its report, LEI therefore recommended making 'ideal-type contracts' for various types of blue services. In other words, the authors recommend standardisation of the types of blue service arrangements in order to reduce transaction costs. According to the authors, these ideal-type contracts should be based on knowledge about contracting theory, combined with the relevant legal framework. In these ideal-type contracts, the compensation and payment structure plays an important role. The ideal compensation and payment structure amongst others depends upon the instruments chosen (see further below) and the type of blue service offered. Another important factor is whether the service is temporary or permanent in character. Finally, the type of (ideal) contract also depends on the question whether or not structural investments have to be made to adapt the land use to the blue service (see the discussion of 'moral hazard' as described before regarding the 'key characteristics of blue services'). Ideal contracts may help actors involved in choosing the arrangement that best suits the situation. At the same time, however, 'ideal contracts' only apply to 'ideal situations', and therefore, in most cases, they will have to be adapted to the local situation, requiring co-ordination efforts and involving transaction costs.

Economic rules

Market rules

Blue services can be regarded as some sort of market operation in water management. A situation exists of demand for and (possibly) supply of services, and the value of these services is reflected in a price, which is the result of this interaction between demand and

supply. Besides, actors in the market have the choice whether or not to make the transaction. However, the market will not be ideal, since it does not meet the requirements of a fully competitive market. Because of the complexity of the arrangements, contracts will always be incomplete. That is to say that actors will not be equally informed (a situation commonly referred to as 'information asymmetry') and substantial transaction costs will have to be made for the design of and agreement about the contract. Besides, locally, water boards have monopoly in demand. In case blue service-arrangements become widespread in the future, it may become possible to compare various blue service arrangements for benchmarking. This exercise is likely to reduce information asymmetry, which leads to a more level playing field in the market in that respect. It will then be harder for actors involved in (negotiations about) blue service arrangements to take (disproportionate) advantage of the arrangement. Two other aspects expected to lead to a better functioning market for blue services are freedom of choice and the presence of alternatives for both suppliers and buyers. These market characteristics contribute to real (i.e. reasonable) compensation and cost-effective ('competitive') contracts (see chapter 2 of this thesis about pre-conditions for and benefits of a competitive market). Notwithstanding options for improving the market, since the market for blue services is complex, incomplete contracts are likely to be the best, or even the only, way to realise transactions in these markets.

Critique on the market functioning of blue service arrangements is uttered by Bleumink (2004). According to the author, the market for blue services is far from a 'real' market. He states that room for water will be realised anyhow, no matter what the preferences of the landowner are. The locations for water storage have usually already been outlined by water managers before negotiations about blue services start. Bleumink goes on to say that the price of the blue service cannot be negotiated about either. Government authorities are the only demanding party (except for an occasional water company), which means that the compensation for a blue service is based on the damage done, and not on the benefits of the service.

Property rights and problem ownership

According to Van Bommel et al. (2002), with regard to most blue services, the distribution of ownership rights of land is clear. The allocation of disposition and use rights, however, is often less clear. Clarity about disposition and use rights is crucial for determining who is problem owner, and (thus) for establishing whether or not the demanding party should pay for the activity (the blue service) and what price should be paid. The discourse about property rights and problem ownership will be addressed further below.

Contracts

From the description of (hypothetical) cases regarding blue services by Van Bommel et al. (2002), it shows that in most situations, both parties (suppliers and customers) benefit from long-term contracts, since this offers security (reduces risks). However, the risk of hold up always remains. This situation may be solved by attaching conditions (costs) to renegotiations. Besides, building in incentives in the contracts for both parties can also reduce the risk of moral hazard (misuse of the agreement). Long-term contracts can also reduce transaction costs. According to Van Bommel et al. and contracting theory in general, contracts should be transparent and contain clear conditions with regard to responsibilities, liabilities, deliverables, etc. Because at the moment of study, very few blue service

agreements had been designed, let alone signed, no information is available about the exact content of blue service contracts.

Elements of policy

Policy goals

The general goals of blue service arrangements were already discussed earlier. Therefore, the discussion here is restricted to pointing to a specific aspect related to the goals served by blue service arrangements. With regard to water quantity measures, structural measures (increasing water level to increase water reserves or reduce subsidence and salinisation) may conflict with occasional water management measures (peak storage), since structurally raising water level reduces storage capacity. This should be kept in mind when considering blue services. These two types of measures also have different impacts on the possibilities for land use. A balanced decision on the location and type of water management measure would therefore require a long-term vision on land use. In such a long-term vision, aspects should be included such as the ecological main structure, the future of agriculture and the impact of the (specific) spatial water measure envisioned on various types of land use.

Policy instruments

According to Van Bommel et al. (2002), contracts and other instruments used in blue service-arrangements play an important role, because they determine whether or not demand and supply can be linked. In theory, a vast range of instruments is possible in blue service-arrangements, such as use rights, management agreements, compensation schemes for repeated compensation, one time compensation, water damage insurance schemes, either or not combined with compensation schemes, plot exchange (land-mobility) to increase effectiveness and efficiency and higher prices for agricultural products¹⁴⁶. According to contracting theory, the characteristics of the blue service are decisive for the applicability of the instruments. For example, if the service has an occasional character (such as peak-storage), 'use rights' are most likely to work, while 'management agreements' are probably most suitable if the service has a more continuous character. These characteristics will vary for each specific arrangement. Because of these varying factors, and because no standardisation and limited institutionalisation of the arrangements has taken place so far, the construction of contracts and the choice of suitable instruments require considerable efforts in this stage of the development of this water management arrangement. For a discussion of the criteria for the choice of instruments in the blue service arrangements discussed by Van Bommel et al. (2002), I refer to the paragraph about selection criteria (micro-level analysis) further below.

In a pilot project in the valley of the river Dommel, in the south of The Netherlands, the water board works on adapting an existing instrument to the new situation of water storage on farm land. The *keur*, which is traditionally an instrument that is used for regulating the water level to a level that serves specific land use functions, such as living or farming, is now being adapted to the option of water storage. This land use option will require flexibility in the water level, and thus in the instrument regulating this water level (the *keur*).

¹⁴⁶ For a more elaborate discussion of possible instruments for blue service arrangements, I refer to Van Bommel et al. (2002: 73 a.f.) and Hoekstra et al. (2002).

Discourse

Ontological and normative discourse

In general, there is little disagreement about the ontological discourse that the amount of precipitation will increase and that larger fluctuations in precipitation will take place. In the normative discourse, little or no disagreement seems to exist about the policy approach to the quantitative water challenges either. The idea that more space is needed for water quantity management, and that the policy 'room for water' is (thus) the right approach to quantitative challenges in water management, has become accepted as the main approach (and thus as the dominant normative discourse) in a very short period of time. The main debate therefore seems to be on the way to effectuate the policy of 'room for water', in other words, about the strategic discourse. The debate about blue service-arrangements and the instruments to be used in these arrangements is part of this strategic discourse.

Strategic discourse

According to the joint water managers in The Netherlands (central government, provinces, municipalities and water boards), blue services have been mentioned for some time as an attractive instrument for the realisation of 'water challenges' (*wateropgaven*) resulting from the advice of the Commission for Water management in de 21st century (see Commissie Waterbeheer 21ste eeuw, 2000). Among water managers, a need was expressed to realise these water challenges while maintaining the existing functions in rural areas. These existing functions are considered essential for the economic dynamics in the region and the quality of the living environment¹⁴⁷. A water board in the south of The Netherlands, that experiments with blue services, formulated the goal for which the instrument 'blue services' is applied as 'the achievement of a succesful combination of the realisation of water goals and conservation of vital rural areas, nature management and improving the quality of landscapes'. The large scale purchase of agricultural land and using this land for water management purposes is considered not only an expensive solution, but also an undesirable one from a social perspective. Agricultural enterprises are considered an essential part of the Dutch cultural-historic landscape. According to the water board, the fact that the water management challenges as formulated in policy require large amounts of space, emphasises the desire to combine land use functions on the available space (multiple land use planning). According to the water board, ZLTO¹⁴⁸ regards the blue services as a feasible option for a sustainable approach to and reinforcement of the rural area. From this discussion follows that the plea for blue services is the result of a combination two normative discourses expressed by water managers and supported by the agricultural sector: 'room for water' on the one hand and 'maintaining existing land use functions, with farmers as crucial managers of the rural landscape' on the other.

The attention for blue services in the political, administrative, scientific and societal arenas has so far resulted in only a few practical applications of the instrument. According to CLM, a foundation for research on sustainable agriculture, there are two causes for this¹⁴⁹. Firstly,

¹⁴⁷ Source: http://projecten.nederlandleefmetwater.nl/html/topic_10_152.htm

¹⁴⁸ Zuidelijke Land- en Tuinbouw Organisatie, the branch organisation for agricultural and horticultural business in the southern part of The Netherlands.

¹⁴⁹ Source: <http://www.clm.nl/actueel/060404.html>, or Hoekstra, 2004.

the theme (or concept) is only discussed in general terms. Only a few examples exist in which the water managers have managed to make the water related goals so concrete that they could be translated into services. Secondly, CLM identifies a lack in the availability of instruments for compensating the provision of blue services by landowners. According to CLM, several examples exist in which farmers were willing to co-operate in water management, but in which the lack of a proper framework for agreements obstructed cooperation. CLM draws a parallel between blue services and its 'inspirator' green services. According to CLM, green services (agricultural nature management) were only applied on a large scale as soon as a proper set of instruments was developed for the actual compensation of the services supplied by landowners. Therefore, CLM argues that blue services will also be applied on a larger scale as soon as a proper set of instruments is developed. This set of instruments should serve a business-like approach to the cooperation between water managers and landowners. The lack of a proper framework for compensation may plea for financial support from (central) public water authorities for pilot-projects in which such frameworks may be developed.

The chief of the department for public administrative and legal affairs of a water board called the debate about blue services as a snakepit (see Bleumink, 2004: 14). According to Bleumink, the major difference between green services and blue services is the fact that blue services to a large degree are restricted to specific locations. Even if only one farmer in the area envisioned for water measures would not want to co-operate, an area cannot be used for water storage, even though the other farmers in that area may want to cooperate. An option to solve this situation is to force the farmer that does not want to cooperate. However, based on the principle of equality before the law, the obligation to cooperate than also counts for the other farmers. The EU does not allow payments for activities that are obligatory. In other words, landowners have far less freedom of choice with blue services than with green services. Besides, for water boards, it is a thin line between obligatory water storage and voluntary services, which was identified as a precondition for blue service-agreements.

Discourse about property rights and problem ownership

According to some authors, the dominance of the discourse 'water as a condition' in rural areas, originating from sectoral water management, is slowly breaking down. Van Bommel et al. (2002) observe a shift in discourse about water quantity management from technical to spatial measures. LTO¹⁵⁰ has expressed that they are in favour of a business approach to spatial water quantity measures. The Ministry of LNV shares this position. The blue service approach is an example of such a business approach to spatial water quantity measures. The business approach, as interpreted by LTO, means that (extra) water related management activities undertaken by landowners should be regarded as services by these landowners, for which they should be paid. This indicates that the spatial approach to water quantity management is becoming accepted among stakeholders at the national policy level. Besides, according to these actors, these positions entail a shift from regarding 'water as a condition' to regarding 'water as a service'. The way the discourse 'water as a service' is interpreted however differs strongly among various actors. The dominant way this discourse is given meaning and shape by LTO is to have farmers get paid for water management services. Other actors, such as environmental and nature NGOs (see further below), may interpret the

¹⁵⁰ *Land- en Tuinbouw Organisatie*, the national branch organisation for agri- and horticultural business.

discourse 'water as a service' as the situation in which landowners pay for the full costs (including environmental and resource costs) of water management measures, such as strict water level management for agricultural purposes. As was discussed before, institutionalisation of 'good agricultural practice' plays an important role in this discourse.

Generally speaking, actors operating at the regional and local level are more reluctant to switch from 'water as a condition' to 'water as a service' than policymakers at the national level. This is also the case for most traditional farmers. Among farmers, the discourse 'water as a condition (for agricultural practices)' (i.e. optimal water level management for agricultural practices) is still dominant. From the farmers' perspective, this reluctance (change aversion) can be explained in a number of ways. One factor is the fact that a change in business always brings along risks and uncertainty. This risk and uncertainty predominantly relates to their economic position, but may also relate to the way they perform their agricultural practices. The way farmers (are allowed to) perform their agricultural practices may be an important factor in the decision regarding continuing or stopping their business. Another factor is the fact that the implementation of policy instruments always leads to the discovery of more practical obstacles than anticipated on the basis of theory. A third factor, related to the first, is the unfamiliarity with the new type of arrangement. On the other hand, however, these new arrangements may also provide new business opportunities for landowners that may ensure the continuity of their business. Convincing the landowners of these opportunities would require good communication by various parties. As a representative organisation, branch organisation LTO may play an important role in this process, since in general they have the position to influence the opinion building of farmers/landowners. Holding on to the old discourse may prevent innovative, flexible approaches to water management. As a consequence, and since environmental standards and water management related goals will put ever stronger constraints on agricultural practices and land use, more drastic reorganisations in agriculture may not be prevented in the future. Besides, holding on to traditional agricultural practices and paradigms is likely to lead to a deteriorated competitive position of Dutch agriculture in the EU and global market, because farmers can no longer comply to changing customer demands.

From the discussion of blue services so far, it can be concluded that the discourse 'water as a condition' (see Wiering and Immink, 2003) is still dominant in rural areas, although the term 'blue service' may suggest otherwise. The main argument for this statement is that, despite the introduction of arrangements that operate according to the discourse 'water as a service', such as blue services, property rights do not change. This fundamental question, however seems to be raised only at the national policy level and in the scientific arena, and does not seem to play a major role in the practical debate about blue services at the regional level. Whether this issue is neglected on purpose or as a consequence of unawareness is unclear. One explanation could be that the current disposition and use rights of natural resources are derived from widely accepted and (thus) institutionalised institutions (laws, regulations, instruments). In other words, the existing 'freedom of manoeuvre' for private actors is based on the boundaries drawn by public authorities in the past. In history, limited regulation existed regarding natural resource use. Over time, this use has been narrowed continuously by the construction of a (-n ever tighter) framework of rules and regulations. Private actors regard the room for manoeuvre that is left within this framework as their disposition and use

rights regarding the use of natural resources. Any activity undertaken by suppliers of blue services that limits their freedom of manoeuvre more than would be the case on the basis of the current boundaries (institutions), is regarded as an extra effort, which should be rewarded, for example in the form of payments or compensations for blue services. In other words, actors that have a central position in sectoral water management arrangements, such as farmers, are trying to adapt new approaches and instruments to the institutions that existed in that previous situation. Another explanation for the difference in discourse between the national and the regional/local level could be more simple, namely that at the local and regional level, more consensus exists about which activities are 'normal' and which are 'special' and that existing property rights are not questioned.

Environmental NGOs *Stichting Reinwater* (Foundation for clean water) and the *Waddenvereniging* (foundation for protection of the Wadden sea) focus their story line in this respect on the distinction between blue services and 'blue duties'. They define blue duties as laws and regulations related to water. According to the NGOs, compensations or payments for blue services should not be addressed before 'blue duties' have been fulfilled. This position is equal to that of the Ministry of LNV, who also states that only measures that go beyond the legal minimum, are eligible for compensation. Despite this position of the Ministry, the NGOs are afraid that payments for blue services will be too readily made, thus reconfirming existing property rights with regard to the use of environmental resources and absorption capacity. Especially with regard to water quality, existing laws and regulations are considered insufficient by these NGOs to achieve the standards set by the national government and the EU. According to the NGOs, the situation should be prevented in which farmers receive structural payment for bridging that gap. In those situations, laws and regulations should be tightened instead. This position is shared by most of the water companies. These organisations stick to the polluter pays principle for determining their position. Besides, both NGOs think that not all activities that go beyond the legal minimum should be paid. They identify a 'grey area' between blue duties and blue services, in which the decision whether or not activities taken by farmers to improve environmental quality is taken based on the notion of *zorgplicht* ('duty to care'). According to the NGOs, some activities in the grey area are part of this *zorgplicht* of agriculture, which is part of the Good Agricultural Practice formulated at both the national and EU-level. The NGOs state that only those measures should be compensated or paid that go beyond this *zorgplicht*. The description of the discourse about property rights and compensation shows that with regard to the new arrangement of blue services, no agreement exists yet about the boundaries between activities that are eligible for blue services and activities that can be indicated as blue duties. As a consequence of this lack of consensus, a 'grey area' exists that provides for room for debate and in which actors with different interests struggle for (discursive) hegemony. The analysis of the discourse about blue services related to water quality management will be addressed in more detail in the next chapter.

Actors and motives

In chapter 3, two categories of actors were distinguished: primary and secondary actors. The primary actors of blue service arrangements may vary somewhat according to the organisation of each specific arrangement. In general, however, the primary actors of blue service arrangements are landowners, water boards, municipalities and provinces. Since blue service arrangements were judged to be most effective when collective contracts with groups of farmers are set up, intermediary parties (mediators) may play an important role as well

and may thus be indicated as primary actors. These mediators can consist of agricultural representative organisations (like LTO, or agricultural nature organisations), specially erected committees (including representatives of landowners), or independent third parties, such as insurance companies, banks and consultancies.

With regard to customers of blue services (the demanding parties), two types of distinctions can be made. The first is that between public actors (water managers, province) and private actors. The second is that between direct and indirect demand. Direct demand is demand for water itself, for example by producers (farmers, industry, water companies). Derived demand is demand for services provide by water and (healthy) aquatic ecosystems, such as conserving nature and landscapes (public and private terrain managers). For society as a whole, water related services may for example relate to safety. In that case, blue services may offer opportunities for quick and cost-effective realisation of policy goals. In the present stage of development of the instrument, blue service arrangements are almost always initiated by water boards. In the future, maybe other public parties (f.e. provinces in relation to nature) and private parties (demand for water of specific quality and quantity) may become initiating demanding parties. Besides, supplying parties may themselves take the initiative to offer blue services. Probably, the arrangement of blue services will have to institutionalise considerably before private parties start demanding blue services or supplying parties take the initiative to offer blue services. Firstly, the normative discourse will have to switch to a situation in which 'water as a service' or even 'water as a product' becomes the dominant discourse in spatial, rural water systems quantity management. Secondly, institutions will need to be developed that guarantee the interests and positions of parties taking the initiative to engage in blue services.

Besides the fact that different spatial water measures may conflict (see the discussion of policy goals in the paragraph about institutions), the type of spatial water measure envisioned is also likely to influence the involvement and position of various actors. This will be illustrated here by taking environmental and nature organisations as an example. The position of nature managers and environmental and nature organisations (NGOs) towards blue services can be both positive and negative. The position is usually positive in case areas get a new land use function, with the combination of nature and water storage. In case existing nature areas are considered for blue services, the position can be either positive or negative. Nature managers are usually positive towards blue services if they include structural increase in water level or other structural measures to increase water retention, supply and/or quality. In case of temporary water storage measures, the position of nature managers and organisations is likely to be more negative, since the water that floods the area is usually of a different (inferior) quality compared to the water that precipitates in the area itself and may therefore result in damage to the ecosystem. A natural water level regime (thus a regime with fluctuation) is in general regarded as a positive development, since this provides opportunities for flora and fauna in and along water bodies. Such a regime might in some situations be offered as a blue service.

It follows from the discussion above that three main policy coalitions can be distinguished: firstly, the 'agricultural coalition', involving farmers, farmer representative organisations and to some extent the government agencies directly involved with agriculture, such as the Ministry of LNV. The Ministry of LNV (and other government agencies involved with

agriculture) have a somewhat digotomous position. On the one hand, they may try to formulate policy to support the agricultural economic sector in The Netherlands, while on the other hand, they impose restrictions on agricultural practices, amongst others from an environmental point of view, often driven by EU regulations imposed on its Member States. Secondly, the 'nature coalition', involving nature managers, environmental NGOs, government agencies involved in environmental policy and drinking water companies, which operates mainly from the perspective of ecological and environmental quality. Thirdly, the 'water management coalition', involving water boards and possibly other water managers, that operates from the perspective of achieving water management goals. However, these coalitions may differ depending on the type of blue service involved and the question whether or not this blue service serves specific interests. The same counts for 'coalitions of coalitions'. Two of the three coalitions identified may form a bigger coalition if interests coincide, or various stakeholders of different coalitions may form a new coalition. For example, environmental NGOs or nature managers may form a coalition with farmers in case they both regard a water management measure as having a negative influence on their land use practices. From this discussion follows that positions of actors and the formation of actor coalitions is highly specific for each issue and arrangement at stake. Important factors determining the position of actors in the arrangement are the policy goal(s) served by the arrangement, the impact of the arrangement on present land use and a possible change in land use function.

Power and resources

As was mentioned before, blue services are, by definition, based on voluntary agreements. This relationship with stakeholders (especially landowners) based on voluntary agreements is partly the result of the fact that water boards have limited possibilities of realising the new, spatial approach to water quantity management by means of other instruments. They do not have instruments at their disposal that allow them to enforce 'cooperation' of landowners and users. A change in land use towards 'water' in The Netherlands requires a change in the land use designation (*bestemming*) via the municipal zoning plan. This procedure in general is lengthy, just as buying land for water quantity management measures. Besides, with regard to the option of buying land, the designation of the land will still have to be changed via the zoning plan. Moreover, a loss of land value as a consequence of this change in designation will have to be compensated for. Co-operation with other (private) stakeholders is thus an approach that resulted out of necessity for water boards.

Landownership is a strong resource for farmers and other landowners in their negotiations with customers. And as was mentioned before, farmers can also fall back on the existing institutional framework or the appropriated right regarding pollution. This is relevant for both quantity and quality related blue services. With regard to quality related blue services, the appointed or appropriated right to pollute determines what activities by farmers are considered as 'good agricultural practice' and what activities go beyond that and therefore should be awarded (according to this right) (see also the paragraph about blue services in the next chapter). With regard to water quantity related blue services, higher water levels may have consequences for the way to deal with pesticides and fertilisers, for the type of crops to be grown and the possibilities of cultivation by means of heavy machinery (supporting capacity of the soil). The presence of surface water leads to stricter rules regarding this use. Therefore, farmers will want to be compensated for the reduced yield that may result from this.

As was discussed before, with regard to blue services offered by farmers, the 'environmental coalition' has strong reservations about the use of blue service-arrangements to achieve water management goals. As long as the blue service arrangements (including the related compensations and payments) are based on existing property rights, no fundamental change will occur in the positions of the actors involved. The same counts for the normative discourse about water management. This discourse may seem to be shifting from 'water as a condition' to 'water as a service', but the perspective from which this new discourse is given shape does not change. So a change of dominant discourse only takes place on paper. Therefore, the 'environmental coalition' focuses its resources on the lobby to make water quality related laws and regulations stricter. This would change the property rights of actors with regard to the use of environmental resources and environmental buffer capacity. For water quantity related measures (for example with regard to water level fluctuation), such attempts by the 'environmental coalition' to change the property rights do not seem to exist. The focus of this coalition seems to be on (direct) water quality related goals. One reason for this may be that it is more difficult to regulate water quantity management via specific laws at the central level. Whereas water quality standards may be relatively easily set at the general level, water quantity regimes are quite location specific and can therefore (generally speaking) better be set at a regional or local level. As a consequence, with regard to water quantity management, it will be more useful for stakeholders to focus their resources on governance at this level.

Micro-level: selection criteria

In chapter 2, I discussed a range of criteria for the selection and design of policy instruments. These criteria were divided into technical and political criteria. Below, I will be discuss selection criteria for blue service-arrangements. Besides generally applicable criteria for the selection of policy instruments, Van Bommel et al. identified three specific technical criteria derived from contracting theory. These criteria for (proper) contracts were coordination mechanisms, motivation mechanisms and transaction costs. For each of the cases studied by Van Bommel et al. (2003), three possible instruments were analysed on their 'scores' with regard to these three criteria. As a result of their score on these criteria, for the types of arrangements studied, the authors identify as the most probable instruments in blue service arrangements: use rights, management agreements, onetime compensations and possibly insurance schemes.

Technical criteria

Proper price or compensation

One of the preconditions for a blue service arrangement as identified by Van Bommel et al. (2002) is that the price paid for a blue service lies between the damage for the landowner(s) and the benefit for the customer. The price for the blue service will have to be competitive with regard to alternative products or services, such as alternative water storage measures, or other suppliers of water (cost-effectiveness).

Cost-effectiveness

According to Van Bommel et al. (2002), combinations of land-use functions at the level of an area or collective of land-owners, can lead to a cost reduction. From the (hypothetical) cases studied, it shows that farmers can in theory take measures that contribute to cost-effective water management. Cost-effectiveness is an important criterion for water managers. If cost-effectiveness would not be an issue, water managers might be more inclined to buy the land needed for spatial water management measures. As soon as land needed were acquired, no more efforts would have to be made for the construction of complex incomplete contracts. Purchasing land is thus an easier, but more expensive strategy.

Full cost recovery

According to SGR2, cost-benefit analyses of water management measures need to include the costs and benefits of *imponderabilia*, such as effects on nature and spatial quality. This approach is in line with the WFD principle of 'full cost recovery, including environmental costs'. Since the SGR2 was the white paper in which 'green services', the 'green' equivalent of blue services, were introduced, it would be logical that the criterion of 'full cost recovery including environmental costs' also applies to blue services. This would mean that both positive and negative *imponderabilia* of blue services would be expressed in monetary terms. However, since for many *imponderabilia*, no standardised valuation methods exist yet¹⁵¹, this may cause a problem in the economic evaluation of the effects of blue services. The same could be argued for agricultural practices in areas for blue service arrangements. This situation strongly relates to the debate about the property rights of agricultural entrepreneurs. As long as the valuation methods have not been standardised and (fully) institutionalised, basing the choice and design of instruments and blue service arrangements on economic evaluation methods will not lead to integrated approaches in water management.

Political criteria

With regard to factors influencing the decision-making about blue services, Van Bommel et al. remark that both farmers and water managers probably not only consider the rational cost benefit balance of blue services, but also their vision on issues like farming, specific implementation of water management or nature management tasks and the way to manage the rural area. In general, landowners and users need to see 'good perspectives' (i.e. good business perspectives) for the new land-use approach. This does not only require technical measures, but also clear communication and binding agreements for a long period of time. In other words, societal acceptance and emotional willingness of suppliers play an important role in the success of blue service-arrangements. Therefore, the introduction of blue service arrangements would require the application of a programme of suasive instruments

¹⁵¹ If they would exist, *imponderabilia* would no longer be *imponderabilia*.

(information and communication) besides negotiations about the financial and legal aspects of the arrangement. From an economic perspective, such a programme will enhance transaction costs on the short term. On the long-term, however, this programme may reduce transaction costs, since it may also bring about a paradigm shift among farmers which facilitates water management arrangements according to the principles of integrated water management.

Sustainability

As was argued in chapter 1, sustainability is an important aspect of integrated water management. Some blue services explicitly aim to have a positive effect on the long-term (such as building water reserves for nature and human use, countering subsidence, desiccation and salinisation and providing for good water quality), thus operating according to sustainability criteria. Other blue service measures are more reactive in nature and directed at benefits (in the form of prevention of costs/damage) on the short term (such as peak storage). The latter type of blue service is therefore less sustainable in nature. This can be explained by referring to the trypich 'retention, storage, discharge' as formulated by the *Commissie waterbeheer 21e eeuw* (2000). The first group of blue services falls in the category of 'retention', while the second group falls in the category of 'storage'. In principle, retention scores higher on the sustainability ladder than storage, since it is preventative in nature, rather than reactive. Since the effect of structural measures will become visible only on the long-term, choosing for blue service arrangements (and other water management arrangements) that are sustainable in nature will require a strong water management vision. In other words, a water management vision is needed that prevents opportunistic behaviour with regard to the types of water management measures to be taken or to be abandoned.

Vision about water management for the long-term can be derived from policy documents issued by higher tiers of government, such as the EU and the national government, and the policy principles, programmes and instruments formulated at those levels. From the analysis of studies and pilots of blue service arrangements as described in this subsection, the impression rises that actors involved in the organisation of blue service arrangements do not always operate according to these sustainable visions. Probably, the task of keeping the long-term perspective in mind and to focus the attention of (local and regional) primary actors on this long-term perspective would lie with higher tiers of government (national and provincial). At present, this sustainable perspective seems to be represented strongest by environmental and nature NGOs. However, these organisations are often not a primary stakeholder in blue service arrangements (unless they are landowners or managers) and may therefore have a limited influence on the outcome of negotiations.

Innovation

According to theory, innovation among farmers can be stimulated by financial incentives and output oriented goals in the contract. Security for farmers about their income from blue services (long-term contracts) can stimulate a shift towards more sustainable (integrated) agriculture. However, some studies expect that blue services will mainly serve the achievement of societal goals in water management (in a cost-effective way) and are not expected to lead to substantial income for farmers and a substantial switch to sustainable agriculture. This may limit the acceptance of blue services by farmers and thus their application in practice.

Conclusions

Advantages and disadvantages of blue services

The combination of voluntariness and business opportunities is expected to lead to much larger stakeholder/target group support than traditional CAC-instruments in water management. Combinations of land use functions in areas providing blue services have the potential of meeting various societal demands towards rural areas at the same time. Another potential advantage of blue services is that it may offer opportunities to unite classical conflicting interests in rural areas.

The main disadvantage of blue services is the reduced possibility for traditional agricultural practice. In order to engage in blue service arrangements, farmers take as a starting position that they need to be at least as well off as in case of continuation of their traditional farming practice. As a consequence, the existing institutional framework (including the existing distribution of property rights) is taken as a point of reference for determining which activities are blue services and what compensation/price should be paid for the blue services. Landowners/farmers are inclined to have a broader definition of what activities should be compensated for by demanding parties than other actors, such as environmental NGOs, and higher tiers of government, such as the EU, the central government and in some cases also provinces. The concept of 'good agricultural practice' is an important institution in the determination of which activities are blue services and which are blue duties. As long as blue services are not common practice in agriculture, a lot of effort will have to be put by all parties into jointly demarcating the boundaries of blue service activities. Since blue service arrangements will be settled in (voluntary) incomplete contracts, a lot of effort will also need to be put into getting agreements about all the terms in the contract. Therefore, as long as blue service arrangements have not been standardised, this approach will be accompanied by substantial transaction costs. In order to overcome these obstacles, such initiatives may be financially supported by (higher tiers of) public organisations or they could be stimulated by changing the rules of the game, as was suggested in the discussion of institutions for arrangements based on the discourse 'water as a service'.

Stimulating and obstructing factors

The adaptations in management practice of farmers in the bio-industry (according to the Reconstruction act) may offer a good opportunity to introduce blue services. The SGR2 stresses the need and opportunities for combining measures for increasing safety and decreasing water nuisance with improving water quality, fighting desiccation, reconstruction of rural area and strengthening the EHS (in short: function combinations/multiple land use planning). Because of required investments by both demanding and supplying party/-ies, long-term contracts in general are preferred to short term contracts, because they reduce financial risks for all parties involved.

Threats to the success of blue service arrangements may lie in the fact that collective arrangements (which are preferred from the perspective of (cost-)effectiveness) may conflict with the precondition of voluntariness. This situation is reinforced by the fact that water boards have limited influence on other stakeholders, especially landowners, since existing instruments and authority are not sufficient to force others to co-operate. In other words, water boards have limited possibilities to apply existing instruments as a stick (*stok achter de deur*) in case negotiations about blue services fail. Therefore, the success of blue service-

arrangements depends on the co-operation of other stakeholders. As was argued before, a major part of the attention in the process needs to be directed at this aspect.

Finally, and perhaps most crucially, government authorities paying farmers for blue services may conflict with EU-framework regulations for competition on the EU-internal market. The judgement by the EU whether or not these types of arrangements conflict with EU regulations regarding government support (to agriculture) forms a major risk factor for the success of blue services. Despite good intentions and successful pilots at the local level and a supportive attitude at the national level, rejection by the EU may lead to stagnation of this potentially successful new approach in water management.

5.4.6 PUBLIC-PRIVATE PARTNERSHIPS

INTRODUCTION: PUBLIC PRIVATE PARTNERSHIPS AND THE THEORETICAL DIFFERENCE WITH BLUE SERVICES

Another type of new institutional economic approach in water management is the construction of public private partnerships (PPPs). PPP-constructions are defined as 'an agreement in which there is 1) interaction between public and private parties that is voluntary, but not free of obligations 2) via an allocation of authority and costs/risks 3) aimed at synergy in the division of convergent goals 4) with both societal and commercial characteristics 5) under the condition of the preservation of each party's identity and responsibilities' (Kouwenhoven, 1991; Ernst & Young Consulting, 2000). This definition contains a number of preconditions for a potentially successful PPP-arrangement. Other preconditions are discussed below (Kouwenhoven, 1991; Akro Consult, 2000). Both authors mention as other preconditions or key characteristics: *mutual dependence*, (open communication of) *individual motives* and *deployment of (actor specific, unique) resources*. Finally, the *allocation and control of risks* can play an important role in the feasibility of a PPP-construction. These conditions will be discussed in various parts of the discussion of the theoretical perspective below. The starting conditions are based on theoretical insights. This, however, does not mean that they are 'objective characteristics' of PPP-arrangements that should be taken as given facts that fall outside the realm of discourse.

At first glance, PPP-constructions are very similar to blue service arrangements. The main difference is condition 3), the 'synergy in the division of convergent goals'. Whereas in blue services the demanding and supplying parties usually have different goals and interests, in PPP-arrangements, the overall goal is a joint one. By realising this goal, individual (and mutually different) goals of both public and private parties can be achieved. According to Van Bommel et al. (2003), a blue service is not a PPP, since in the former, the goals of public and private actor(s) are not realised in concerted action. Besides this central criterion, a number of other differences exist, which are less distinctive. They are more a matter of difference in the degree to which the criteria, as follow from the elements in the definition of a PPP or a blue service, are fulfilled. Blue services only partly meet all conditions for PPP. It does not completely meet condition 1), since not in all cases the service offered will be completely voluntary. It does not completely meet condition 2), since costs and risks are not equally divided between the parties involved. It does not completely meet condition 3), since there

may not really be an advantage for the private party (damage/costs may be compensated partly or at break-even), and therefore condition 4 is not completely met either. Condition 5) will be met to a large extent in most cases.

CHARACTERISTICS OF PPPs (THEORETICAL PERSPECTIVE)

Meso-level

Informal institutions

According to Van Bommel et al. (2003), the primary pre-condition for a PPP in water management is the presence of a demand for water services. The next step in assessing potential feasibility of a PPP-construction is based on the starting conditions as will be explained in the paragraph about technical criteria (micro-level dimensions). Then, the potential arrangement has to be tested with regard to administrative and legal aspects, and the distribution and control of risks. The administrative aspects will be discussed here, the legal aspects will be discussed in the paragraph about formal institutions further below.

Administrative aspects: division of roles and tasks between public organisations

According to Van Bommel et al. (2003), administrative aspects of PPP-projects for water storage are of great importance for the success of the project. These aspects relate to the division of roles between public parties and the distribution of authority and instruments. In the light of the trends towards deregulation and subsidiarity, government agencies are reconsidering and redefining their position towards lower tiers of governance and private organisations. Higher tiers of government want to maintain some degree of control over these lower tiers of government and private actors, in order to be able to steer and control the implementation of policy and the societal activities addressed by these policies. The national government will therefore increasingly play the role of the authority framing the activities of lower tiers of government and private organisations and leaving the implementation and enforcement of policy to lower tiers of government. In other words, they set the boundary conditions for activities of these actors. PPP-projects, in general, have a regional or local character, which, in line with deregulation, makes it logical that provinces or municipalities are the (public) initiators of these projects. According to Van Bommel et al. (2003), in case the project surmounts municipal borders, the province will be the right 'director' of the project, since she will be better able to balance all interests than one of the participating municipalities. In case of local projects, the municipality is judged to be the best director. This approach fits the subsidiarity principle, which states that policy should be implemented and enforced by the lowest level of government possible. Other arguments for leaving local projects to the discretion of municipalities is that these organisations often have experience with the management of PPP-projects. Moreover, municipalities often have development companies (*grondbedrijven*) they can activate in the PPP-project.

Water boards will often play an initiating role, since they have the task to structurally adapt the water system to prevent water nuisance in the future. Besides an initiating role, the water board has a substantiating role in the design process. As manager of the water system, she can substantiate the claim for space for water storage, as well as the locations where, reasoning from the perspective of the water system, water storage is effective. In the latter 'act of substantiation', the 'map for water storage opportunities' (*waterkansenkaart*)

can be a useful instrument. For these reasons, Van Bommel et al. (2003) argue that water boards should always be involved in PPP-projects for water storage at the regional and local level.

Risks and uncertainty

In many projects, co-operation between public and private parties is started with the aim of sharing and controlling risks. Ernst & Young consulting (2000) distinguish commercial and administrative or policy related risks. Commercial risks relate to the question whether or not there is a market and the estimation of the costs against which the objects can be realised and which revenues can be generated. Administrative and policy related risks, amongst others, relate to the risk that the composition of the municipal government changes during the project and that problems arise with regard to procedures for a change in the development plan or with regard to public hearings.

In almost all PPP-projects, public parties concentrate on controlling administrative and policy-related risks. In the PPP-contract, it is laid down in what way extra costs of for example extra public hearings are dealt with. Private parties usually concentrate on controlling commercial risks, since in general, these parties can better judge and control these risks than public parties can. The overall goal is to minimise total risk of the project. Decreased risk can also lead to the acceptance of lower return on investment, since the risk premium will be lower. This results in the situation that a project will sooner be judged economically feasible.

Formal institutions

Legal aspects

Governments have at their disposal legal instruments to frame the spatial planning process, such as (municipal) development plans, (provincial) regional plans (*streekplannen*) and water management plans (water boards, and since recently also municipalities and provinces), in which the required water storage capacity can be laid down. At a higher level of governance, European regulations regarding tendering play an important role, since public authorities have to comply with EU-guidelines for public tendering for projects with an estimated budget exceeding 6 million euros. These regulations mean that envisioned private parties would not automatically get the assignment to engage in PPP-arrangements. According to Van Bommel et al. (2003), this would be disastrous for implementation of PPP-arrangements. As was described before, building trust between actors involved in a PPP-arrangement is a crucial aspect for its success. EU regulations for public tendering are likely to increase uncertainty about the arrangement (and (therefore) transaction costs).

In the construction of a contract, it is important that the rights and duties, goals, roles, tasks and authorities of all parties are laid down in a transparent way. Besides, clear procedures need to be established for the procedure in the case of a possible disintegration of the PPP. With regard to water storage, a number of aspects will have to be laid down:

- The required storage capacity. This should prevent that storage capacity is sacrificed for other functions (defending the public (water) interest) and vice versa (defending private and other public interest);
- The compensation scheme. This should prevent that various parties 'abuse' the storage capacity for personal (financial) gain. Use frequency and duration relate to this;

- Decision authority for the use of an area for water storage. This will depend on the type of storage.

In PPP-constructions, both public and private legal rights play a role.

Contracts: types of PPPs

Two main forms of PPP are being applied in practice so far: *joint ventures* and *agreements based on private law*. In a joint-venture, public and private parties form a new legal entity. This construction is often used by municipalities for urban development. In this thesis, this type of PPP will be referred to as type-1 PPP. In an agreement based on private law, no such new legal entity is formed. The agreement is a legal contract between two or more separate legal entities (public and private). This type of PPP will be referred to as type-2 PPP. According to Van Bommel et al. (2002), public interests can better be anchored in a PPP in case of a private agreement than in case of a joint venture. The interests of a joint venture can change in time and do not necessarily run parallel with public interests. In the type-1 arrangement, water management is usually just one of many functions the area is to fulfil. In the type-2 arrangement, water management is often one of the main functions the area will fulfil, besides existing land use function(s). In general, in the type-2 arrangement, the total number of functions the area will fulfill will be lower than in case of a type 1-arrangement.

Type of contract

In chapter 2, in the discussion of contracts, a number of categories of contracts were distinguished (complete contracts, incomplete contracts and relational contracts). It can be questioned in which category of contracts PPP-arrangements fall. In the joint venture-type of PPP, a new legal entity is formed in which both public and private parties participate. In these situations, it can be argued that the PPP-arrangement falls in the category of relational contracts. On the other hand, however, PPP-constructions are usually engaged in with the purpose of jointly executing a specific projects, within a specific time frame, and with the intention to dismantle the legal entity when the project has been realised. Relational contracts, as described in chapter 2, are usually intended for very long-term relationships (over 20 years). The execution of most projects does not last that long. PPP-arrangements, because of their complexity, certainly are no complete contracts. Therefore, it can be concluded that a PPP-arrangement is usually (or even always) an incomplete contract.

Policy instruments

Based on the results of the study by Habiforum (2002), Van Bommel et al. (2002) investigated various policy instruments for PPP:

- In case of a *contract for zonal development*, the concerted parties develop a water storage location that is attractive for private actors. Both public parties (water managers) and private parties (project developers and others) can benefit from this co-operation;
- In case of a *water storage-fund*, private and public parties donate money into a fund that finances water storage locations. This instrument may well be combined with the *contract for zonal development*;
- *Commercial exploitation* and *management agreements* relate to the phase after the realisation of a project. The first assumes a profitable management, in which water storage is included as a function, while the second requires a compensation for land management measures for water storage. The assumption in this situation is that

management by a private actor can be done in a cheaper way than the water board can do it herself.

Actors, motives, strategies and resources

Actors involved in PPPs

Obviously, PPP-arrangements involve public and private parties. The public party can in principle be any party that wants to undertake a project and wants to involve private parties in this project. The private parties can be any party interested in project development or commercial exploitation or parties that are needed by public parties for the realisation of their project. The most important ones in relation to water storage are: landowners, investors and utility companies.

Motives for engaging in PPPs

In short, motives for public parties to co-operate with private parties are that the latter can create added value by introducing knowledge of the market and efficiency. Motives for private parties to co-operate with public parties are perceived commercial advantages and the value of a good relationship with public authorities. When analysed in more detail, motives for PPP can be categorised into two broad categories (Kouwenhoven, 1991): financial-economic and administrative-strategic motives. Possible financial benefits of water storage projects for private parties are mineral exploitation (sand), and recreational or residential exploitation of a water body. Often, however, the financial aspect is not the central motive for initiating partnership, but rather aspects like knowledge exchange and mutual tuning. These motives belong to the administrative-strategic category. Administrative-strategic motives for the government originate from a re-orientation of governance since the 1980s (see chapter 2: political modernisation) (Kouwenhoven, 1991). PPP should lead to more effective and efficient public management. Another motive for public parties to engage in PPP is to generate *added value* to public investments. Administrative-strategic motives for business are maintaining an adequate relationship with government authorities (Kouwenhoven, 1991). By co-operating with public authorities, business can anticipate on the influence of the regulating and intervening role of the government. Other expected advantages are competitive advantage, a speeding up of permit procedures (such as a modification of the zoning plan) and gaining insight in the operating strategy of governmental organisations.

The larger the added value of water for another land use function (its amenity value), the easier a PPP-construction can be established. The reason for this is that in PPP-arrangements, provitable private land use functions (co-)finance non-provitable, public land use functions. If the added value of water for the private land use function is large, it is easier to strike a deal between public and private interests.

Strategy

A water board has three options for taking water storage measures. These options can be arranged in a priority order. First, the water board will see if it can arrange the water storage facility itself. Especially if a facility needs to be used for water storage often, water boards will choose this construction. However, water boards do not have sufficient financial means to realise all water storage assignments themselves. The next option is considering the possibility to provide for water storage via a blue service. This can be more easily arranged than a PPP-construction. A next option is a PPP-construction. In case of a combination with

existing functions such as agriculture or nature, the construction will often concern the fight against desiccation or water supply, since the existing function will benefit from it too. The water storage type will be building reserves or seasonal storage. In case of new functions, such as living/working, recreation and nature, water storage can be introduced as a precondition for realising other functions, since the realisation of other functions depends both on changing the spatial development plans and on the water test.

Resources

Public parties especially have legal authority they can apply, such as alteration of development plans. The water board has knowledge about the locations where water storage can or should be achieved. Private parties have money, land and knowledge about project development as their most important resources. The latter especially applies to the arrangement for living/working and recreation. Agriculture and nature have knowledge about land management and (location specific) water storage.

Discourse

The position of PPPs in various discourses about water management

In the introduction to spatial approaches to water quantity management, three categories of discourse were presented with regard to the way water management should be arranged (normative discourse). These were 'water as a condition', 'water as a service' and 'water as a product'. Below, I will discuss what story lines about (institutions for) PPP-arrangements for spatial water quantity management can look like to fit these arrangements in each of the discourses.

Water as a condition

Ideas for rules of the game that would allow for PPP to fit into this discourse

An example of a rule for a PPP-arrangement to make it fit this discourse could be that water management measures would only be allowed if the ones that suffer from the measure would be compensated by the ones that benefit. This involves striking a deal between functions: functions for which conditions improve co-finance functions for which conditions deteriorate. Seasonal storage and strategic reserve building fit well in this discourse. For this purpose, clear priorities have to be established, and some functions, especially agriculture, may have to be reduced or even abolished. The traditional approach of agriculture is the other way around (water serves agriculture), but if the condition of compensation is fulfilled, farmers may be willing to consider water storage.

Water as a service

As was mentioned before, 'water as a service' primarily means that the societal interest of water is emphasised. According to Van Bommel et al. (2003), the concept of water as a service (or 'water services') receives attention in two different circles (policy coalitions), each with his own discourse regarding the concept. On the one hand, representatives of agriculture and horticulture stress the contribution farmers and other landowners can make to water management. On the other hand, policymakers for water management, such as the EU and the Ministry of V&W stress the services offered by water management to other social and economic activities. These two coalitions differ with regard to the way 'water as a service' should be filled in. Therefore, the rules of the game for PPP-arrangements presented by these coalitions differ as well. The first coalition presents as a basic rule that if a landowner or user makes his land available for water storage, he supplies a water service to

society, for which he may receive a payment, the height of which is based on the importance of the service. The second coalition emphasises the environmental costs associated with water management that is tuned to a specific land use. According to this coalition, these environmental costs should be compensated according to the polluter/user pays principle. These coalitions are similar to the ones identified for blue services.

Ideas for new rules for PPP

Solving the differences in perspective as presented above requires an agreement about the distinction between standard agricultural practice and extra activities. Van Bommel et al. (2003) state that these differences in opinion could be brought together if for each hydrological unit it is decided by water boards, in co-operation with landowners, in which locations water should be retained or stored. The demarcation of specific areas makes clear which areas are 'special' and which are 'normal'. The landowners in the special area may be paid for their water management services, the resources of which are retrieved from the ones benefitting from the services (the inhabitant of the hydrological unit). On the other hand, the landowners in the normal areas are charged for water management that enables specific types of land use. This approach is comparable to that of 'good agricultural practice' as discussed with regard to blue service-arrangements.

Water as a product

Ideas for new rules for PPP

- landowners or users formulate and settle a contract for the supply of water to a customer. The landowner/user has his own responsibility for water management and makes his own decision about applying water for his own use or supplying water to others;
- facilitating the introduction of new functions in an area, that enable converting water management into a profit. This means for example changing the development plan or subsidising pilots.

Options for water storage by means of PPP: discourse about multiple land use

Just as with blue services, in case of PPP for water storage, one can speak of multiple land use. PPP arrangements for the rural area are considered especially interesting for the combination of land use functions (PPS Bureau Landelijk Gebied, 2002). In fact, according to Van Bommel et al. (2003), water storage can only be achieved on a large scale if the space needed can be used for other forms of use as well, because of the scarcity of space in The Netherlands. Besides the function of water storage, the soil will be used for at least one other land use function, such as agricultural use, nature, living/working or recreation. Four forms of multiple land use are distinguished by Van Bommel et al. (2003):

- intensifying land use;
- weaving (combining) functions;
- utilising the third (vertical) dimension;
- using the fourth dimension (flexible/varying use in time).

The combination of functions aims at creating more opportunities for spatial quality of green, blue and other (i.e. commercial) functions, sometimes at creating strict buffers between nature and other (urban) areas, and especially at financial balancing of profitable (commercial) and non-profitable (public) aspects of a development plan. PPP-constructions are especially feasible if private and public functions reinforce each other. Possibilities for

multiple land use strongly depend on the location and frequency of inundation of the retention/storage area.

Summary of theoretical aspects of PPP-arrangements

In this paragraph, the aspects of PPP-arrangements were discussed from a theoretical perspective. This discussion leads to a (theoretical) list of factors for success or failure of PPP-arrangements for water storage, combined with other land use functions. These are presented below. Based on the discussion of various aspects of PPP-arrangements from a theoretical perspective, Van Bommel et al. (2003) formulated a number of ideal-type arrangements for the various types of water storage distinguished (storage for building reserves, seasonal storage, peak storage and emergency storage). These ideal-type arrangements are discussed by the authors with regard to their (hypothetical) added value (the criteria for which are based on the theoretical preconditions of mutual dependence and convergence of goals) and the actors involved (divided into suppliers and customers). As was argued in discussing blue service arrangements, these ideal-type arrangements can reduce transaction costs and as such lower the threshold for constructing and implementing them.

Factors for success and failure

Factors for success

The main factors (pre-conditions) for the successful use of PPP as a policy instrument as mentioned by Van Bommel et al. (2003) are:

- PPP should lead to added value;
- Public-public co-operation;
- Open communication and mutual trust;
- Optimisation of scope: the partnership should not contain too few and not too many parties;
- Contracts for the division of tasks and risks.

Factors for failure

Main factors that can lead to failure of a PPP are:

- Preparation and organisation;
- Project demarcation;
- Selection of partners;
- Co-operation;
- (Commercial and political/administrative) Risks;
- Mutual prejudice and unfamiliarity.

(Van Bommel et al., 2003; Innovatienetwerk, 2002)

EXAMPLES OF REAL PPP-ARRANGEMENTS

Introduction

In this paragraph, an actual PPP-arrangement including water storage will be described. Experience with PPP-constructions for the rural area is being generated through a number of projects, such as the reconstruction of the industrial farming sector and the concentration of greenhouse horticulture. For the study by Van Bommel et al. (2003), four cases combining water storage with other land use functions were tested with regard to their PPP-policy

arrangements. These cases came forth from the study *Meervoudig Ruimtegebruik en Waterberging in Noord-Holland* (multiple land use planning including water storage in the province of Noord-Holland), published by Habiforum¹⁵² in 2002 (Habiforum, 2002). This study described several combinations of functions for various types of water storage. The study showed that water storage can be combined with agriculture, nature, recreation and living, provided that substantial adaptations are made to the planning of the area. Van Bommel et al. (2003) analysed the cases by means of policy arrangements theory. This analysis led to advice about PPP-constructions with good opportunities for several combinations of land use functions and water storage services. The cases analysed by Van Bommel related to the contract types of 'commercial exploitation' and 'management agreements'. These cases will not be analysed here, since this would result in repetition of analysis. However, results of the study will be used in the meta-analysis in chapter 7. For a description of the cases, I refer to Van Bommel et al. (2003).

The PPP-arrangement that will be described below is the project *De Blauwe Stad*. The Blauwe Stad-project is typically a PPP involving an 'area development contract'. It concerns a large project to revitalise a rural area in the north of the country that has been in a downward economic spiral for decades. The project involves various land use functions, most of which are new, such as new residential areas, nature, water for storage and recreation, and some of which are existing, such as existing residential areas and agriculture. The data for this arrangement were obtained from secondary material (articles, brochures, internet data) and interviews with the director of the Public Private Partnership and the district manager of the water board responsible for the project from a water management perspective.

PPP-arrangements for area development: De Blauwe Stad

Introduction

The Blauwe Stad-project in the province of Groningen is a spatial planning project that has received a lot of attention in recent years. Much of this attention can be ascribed to the fact that within the context of this project land (former farmland) is being turned into a lake, mainly for recreational and tourstic purposes. Turning land into water runs counter to the Dutch tradition and has so far not been performed in The Netherlands. The idea of the *Blauwe Stad*-project was developed with the purpose of revitalising an impoverished area. The general idea was to change the land use function from marginalised farm land into land use functions that would accommodate 'new' economic drivers for the rural area, such as recreation and tourism. These land use functions were typically 'nature' and 'water'.

The idea for the Blauwe Stad-project was initiated in 1988 by the district manager of the department of Forest- and Agricultural Development of Staatsbosbeheer (the state forest management service) in the eastern part of the province of Groningen, named Haaskens. Much of the agricultural land in his management district was left fallow by farmers. For each hectare of land left undeveloped, the farmers received a sum of money from the national government. This way, they contributed to reducing agricultural surpluses. If they did cooperate with this regulation, EU-support for their other activities would be withheld. The district manager was involved in the planning of the 'reconstruction' of Oost-Groningen (the

¹⁵² Habiforum is a network organisation for multiple land-use planning (see www.habiforum.nl).

eastern part of the province) and wondered whether the money available from higher tiers of government could not be used in a such a way that the whole region would benefit from the money, and not just the farmers. He then conceived the plan to inundate a low area in the middle of a ring of villages, which would create all kinds of opportunities. He contacted the Ministry of Agriculture, Nature management and Food quality to see if they were interested in the plan, since the policy to reduce the area of arable land in Oost-Groningen and the peet colonies on the border of the provinces of Drenthe and Groningen by 6400 hectares originated from this Ministry. However, the Ministry did not want to reduce the area of land as drastically as proposed in the plan. According to the Ministries policy, only 300 hectares of land could be withdrawn from agriculture in the area under study (*Oldambt*). A local architect, Timmer, however, proved to be enthusiastic about the plans and together, they continued developing the idea.

Considering the social-economic problems of the area (unemployment, emigration, ageing, fallow land, deteriorating public facilities), politicians at several levels of governance had a positive attitude towards the plan. In 1991, the Minister of VROM launched the idea to improve *leefbaarheid* ('liveability', quality of life) in six areas in The Netherlands, including the Oldambt. As part of this idea, a development-plan had to be made. The initial idea for the lake in Oldambt emerged again in this context. The area under study originally was a high moor area. In a later stage, it was excavated for peet, which was used as a fuel. These excavations resulted in a lake, which in a later stage, due to improved drainage techniques was turned into farmland. The soil in the area is less fertile and less elevated than surrounding areas, which made it a suitable location for a lake.

Macro-level analysis (exogenous factors)

In the discussion of macro-level developments regarding the *Blauwe Stad*, I will take the regional level as a starting point. The reason for this is that the main factors leading to the development of the *Blauwe Stad*-concept and eventually the PPP-arrangement were regional in scale.

Political constellation

In the initial stage of development of the plan, many residents of the region were sceptical. As was indicated in the introduction, the region had been a productive and wealthy agricultural region for a long time. This wealth, however, accrued to a small part of the population only, namely to the large landowners (*heerenboeren*). For the hired farm workers and people performing other 'derived' occupations, live was hard. Because of this marginal existence and the large contrast with the large landowners, many of the farm workers were member of the Communist Party. Initially, the *Blauwe Stad*-project was regarded as a project for the wealthy people, which would not change the situation for the less well to do, or would even deteriorate their situation.

Meso-level analysis

Informal institutions

Goals of the project

With the execution of the *Blauwe Stad*-project, a number of new land use functions will replace the former land use function of agriculture. These functions are nature, water and residential areas. With regard to nature, the project will add four square kilometers of ('blue'

and 'green') nature to existing nature in the area. By realising the nature in the Blauwe Stad-project, existing nature, separate parts of the national ecological main structure (*EHS*), will be connected. People will be allowed to live and recreate in the new and existing nature and on the lake. The lake will also be used for additional water storage. This additional storage refers to storage of water that does not originate from (i.e. precipitate on) the project area. The water will be connected to existing water bodies to create an interconnected system of water ways for recreational purposes.

Residential areas were introduced into the project goals to make the project profitable. In the initial stages of development of the concept, no residential areas were planned. However, soon it was concluded that the project was not economically feasible if recreation would be the only economic driver of the plan. In that form, the concept received a lot of critique from inhabitants of the province and from political and administrative parties involved. As a consequence, the concept was redeveloped in a later stage to include residential areas. By including the (highly profitable) land use function of housing, the project became (more) economically feasible. This profitable land use function (often referred to as 'red'), could even finance the realisation of less profitable public facilities, such as (blue and green) nature, infrastructure and water for storage.

Strategy for the planning process and communication

According to the director of the PPP-consortium, large spatial planning projects like the *Blauwe Stad* are often presented as 'untouchable'. The director, however, holds the opinion that, in order to create public support, the initiators of such projects should take an 'as vulnerable position as possible'. Taking this position is not always easy in (legal) spatial planning procedures, since inevitably, planning decisions will be taken that are not supported by all residents. The description of the way the PPP-consortium deals with the interests of various (secondary) actors hints at the general trend towards 'open planning' (*open planprocessen*), which can be regarded as a specific form of deregulation. In this type of planning, government authorities do not impose a project as the main representative of public interests, but rather act like an equal partner or facilitator in the planning process. For a more detailed description of various relationships between government agencies and other actors in policymaking processes, I refer to Van Ast and Boot (2003).

Formal institutions

Legal framework

EU-regulations may be important for the arrangement from a number of angles, such as general laws, regulations and policy for nature, water and rural areas and laws. A framework of laws and regulations especially relevant for the project are the rules regarding public tendering and state support of large infrastructural projects in a 'free' EU-internal market. Regulations regarding state support impose limitations on the types of activities and the economic sectors that may be supported and the duration of the support. However, in the analysis of the *Blauwe Stad*-arrangement, this aspect was not analysed in depth, since it did not emerge as a crucial issue in the establishment of the arrangement.

According to the director of the PPP-consortium, the consortium tries to include as many interests as possible in decision-making related to the design of the project. At the same time, however, he indicates that the realisation of the project itself is irreversible. A number of legal procedures have been performed regarding the plan as a whole and parts of the

plan, which act as (indisputable) legally enforced landmarks for the design of the project. These procedures relate to the regular process for spatial planning, including public hearings, public notification of the plans, voting by the municipal council and legal procedures resulting from formal objections. Apart from the legally founded land use purposes, the design of the project area itself is laid down in plans that often have a less strict legal basis. Some aspects of the design, organisation and execution of the project are regulated via public law (such as *'beeldkwaliteitsplannen'* (visual quality plans)), others by private law (such as contracts between project developers and future residents regarding the transfer of property rights of land and the related conditions). Objections to these elaborations of the zoning plan can be based on general spatial planning principles such as *'proper spatial planning'*. Which (elements of) spatial plans are *'proper'* and which are not is a matter of jurisdiction and precedents.

Organisation of the arrangement

Financial input into the project comes from governmental organisations, such as the national government, the province and the municipalities involved and from private investors. The public organisations invest a little short of 35 million Euros in the project (in the form of co-financing or subsidies), for the realisation of public facilities. The remainder of the investments and all risks involved in preparation and development of the area will be accounted for by the private parties in the PPP. The initial plan mainly involved public organisations and public land use functions. This plan was developed in a period (the 1980s/beginning of the 1990s) in which the assumption was that recreation and tourism created a lot of structural employment. However, according to the director of the consortium, it showed from previous projects that such plans are only feasible if you can come up with a direct financial cover. In other words, such projects need an entry that generates a return on investments on the short term. According to the director of the consortium, this is a precondition to get private investors interested in spatial planning projects. For this reason, the land use function of *'residential area'* was introduced in a later stage. With the introduction of this function, private investors became interested and involved and gaps in the public cost-benefit analysis could be (partly) filled. It was decided to opt for owner occupied houses, and not for rental houses. Besides the direct revenue from selling the land, there is another advantage to owner occupied houses over rented houses, namely the fact that owner occupied houses are a stabilising factor in the socio-economic structure of a region, since house-owners are not inclined to abandon their property as easily as house renters are. This argument also played a role in the debate between advocates and opponents of the project and of realising only owner occupied houses within the project. Opponents feared that with the construction of owner-occupied houses only, the project (and the related investments of public financial resources) would only benefit the rich that could afford to buy a house in the project area.

During the preparations of the project, it also became clear that a *'closed soil balance'* had to be achieved in order for the project to be financially feasible. The surplus of soil that resulted from excavation of the lake could be used for preparing the plots for houses and the foundations for infrastructure. Besides, a large volume of soil would be needed for the construction of dykes. These dykes would have to be built higher than initially planned, since the water board expressed the desire to use the lake for the storage of extra water. The costs of measures to accommodate this extra water will be borne by the water board.

The public facilities of water, nature and public infrastructure (dykes, roads, sewers, etc.) will be developed in the first phase of execution of the project. Realising these public facilities in the first phase of the execution guarantees that these facilities will indeed be realised. This takes away the risk that the profitable land use functions (residential areas) will be realised first and that the public facilities in the end will not be realised at all. In the second phase, residential areas will be prepared for building (*bouwrijp gemaakt*). After that, houses will be built.

Water and nature

With regard to the water system, a distinction needs to be made between construction and maintenance. The costs of constructing the system according to the minimum specifications needed for having a properly functioning water system for the project area itself will be borne by the PPP-consortium. Maintenance of the water system in the project area is a responsibility of the water board, and will therefore be performed by the water board and be financed through regular financing mechanisms of this organisation. During the development of the *Blauwe Stad*-concept, the water board expressed the desire to use the lake for occasional storage of external water to relieve the secondary water system (*boezemsysteem*) outside the project area (so called 'external water'), if need be. The storage of external water is considered an extra activity, which does not fall within the category of 'good' or 'standard' planning practice, for which the initiators of the project would be responsible. Therefore, the costs for realising and maintaining all facilities (adaptation of infrastructure) needed to accommodate water level fluctuations for this purpose, will be borne by the responsible water manager (the water board of Hunze en Aa's). The disposition and use rights of the areas with open water will be transferred '*om niet*' (for nothing) to the water board. According to the director of the consortium, in this respect the province (primary actor) and the water board (secondary actor) are somewhat overlapping organisations, since they have similar interests from the perspective of water management (the achievement of water related policy goals).

The area of the lake and the height of water level fluctuation (together determining the total capacity for (extra) water storage) were not based on the water storage function, but rather on geographical and geological characteristics of the terrain. Thus, the natural characteristics of the area were decisive for the realisation of the water body. This principle comes close to 'water as a guiding principle for spatial planning', which is also based on the idea of trying to manipulate and control water systems as little as possible (over a long period of time). Besides the geographical characteristics of the area, a number of other factors played a role in determining the size of the water body, such as existing infrastructure and houses. Land with an existing land use purpose of 'housing' is more expensive than agricultural land. Therefore, the legal land use purpose (*bestemming*, as stipulated in the municipal zoning plan) was an important factor in determining the financial feasibility of buying land from private owners and thus for the establishing the total project area. Another important factor is the present use of agricultural land. Some agricultural activities generate more added value than others, and thus the land price may vary. Besides, the amount of compensation for the farmer selling the land to the project consortium is based on the added value of the agricultural activity.

Spin-off for the surrounding area

For the ring of villages adjacent to the project area, a separate project organisation was erected to address existing and new issues in this area. The project organisation formulated a programme in which existing and new projects for 'the ring' would be addressed in a joint manner. Within this programme, the project organisation, formed by the province and the three municipalities, formulated four themes for the 'ring': (transport and traffic) connections, spatial quality, facilities and new opportunities for development. With regard to the theme 'connections', it is argued that it is in the interest of inhabitants, businesses and tourists that the surrounding area should be easily reachable from the project area and that, vice versa, tourists can easily reach the project area. This also relates to recreational water transport. With regard to the theme 'spatial quality', the project organisation aims to cooperate with the parties involved to connect the villages in the ring to the lake that is created within the project area.

Contracts

According to the director of the PPP, important elements of the contract between the primary actors (see further below) are the activities to be undertaken, by whom they are to be undertaken, the costs of the activities, who pays for these costs and who bears the (financial) risks. As was mentioned before, in the Blauwe Stad-project, the (primary) public parties have bought off their financial risks. Any project costs that exceed the estimated budget will be borne by the (primary) private actors.

Policy principles

The technical design of the residential areas has been adapted to the possibility of water level fluctuation. As such, the project fulfills the criterion of 'water as the main planning principle'. The condition that houses would be adapted to the possibility of water level fluctuation in the lake was set by the water board. The storage of external water may cause some damage to real estate, but according to the district manager of the water board, the risk of this damage falls within the normal 'design risk' for water systems. This assessment was based on a risk calculation by the water board. The water board did advise the project organisation to adapt the houses to the possibility of high ground water levels or occasional surface water nuisance. If this advice is not followed, the PPP-consortium or house owners will be responsible for the consequences. Future residents will be informed about this responsibility. Besides, the consequences of living in the project area have been laid down in the zoning plan and the project organisation and the water board have made an agreement about including a paragraph about the water system and its (potential) consequences in the deed of purchase.

Policy goals

As was mentioned in the introduction of the arrangement, the main purpose of the project is (and always has been) the revitalisation of an impoverished area by introducing new land use functions and new economic drivers. During the course of the development of the plan, new policy goals were introduced from various angles. The development of the concept of the Ecological Main Structure placed policy goals for nature within an explicit framework, which increased the interest and support from specific public actors such as the province, the national government and the EU. This support within the context of a specific policy concept, however, also entails a number of conditions nature development in the project area has to

comply to. Another issue that emerged in the course of the planning process was water storage. Initially, the water board was involved as an advisor with regard to management of the water system in the project area, without having a specific interest (the district manager of the water board stated in an interview that creating a new water body *per se* does not contribute to achieving the water quantity policy and management goals of the water board). As a result of the developments with regard to water quantity management (excess and shortage), the water board formulated new policy goals and as a consequence developed a specific interest in the project in the sense of storage facilities for external water.

Policy instruments in the arrangement

In the interview with the director of the PPP-consortium, it was suggested by the author that the presence of water near the residential areas in the project plan might be explicitly expressed as a percentage of the house price. This extra value of water expressed in monetary terms could then be transferred to the water manager responsible for managing the water system in the project area. Methods have been developed for the valuation of the extra value of real estate as a consequence of the vicinity of specific facilities, such as nature. The most suitable method in this situation would be the hedonic pricing method. This method aims to compare the prices of real estate with and without the specific facility or characteristic. Via econometric analysis (o.a. compensation of disturbing factors), this method aims to single out the effect of the characteristic on the price of the real estate. Various studies have been published about this method (see for example Benson et al., 2000; and Luttik, 2000). According to the project director, however, the exact value of such an amenity in the environment of the real estate can never be established with full certainty and precision, and is therefore always an arbitrary matter. He argues that the purchase of a plot or a house is accompanied by such a large degree of emotion, and involves so many factors, that it is nearly impossible to single out one factor, such as the presence of a lake in the vicinity. He states that this subject is 'very difficult to approach in a scientific manner'.

A motive for public parties involved for not using valuation methods like hedonic pricing for the financing of public facilities is that the process of getting to an agreement about the distribution of costs and benefits within the consortium is a matter of consensus building, of giving and taking. In the case of the *Blauwe Stad*-project, negotiations between public and private parties in the consortium about the construction and maintenance of public facilities have focused mainly on construction. Maintenance of public facilities, including the water system, will be paid for by public parties. The construction of (standard) facilities is for a part paid for by the private parties, by using part of the (expected) profit of the real function (real estate) to finance non-profitable public facilities (such as green and blue land use functions) (pruning away profits). The ownership of the land for the realisation of real estate is transferred to these private parties, who, as part of the agreement, get the freedom to determine the price of real estate. At the same time, however, they also bear the risks of not selling the real estate (for the desired price). It seems that the public parties did not want to run the risk that the financial resources received by 'cashing' the amenity value of the houses might turn out to be insufficient to finance the construction (let alone maintenance) of public facilities. Or they might not have considered this option at all, since it is not a regular approach in The Netherlands. In the construction chosen in the *Blauwe Stad*-project, these risks are bought of in advance by making private parties co-finance public facilities.

For the water board, similar factors play a role in not 'cashing' the added value of water. The water board has a tradition of arranging their management tasks via command and control-instruments (laws and regulations and their enforcement). The water board for the project area has no economists in the organisation, other than financial administrators. Perhaps as a consequence, innovative financing mechanisms for water management, based on new paradigms, principles and/or discourses are hardly considered. Any financial agreements with private parties for management activities (such as blue services), are based on the discourse of 'water as a condition', or at most on 'water as a service' (but than from the perspective of the landowner), but not on 'water as a product'. The costs of maintenance of the water system within the project area are retrieved via a regular water levy, the height of which is based on the principles of cost recovery and user/polluter pays principle.

Actors, motives and interests

Primary actors

The '*De Blauwe Stad*'-project will be executed by a Public Private Partnership of the joint venture-type. The public parties in this PPP are the province of Groningen and three municipalities. The private parties are a consortium of three project developers. According to the director of the PPP-consortium, the motives of the private parties involved from the perspective of the financial feasibility of the project come down to the profit margin and for the public parties involved to realising the desired public facilities against the lowest public cost. Apart from 35 million Euros of government subsidies or contributions, the project has to be paid for by the revenue from selling plots to future residents. The balancing of public and private costs and benefits is one of the main aspects of the PPP-agreement. According to the director of the consortium, the private goals cannot be realised without public consent, and public goals cannot be realised without input of private resources. The project therefore meets the condition of mutual dependence of private and public actors.

The province of Groningen has a number of interests to be involved in the project. The original reason for being involved was the economic revitalisation of a part of the province by introducing new land use functions (and thus new economic drivers). During the development of the idea, another interest emerged, namely making the project area part of the *Ecologische HoofdStructuur (EHS; ecological main structure)*. The reason this interest emerged was the fact that the national policy for realising an ecological main structure in The Netherlands evolved and became more concrete along the way. The total of existing nature areas in the vicinity, the new nature areas of four square kilometers, and the new lake of eight square kilometers, sums up to almost 20 square kilometers of nature. According to the district manager of the water board, the province saw an added value of the water system for the functions of recreation, nature development and residential areas/living.

Secondary actors

The main secondary actors are the water board, for all issues in the project related to water management, Staatsbosbeheer (the 'state forest management organisation) and Groninger Landschap (a foundation for conservation of the landscape in the province of Groningen), for all issues in the project related to nature. Other secondary actors are inhabitants of the project area, inhabitants of the surrounding area, inhabitants of the province of Groningen in general, and the national government, especially the ministry of VROM, from the perspective of the ecological main structure, and the ministry of LNV, from the perspective of the socio-economic reconstruction of former agricultural 'core areas'. A motive for various public actors

to get involved in an integrated project such as the *Blauwe Stad*, is that in such a project large areas of land get a new legal purpose. Changing the legal purpose of a large area of land within the framework of a large, comprehensive planning project may generate opportunities of scale compared to changing the legal purpose of a large number of small areas, thus reducing the total duration and transaction costs of the process. This strategy is (amongst others) interesting for public actors that have to achieve political goals, such as the total area of nature (provinces, terrain managers such as *Gronings landschap* and *Staatsbosbeheer*) or the total area of water for storage (the water board).

In the region where the *Blauwe Stad*-project will be realised, a number of cases of local water nuisance occurred around the turn of the century. In reaction to this, the water board of Hunze en Aa's formulated a number of policy goals for water quantity management, mainly for expanding the room for water for the purpose of water storage. The realisation of the *Blauwe Stad* project, including a large lake, was a good opportunity for the water board to take a step towards achieving this goal.

A motive for the public actors involved in the PPP-consortium (province, municipalities) to introduce public land use functions such as nature and room for water (storage) may be the fact that land use functions that are high on the political agenda (at EU and national level) may result in subsidies for the realisation of these functions, and thus for the realisation of the project as a whole.

Subcontractors also have an interest in the project, but they are not likely to influence the decision-making process regarding the continuation and/or design and execution of the project. Consultancies are more likely to have a role in the decision-making process of the project, especially with regard to the process and the design (depending on the specialisation and role of the consultancy). Consultancies may be hired by the PPP-consortium or by other actors involved in the project, such as water boards. The PPP-consortium has made an agreement with the water board about construction and maintenance of the water system and the financing of these tasks. Part of the (research for the) design of the water system may be done by consultancies, just as (aspects of) project management. Collectives of actors are formed specifically for strengthening their position with regard to the (spin-offs of the) project. Examples of such collectives are the *NLTO* (agri- and horticultural organisation for the north of The Netherlands), existing entrepreneurs organised in 'het blauwe lint' ('the blue band') and new entrepreneurs organised in *Ondernemerschap Nieuwe Stijl* ('entrepreneurship new style').

Discourse

Normative discourse

A plan developed by Haaskens and Timmer in 1991 to convert agricultural land into an afforested area of lakes which stretches across the border into Germany, was not accepted in Germany and was considered financially unfeasible by the province of Groningen. Six years later, in 1997, the municipal councils of the municipalities of Scheemda, Winschoten and Reiderland and the council of the province, agreed with a derived and less ambitious plan. The public hearing in 1993 for the development plan as mentioned before (for which the concept of *De Blauwe Stad* was the central pillar) showed that there was broad support for a plan to revitalise the area. Therefore, in 1994, a foundation was erected for the development

of *De Blauwe Stad*, which was supposed to come up with a feasible, executable and appealing plan. In the final report of the foundation, water was presented as 'an ally in the battle against socio-economic deterioration' (Kok, 2004: 35). It was presented as a plan that counteracted the autonomous developments in the region. The plan included the promise that people in the region could 'take their future in their own hands'. In that respect, *De Blauwe Stad* is also 'a symbol for fighting against deterioration, exclusion and apathy'. As a consequence of this presentation of the plan, it received broad support in a region where socialist parties had a strong grass root community. For the purpose of receiving wide (national) attention, the marketing of the project was based on the uniqueness of converting land into water. The plan was presented as the 'most spectacular spatial planning project since the land reclamation of the IJssel-lake polders (the province of Flevoland)'.

Opponents of the plan point at the 'reversed world' of turning arable land into a lake, which runs counter to the long tradition of land reclamation in Dutch water management. They marginalised the number of structural jobs resulting from the plan and did not expect much benefit from management and exploitation of the 'water mass, designated for sailors, swimmers and rare birds' (Westerman, 1999). Many public administrators remained sceptical to the end about the financial feasibility. But the *Blauwe Stad*-foundation concluded in her final report that the project was feasible, if a number of pre-conditions were met.

Especially local residents were sceptical about a plan that involved a high financial and economic risk. Farmer families in the study area had sometimes worked the land for several generations and had even cultivated the land by hand. Therefore, they were not eager to sacrifice this land to unproductive land use functions, such as nature and water. However, the provincial and national government were in favour of the plan. A local farmer who was in favour of the plan argued that it was not such a bad idea to concentrate all kinds of land use functions (other than agriculture) in one area, which otherwise would have costed a lot of space as well and would have caused a fragmentation of the landscape.

The director of the PPP advertised the project in a meeting of the PvdA-political party of the municipalities involved, by arguing that 'the 4000 new residents of the area will need bread and a bicycle and want to be members of the church and sports clubs' (Kok, 2004: 36). He argues that the project will create important social and economic spin-off for the whole area, which will contribute to revitalisation of the region. In order to make the surrounding area benefit from the project, the design of the project area deliberately does not include large economic and social facilities, which would make the project area (more) independent of the surrounding area. The president of the fraction of the Verenigde Communistisch Partij (the United Communist Party) of the municipal council of one of the municipalities involved retorted by saying that 'we don't want houses for millionaires, but cheap rent-houses for starters and seniors. We want money for public transport, parks, and healthcare'. According to him, the *Blauwe Stad*-project is the biggest political blunder in the history of the *Oldambt*-region.

With regard to the function of housing, the focus is on the more luxurious segment of the housing market. The reason for focusing on this segment is the fact that the project wants to be unique for the region and wants to avoid competition with existing housing projects in the area, which aim at lower segments of the housing market. The project aims to draw new

residents from a larger area around the project and wants to create an atmosphere of 'rural living'. In this form, the red function is more easily combined with other land use functions in the area, such as nature and water storage. The residential areas of the project are recommended as 'one of the most beautiful residential areas in The Netherlands' and by asking the rethorical question 'where in The Netherlands can one still find houses at the shores of a big lake, amidst beautiful nature, often with your own landing?'¹⁵³. According to the director of the PPP-consortium, 'quality of the living environment' was the decisive factor in determining the maximum number of houses to be built in the project area. The minimum number is based on the estimation of the break-even point.

Water

With regard to water, the discourse of 'room for water' is dominant in the approach to water management in the area. The tryptich 'retention, storage, discharge' is the main leading principle for determining the types of measures to be taken. The lake in the project area is to store water in wet periods and is to function as a buffer for surrounding areas in dry periods ('water as a service'). In some valuable nature areas (moors), the water level will be raised to prevent the mineralisation of peet and thus protect the nature area.

According to the director of the PPP-consortium, since part of the public facilities is financed by the profit margin on private land use functions, private parties in the consortium regard the construction of the water system as a cost-increasing aspect of the project reducing this profit margin. Private parties will therefore be inclined to limit the package of public facilities as much as possible. On the other hand, the construction of the lake is expected to contribute to the amenity value of the living environment, which is expected to enable private partners to sell the plots against a higher price than comparable plots in the region that do not have a lake nearby. According to the director of the PPP-consortium, the presence of water contributes to the 'atmosphere of living' (*woonsfeer*) in the project area. Besides, the uniqueness of the aspect water (reversing the tradition by 'turning land into water') contributes to the name and fame of the project. However, as was indicated before, the director of the PPP-consortium holds the opinion that the real impact of the water system on the price of land and real estate cannot be determined. In other words, it is not used as a stand alone 'selling argument' for the selling of plots for houses. Therefore, the value of the water system for the total project will only be expressed in value added to other (public and private) land use functions indirectly. As a consequence, it does not play an explicit role in decision-making processes regarding those other land use functions.

Strategic discourse

The strategic discourse regarding the use of the hedonic pricing method for the financing of public facilities has already been described to some extent before. While advocates of the method point at the objectivity of econometric analysis to single out the effect of one price-component, critics focus on the emotional (and therefore intangible) nature of the housing market (especially on the demand side). At present, this latter discourse is dominant. As a consequence, parties involved in the arrangement do not seriously consider the option to use the hedonic pricing method to finance public facilities directly. In the context of this study, no hedonic pricing valuation of water was performed. Therefore, it cannot be said whether or not representatives of public interests would 'get a better deal' by using this method for the

¹⁵³ Source: website of the project (www.deblauwestad.nl)

financing of public facilities. According to the director of the PPP-consortium, for both suppliers and buyers of land and real estates, a large number of factors play a role in the determination of the price. As a consequence, he claims, this price is based on estimations and a feeling for the market, rather than on calculations. As a consequence, contracts between various parties involved (public suppliers, private suppliers and buyers) are inherently incomplete. The 'hard' calculation of one price component via valuation methods such as hedonic pricing does not seem to fit in such a situation.

The director of the PPP-consortium continues to state that the housing market for the project is a suppliers market. The demand for houses is not as high as in more densely populated regions of the country. As a consequence, the suppliers of plots for houses have to create a demand, by making the project area attractive and unique. The 'design' of the project area plays an important role in this respect. The marketing campaign (and the design of the residential areas) focuses on well to do people that want to live in a rural area where 'space and quietness' can be found. The natural setting of the residential area, such as the lake and nature zones, are expected to make an important contribution to this image. However, according to the project director, the location and position of the project with regard to other factors, such as job opportunities, the presence of a large town or city and accessibility, are much more decisive factors for the price of the building plots than the presence of water. The consortium does not advertise with 'living at the water front', but water is (definitely) part of the 'living atmosphere'. The market mechanism for the selling of plots of land is not so much related to water, but more to the scarcity of land. According to the director of the consortium, plots of land of the size as projected in the Blauwe Stad-project are scarce in The Netherlands. The scarcity of such large plots is seen as an opportunity to raise their price. At the same time, the abundance of space in Groningen as compared to the scarcity of space in other parts of the country makes it possible to keep the price of these large plots relatively low.

Power and resources

Public parties

As was mentioned before, the public parties involved in the project (state, province and municipalities) invest 35 million in the project. Besides this investment in the project itself, the province and the three municipalities in the PPP invest about 125 million Euros in the villages surrounding the project area. These investments are assigned to establishing connections with the new residential areas and for all kinds of economic initiatives. Part of these investments in the social, economic and physical infrastructure of the surrounding area is financed by subsidies or co-financing from the EU and the national government. Subsidies are only supplied if the project meets a number of preconditions. This counts especially for the EU-subsidies. These preconditions relate to meeting specified goals within certain time frames and financial boundaries. The specified goals may vary according to the supplier of the subsidy and may relate to social, economic or nature related policy.

According to the district manager of the water board, the possibility of storage of external water in the water system of the project area was a precondition for taking the task of maintaining the water system. In this situation, the water board used its authority and expertise with regard to water management to realise (part of) its policy goals within the project area. However, as was mentioned, the extra costs of the construction and

maintenance of the water system due to the function of occasional storage of external water will be borne by the water board and is financed from general means, since this function serves a larger area subject to the threat of floods or water nuisance from the secondary water system.

With regard to liability for water damage, clear agreements have been made between the water board and the PPP-consortium. The water board has indicated her ambition with regard to the water system, with regard to the standards (both in a quantitative and qualitative sense) to be met to achieve these ambitions and with regard to the (possible) consequences for the project area and its surroundings. These ambitions (at least the minimum standards) can be enforced by applying their public authority via the regular instruments designed for this purpose. An important aspect with regard to the functions, design and consequences of the water system is the definition of normal and extraordinary situations. In short, the water board is not liable for the effects of the water system or water management activities on other land use functions in the project area that fall within the boundaries of the normal situation. This means that other land use functions have to be adapted to the normal conditions, or parties other than the water board will be responsible for the consequences. This responsibility will have to be communicated very clearly between various parties involved (especially in real estate, being the PPP-consortium and future house owners). Any situations that fall outside the scope of the normal situation will be the liability of the water board. According to the district manager of the water board, the water defense infrastructure has been designed for the possibility of water inlet with the frequency of once every 30 years, with the possibility that some water nuisance will occur in the residential area. Considering the fact that inlet from outside the project area is an 'extra' water management activity, which falls outside the boundaries of the normal situation, any damage due to this activity will primarily be the liability of the water board.

Private parties

The main resources of the private parties in the PPP-consortium are their expertise in infrastructural projects and construction. Besides, they can act as pre-investors and are willing to bear all the financial risks involved in the project. Bearing financial risks can be regarded as a financial resource for the project.

Micro-level analysis

Political criteria

Equity

Inhabitants of the surrounding area were afraid that all subsidies and investments would be directed at the Blauwe Stad-project, leaving less financial resources for surrounding areas. Therefore, as was mentioned in the paragraph about 'discourse', it was agreed among the public primary actors to also invest in the surrounding area, referred to as 'the ring'. Politicians and public civil servants have co-operated since 2003 in a joint project organisation in the project 'Ring Blauwe Stad'. It is the intention of the project organisation to involve inhabitants, entrepreneurs and interest organisations in the concrete projects within the larger project of 'Ring Blauwe Stad'. Besides investments by public organisations, the project is also expected to generate an economic spin-off for the whole area, especially with regard to recreation and tourism. As was mentioned before, for this reason, no major economic and social facilities will be created in the project area itself.

Public support

According to the director of the PPP-consortium, a number of activities strongly contribute to getting public support for the project. These activities are 'fitting the project in its environment', 'tuning the project to the environment' (establishing links), and 'letting the environment of the project benefit from the project'. This is a major reason for starting a programme directed at improving the socio-economic infrastructure of the ring of villages and towns surrounding the project area. According to the director of the consortium, this considerate approach gradually took away scepticism, especially with those who saw (business) opportunities, such as local entrepreneurs.

The director of the PPP-consortium states that from the 'public perspective', the agreements made in the process of development and execution of the project can always be related to public support. If the public parties involved would not have been able to buy off their financial risk, or if the initial cost-benefit analysis would have been (more) negative, public acceptance would have been much harder to obtain.

Dependability/exactness

The discussion of the hedonic pricing-method in the paragraph about policy instruments in the arrangement showed that there is no consensus yet about the usefulness, dependability and applicability of this method. In other words, there is a strategic discourse about this method and its application. Sceptics (such as the primary actors in the *Blauwe Stad*-arrangement) found a way to circumvent the discussion about the hedonic pricing method (i.e. the value of public facilities). Based on policy goals and standards, they formulate which public facilities have to be realised at minimum. These minimum facilities in principle have to be paid for by the (profitable) private facilities. This reduces the profit-margin of private parties that benefit from the project. Any facilities going beyond this minimum should, in principle, be financed by public parties involved. Then, it is up to the public and private parties to calculate (somewhat separately) whether the outcome of their cost-benefit analysis is positive enough to go ahead with the project, taking account of the financial and economic risks involved. This approach, however, has its difficulties as well. In this approach, the standard public facilities and extra public facilities need to be defined very precisely. Besides, the decision whether or not to go ahead with the project, based on the outcome of the CBA and possibly a range of other factors, will still be based on expected costs and benefits. The calculation of expected costs and benefits also requires economic evaluation that might be accompanied by considerable uncertainties.

The preference for this indirect method can be explained from the fact that methods for the calculation of direct costs of constructing public facilities are more developed and institutionalised than methods for the calculation of (often indirect) benefits of public facilities to various parties. Since there is more agreement between the negotiating actors (the parties of the PPP-consortium) about these methods, using these methods as a basis for negotiations brings along lower transaction costs (such as costs made for research, information retrieval, negotiations, the reduction of uncertainty, etc.). The consequence of this approach is that the direct costs and benefits (i.e. the costs and benefits for the partners of the consortium) will be calculated fairly accurately, while the indirect costs and benefits will remain less clear. The fact that the indirect benefits of public facilities for a large part remain unclear may lead to underestimation of the value of these facilities. However, the awareness that the public facilities (such as nature and the water system) explicitly

contribute to the quality of the project area seems to warrant attention for these aspects. The benefits of the total project, including high quality public facilities, is expected to be reflected in the socio-economic figures of the region.

Risk and uncertainty

As showed from the discussion of the agreement on the distribution of costs and benefits between public and private parties, financial risks were an important factor for public parties in the choice of the type and content of the agreement (the contract). The reduction of financial risks seems to have priority over the exact determination of public costs and benefits, the minimisation of the former and maximisation of the latter. A reason for this preference is that many of the inhabitants of the region in which the project is performed have been very sceptical about the financial feasibility of the project from the start. Reducing financial risks for the public budget may in such a situation be more important than the exact calculation and reaping of the benefits of public facilities.

Summary

The role of economic methods and instruments

The added value of the presence of water for other functions of the project area is not made explicit in the negotiations about the agreement between public and private primary parties (parties involved in the PPP-consortium). Economic valuation methods that may directly express this value in monetary terms are not considered, let alone accepted as a method. Discussions about this method would probably complicate reaching an agreement rather than facilitate this process. Instead of explicitly including the added value of water in the negotiations, the presence of water contributes to the general quality of the living environment and as such may indirectly be reflected in higher prices for private land use functions, such as residential areas, which is a crucial interest for private parties in the consortium. Public parties 'skim' part of this added value of the quality of the living environment expressed in the prices of houses by raising high demands on the quality of public facilities, the realisation of which is partly financed by private parties.

Spatial planning has been standardised (and thus institutionalised) via the legal system and decision-making mechanisms in the representative democracy. The legal system acts as a back-up for the representative democracy. Issues such as compensation for damage or negative effects due to the spatial planning project are settled via this legal system. This standardisation has not taken place (yet) for the application of economic valuation methods. As a consequence, economic aspects of the project (mainly the distribution of costs and benefits) are more likely to be settled via this legal system than via the application of economic policy instruments and methods. One could say that in establishing the value of water, the valuation of negative aspects, such as damage to private property, has been developed more than positive aspects, such as the added value for various types of land use (living, recreation, tourism, etc.). One reason for this is that the value of the property damaged is established in a widely accepted market, while positive effects of water systems are usually more indirect in nature and therefore more difficult to calculate. As a consequence, 'markets' for these types of effects have not yet been institutionalised.

The mutual dependence of public and private parties may create a feeling of a joint task, a joint goal, joint efforts and joint responsibility. This can only be achieved if parties involved in

the PPP-consortium trust each other. Trust is therefore an important factor in this situation. Many aspects of incomplete contracts, such as liability, can be arranged by a clever design of the contract. However, if trust is not present, this contract is unlikely to be established. The economic valuation methods discussed in this paragraph are not likely to contribute to understanding and therefore trust between the parties involved in the negotiations.

COMPARISON OF VARIOUS PPP-ARRANGEMENTS FOR WATER STORAGE AND SUMMARY OF THE FINDINGS

In this part, the PPP-arrangement as described in this subsection and the arrangements analysed by Van Bommel et al. (2002) are compared with regard to various factors influencing their implementation, divided into macro-, meso- and micro-level factors or aspects.

Macro-level analysis

PPP-arrangements in water management fit the trend in governance towards deregulation. Deregulation (amongst other things) involves leaving more of the realisation and management of formerly public facilities to the market. A major motive for both public and private parties to stimulate deregulation is cost-effectiveness. Both with regard to the realisation of new spatial projects (creating new land use functions) and the performance of water management tasks (combining existing and new land use functions), the interests of public and private parties can often be combined in PPP-arrangements and water management tasks can be (partly) financed by private parties. Therefore, PPP-arrangements are regarded as a (potentially) cost-effective alternative approach in water management.

Various developments in society influence the demands of consumers regarding the function of rural areas. Besides traditional agriculture, (rural) living, nature, recreational facilities and water storage have become important functions. The dominant normative discourse with regard to these varying demands for space in rural areas is the combination of land use functions in one location. PPP-arrangements typically combine various land use functions and thus fit in this normative discourse.

Meso-level analysis

Informal institutions

Policy paradigms

The PPP-approach to water management shows characteristics of various policy paradigms. With regard to the normative discourse, structural measures are advocated that increase supply or limit use of natural resources. This approach fits the resource management paradigm. At the same time, PPP-arrangements are meant to lead to win-win situations (positive sum game) for society and nature, which reflects the eco-development paradigm. In the strategic discourse, the dominant thought is 'internalising externalities', which is a central characteristic of the environmental protection and resource management paradigms.

Theoretical preconditions for PPP-arrangements

Whether there is general consensus in the scientific world about the theoretical preconditions for PPP-arrangements, as formulated by Van Bommel et al. (2003), fell beyond the scope of this thesis. Because of these theoretical pre-conditions, PPP-arrangements fit in a style of governance that is based on consensus building and negotiations between public and private stakeholders, taking equal positions of power as a starting point. According to an employee at the ministry of LNV, there is a general trend in governance from a more centralistic (top-down) approach towards this bottom-up style of policymaking and implementation.

Problem ownership

Actors involved in PPP-arrangements for water management activities take the existing institutional framework as a starting point to determine property rights, and base their judgement about problem ownership on those rights. This in turn influences the types of services that need to be paid for and the amount of payment or compensation. These existing property rights make it more difficult to achieve cost-effective approaches to water management in situations in which existing land use functions are maintained than in situations in which new land use functions are created. In the latter situation, new standards can be introduced, which change the property rights of future owners and users.

Formal institutions

Policy principles

A number of policy principles relate or apply to PPP-arrangements. To start with, PPP-arrangements fit the subsidiarity principle, which is a formal policy principle at both EU and national level. Water quantity management measures are location bound and location specific and therefore, PPP-arrangements for water quantity management are typically local in nature. As such, these arrangements fit the subsidiarity principle of local and tailor-made policy approaches. At the same time, the subsidiarity-principle is often used to legitimise a reduction in the provision of facilities to society via the public structure (in other words: cut public expenses). If interpreted as such, it equals the trend in governance towards deregulation. By giving the principle different meanings, it can serve various purposes. This, off course, is a key characteristic of discourse.

With regard to regional and local spatial water management, 'water as a planning principle' was introduced at the national level some years ago. At first, this principle was not institutionalised, which made it a powerless principle. With the institutionalisation of the principle in laws, regulations and instruments (such as the *watertoets* (water test)), the position of water in spatial planning has changed. New land use functions are not so easily realised anymore without incorporating the consequences of the initiative for water systems. This has also resulted in the possibility of applying the cost-recovery principle for water management in the realisation of spatial development plans (see below).

PPP-arrangements combine a number of financing principles at the same time, namely the benefit principle, the cost-recovery principle and the principle of cost-effectiveness. In spatial planning projects introducing new land use functions, private parties indirectly benefit from the quality of the living environment, which is reflected in the price of plots and houses. Nowadays, these private parties are made to (partly) finance the public facilities in the living

environment. Thus, profitable (private) land use functions (co-)finance non-profitable (public) functions and as a consequence, water products or services are provided to society in a cost-effective way. In other words, private actors are forced to include the general interest into their (financial) decision-making process. In arrangements involving water management tasks besides existing (profitable) land use functions, the costs for performing the water management tasks are, in principle, borne by those that benefit from the arrangement. This can be a wide range of actors, ranging from a private party commercially exploiting the area to residents of areas that, through the arrangement, incur lower flood risks. This mechanism is expected to be more cost-effective than the purchase of land by water managers to realise their goals.

Policy agreements

The use of PPP-constructions is stimulated by policy goals laid down in the *Nationaal bestuursakkoord water* (National agreement on water governance). This agreement, which is a covenant between national, provincial, municipal and water board authorities, laid down various water quantity management goals (such as water storage capacity targets), including in spatial planning. This agreement contributed to the institutionalisation of the normative discourse about spatial solutions for water quantity management (*water accommoderen*, accommodating water). In a relatively short period of time, this discourse has taken over dominance from the discourse regarding water quantity management taking artificial defense structures as a starting point (*water keren*, stemming water).

Policy instruments for PPP-arrangements

Van Bommel et al. (2003) identified a number of policy instruments that can be applied in PPP-arrangements ('area development contract', 'water storage fund', 'commercial exploitation', 'management agreement' and 'use right' or 'one time compensation'). The area development contract, water storage fund and commercial exploitation are instruments for situations in which there is a clear (commercial) interest for private parties in the realisation of new land use functions. This is not necessarily the case for the situations in which the other instruments (management agreement, the use right or the one time compensation) can be used. These instruments are suitable for situations in which water management activities are introduced in areas in which the existing land use function is maintained, and which may even conflict with the water management activity. Compensation for a water management service in these situations can be organised in various ways, such as a structural payment in a management agreement, payment for a use right or a one time compensation, depending on the service required.

According to the authors, the area development contract complies with the starting conditions for PPP-projects. The challenge with regard to this instrument is to realise more than two functions, in which both public and private parties have an interest. This can lead to creative solutions in which PPPs can play a role. The PPP-arrangement for the Blauwe Stad-project is typically an 'area development contract'. The disadvantage of a water storage fund is that it generates money, but not expertise or other specific resources. Therefore, the authors regard this instrument more as just 'the creation of a fund' than as a PPP-arrangement (with a common goal, win-win situations and mutual dependence). The commercial exploitation and management agreement relate to the phase after realisation of the project. The first assumes profitable management, in which the water storage is included as a function. The second is based on a compensation for the management of water storage.

An assumption with regard to this construction is that this type of management is cheaper than the situation in which the water board would manage the area itself. The instrument 'management agreement' can be regarded as a blue service.

Legal framework

At the national level, the legal framework for PPP-arrangements is mainly shaped by spatial planning and water management laws, specifying the content of and procedures for spatial plans and water management plans. An important legal instrument is the *watertoets*. This instrument has been anchored in the Spatial Planning Act (*Wet op de ruimtelijke ordening*) and in the Decision on spatial planning (*Besluit op de ruimtelijke ordening*). Besides national laws and regulations, some EU-laws may influence the application of PPP-arrangements. Especially laws and regulations regarding government support and public tendering may have (negative) consequences for the applicability of PPP-arrangements in water management. The way these EU laws and regulations influence the applicability of PPP-arrangements will depend on the type of instrument applied. In the case of project development including profitable land use functions, there is no situation of government support. In the case of agreements regarding water management measures combined with existing land use functions (more resembling blue services), this may be interpreted as government support.

Guidelines and standardisation

Since PPP-arrangements are rather new in (spatial) water management, these arrangements have not been standardised yet. The expectation is that standardisation will reduce transaction costs and will help 'institutionalise' (stabilise) this policy arrangement. In a first attempt to standardise arrangements, Van Bommel et al. (2003) constructed a number of ideal-type arrangements for PPP. Standardisation is only likely to happen if the arrangement is applied on a large scale. Government co-operation (for example in terms of creating the right conditions) may be needed to achieve this.

Economic rules

PPP-arrangements will always result in some free rider behaviour, since property, disposition and use rights of land and water can never be completely privatised. The fact that PPP-arrangements are constructed for (co-)financing public tasks automatically means that free rider effects will occur. However, these free rider effects are expected to be mainly positive in nature, consisting of benefits to society as a whole. The aspect of property rights should be paid close attention to when negotiating about the degree to which private partners are to finance public tasks and facilities. The co-financing of public tasks and facilities by private parties may gradually lead to privatisation of these public tasks and facilities. Whether this is a desirable development depends on the dominant normative discourse regarding water systems management (regarding water as a condition, a service or a product) and other land use functions. In the debate about balancing public and private interests, it is important to distinguish between ownership, disposition and use rights.

Discourses

At the national level, the dominant normative discourse is that water needs to be retained and stored and that space needs to be reserved for this purpose. In recent years, this discourse has been anchored in formal institutions (*watertoets*, see chapter 4). At the regional and local level, however, a struggle is still taking place for discursive hegemony. At this moment, the traditional discourse of 'water as a condition' (mainly for agriculture) is still

dominant in most areas, but the discourses 'water as a service' and 'water as a product' (which take a central place in PPP-arrangements) are gaining ground. The latter two discourses will intensify the debate about property rights, while in the traditional discourse, property rights were not really an issue. The debate at the regional and local level addresses the issue of which land use functions rural areas should provide, how this is decided and coordinated and who should pay for it. This debate may have far going consequences for the approach to water management in rural areas, and thus for the position of various actors involved. At present, new arrangements and instruments are often adapted to the existing distribution of property rights. This means that new land use functions can only be realised if negative consequences for existing land use functions are compensated for. Projects for which the zoning plan is changed and new land use functions are appointed offer opportunities to change the property rights of the area based on the normative discourses of 'water as a service' or even 'water as a product'. As such, they enable a more structural shift towards new discourses and approaches in water management.

In the analysis of the PPP-arrangement for the *Blauwe Stad*-project, more attention was paid to the specific discourses regarding the project than in the analysis of PPP-arrangements by Van Bommel et al. (2003). Paying attention to the discourse regarding a specific project creates a better insight into the motives of actors to support or oppose to an arrangement or instrument. This creates the opportunity to make more specific observations and (possibly) give more tailor made advice regarding the arrangement.

Actors, motives and interests

Van Bommel et al. (2003) distinguish the following categories of actors: public and private actors, supplying and demanding actors, initiators and inhibitors, dwellers and nomads. These categories, which were added to earlier identified categories, such as primary vs. secondary actors (see chapter 3), helped understand the motives and interests of the various actors involved in PPP-arrangements. For example, dwellers are actors that are fixed to one location, and therefore have a continued interest in the consequences of a PPP-arrangement. Nomads, on the other hand, are not bound to the location in any way, and therefore have a short term (emotionally detached and usually business related) interest in the area. The balance between the types of actors within each category is different for each situation. Therefore, no general statements will be made. However, some comments related to specific arrangements can be made here.

In the *Blauwe Stad*-project, water storage was not a primary goal. For the other examples studied, it was. Therefore, contrary to other cases, in the *Blauwe Stad*-project the water board is not a primary actor (initiator of the PPP-arrangement). Rather, the water board acts as an advisory actor. The water board involved only has a specific interest in the project in terms of water storage. Since it does not have an interest in the realisation of the other functions, it did not have an interest to be part of the new legal entity. Because in the project area, new land use functions were being created, the water board did not need to engage in a PPP-arrangement to achieve its spatial water goals. Besides, the contract does not involve any transfers of financial resources from public to private actors for services offered (other than the construction of the extra facilities to accommodate or compensate for extra water storage). In the arrangements studied by Van Bommel et al. (2003), spatial water management measures were a primary goal. In these arrangements, the water board was

often the initiator of the arrangement. The direct involvement in the arrangement as initiator means that the water board has a more direct influence on the terms of the agreement (contract). It also means that the water board transfers financial means to private actors for a service offered.

In case of area development contracts, the private primary actors involved in PPP-arrangements for water storage are often project developers. These actors are nomads, and therefore have a short term, business related interest in PPP-arrangements. Motives for involvement usually are, but do not necessarily need to be exclusively financial. Based on the examples studied, primary motives for these actors (in the project itself) may be return on investment, changes in the institutional framework, such as the development plan (which result in business opportunities) and long-term relationships with public actors. A derived motive for project developers (in water) may be the visual effects of water for residential areas and business parks. Other private actors (either primary or secondary) may be entrepreneurs, which aim to commercially benefit from the arrangement. These entrepreneurs, in general, have longer lasting interests in the location, and therefore take an intermediate position between nomads and dwellers. Derived motives for project developers and entrepreneurs may be the excavation of sand, the commercial exploitation of recreational water bodies, biomass for energy production (energy companies), insurance schemes for compensation of damage due to water storage (insurance companies) and purification of water (drinking water companies). According to Van Bommel et al. (2003), learning effects may also be an important motive for private actors with mainly a commercial interest in the arrangement. According to the director of the PPP-consortium for the Blauwe Stad-project, however, this motive did not really play a role for the involvement of private parties in that particular PPP-arrangement. It must also be noted that the interests of various private actors may mutually conflict. Nomads, in general, regard water as a product, whereas dwellers are more likely to regard water as a service or as a condition. Often, also groups of private actors exist that have a non-commercial interest in projects or management arrangements. These actors usually consist of citizens or employees, which like to live, work and recreate in a water-rich environment. These private actors are usually not primary actors in the sense that they are a party in the PPP-arrangement. As a consequence, they have limited direct influence on the terms of the PPP-agreement. They may exert their influence via the regular mechanisms of representative democracy or in other, less formalised ways.

Initiators of PPP-arrangements are usually public authorities such as municipalities, provinces and water boards. However, private parties may be initiator as well, for example project developers, investors, sand excavators, etc. Examples of dwelling actors are water boards, municipalities, provinces (public actors), recreational undertakers, nature managers, farmers, other landowners and -managers (private actors). Terrain managers and nature organisations may act as initiator or supporter of a PPP-arrangement if new nature is involved. In case of using existing nature for water management measures, the position of these actors may vary (see blue services). Farmers may be inhibitors in case they regard water storage as an undiscoverable land use function. Besides, they usually do not intend to compromise on or give up their enterprise. On the other hand, farmers may see a PPP-arrangement as a business-opportunity to diversify their agricultural enterprise. This attitude towards PPP-arrangements for a large part is determined by their paradigmatic view on the

property rights of natural resources, such as land and water. Agricultural representative organisations often have a positive attitude towards PPP-arrangements in water management, since they consider these approaches as a business opportunity for their members. Interests of nature managers and farmers may either converge or conflict, depending on the type of water measures envisioned. In case of structural measures to increase water storage capacity (such as water level fluctuation) or water reserves, or to mitigate subsidence, salinisation or desiccation, nature managers in general will be in favour of the measure, while farmers are likely to object. In case of temporary water services, such as water storage, both farmers and nature organisations may object from the perspective of deteriorating quality of the land or the ecosystem. This counts for water storage on existing agricultural land or in existing nature areas. The discussion above shows that the types of advocates and the composition of advocacy coalitions on the one hand and of opponents and opposing coalitions on the other depend on the water management activity envisioned and the (net) effects of this activity on nature or arable land.

Power and resources

The main resources to be brought in by private parties in a PPP are financial resources and land. Financial resources originating from commercially feasible functions (often 'red') are required for financing water storage (and other non-commercially feasible (public) functions). In the financing structure and purpose, like with other aspects of PPP-arrangements, a distinction should be made between financing the construction of a project and the financing of management and maintenance. These activities often require the involvement of different types of private partners. In the first type of activity, often nomads, such as project developers and banks, are involved, while in the second, 'dwelling' entrepreneurs are more likely partners. In the *Blauwe Stad*-project, the emphasis with regard to financial resources was on financing the development of the plan. Since water storage was not a primary goal of the project and could not be regarded as a standard element of the design of the water system in the area, water management and water systems maintenance costs are carried by the water board. These costs will be financed (mainly) through water systems levies charged to inhabitants of the management district of the water board.

One of the theoretical pre-conditions of PPP-arrangements is that every partner supplies specific resources that other parties don't have. In case a PPP-arrangement is envisioned for structural water management activities, farmers and (other) terrain managers can provide two important resources: manpower for management tasks and land. Especially property rights of land give landowners a powerful resource in negotiations. A resource private partners can bring in in arrangements for area development is expertise about project development. Public authorities often do not have the resources (including expertise) to execute a project themselves. This especially counts for project development, and less so for management and maintenance activities. Another (very) important 'resource' of investors is the willingness to take financial risks.

The media can be an important resource for power for both advocates and opponents of a PPP-arrangement (or the activity the arrangement was erected for). The media can strongly influence public opinion (societal discourse). Therefore, a good communication strategy by the project partners is often an important point of attention. This aspect was stressed by

various sources with regard to the *Blauwe Stad*-project. Initially, the majority of the inhabitants of the region was against the project and the media focused on the financial infeasibility of the plan. With the introduction of private land use functions, the financial feasibility improved, and since then, media attention became more positive, stressing the uniqueness of the plan. According to the director of the PPP for the *Blauwe Stad*, an important application of various resources is the 'investment' in creating trust among PPP-parties, and between PPP and other actors.

Micro-level analysis

Technical criteria

Efficiency

Efficiency is an important motive for PPP-arrangements, and therefore an important criterion for the selection of such an arrangement. The application of PPP-arrangements in water management is expected to lead to (highly) efficient use of scarce land because of function combinations. Besides, in some situations (i.e. development projects involving new land use functions), it is expected to lead to efficient use of public financial resources with regard to the provision of public facilities, because of the co-financing by private parties. A major advantage of combining other land use functions with spatial water management measures is the fact that the space required (land) does not have to be appropriated by the water manager (no transfer of property rights), but instead the service can be hired (partial transfer of disposition and use rights).

Transparency

Transparency is a crucial factor in PPP-arrangements. This holds for both the relationships between partners within the PPP-construction and the relationships between the partners in the PPP-construction and other actors. Transparency can relate to a large number of aspects of the arrangement. It may relate to the motives and intentions of the primary actors in general, and the consequences of their actions and the terms of the contract in particular. The terms of the contract may relate to the co-ordination of tasks, the financing of activities, responsibilities, decision-making authority, the allocation of risks among the partners, the settlement of conflicts (accountability), etc. A carefully constructed, clear and well communicated contract is crucial for trust among the partners and among other actors. Besides, a transparent communication with secondary actors (such as the general public) can be an important factor in the acceptance of a project. This was clearly demonstrated in the analysis of the *Blauwe Stad*-arrangement.

Fairness

A general fear among citizens and other secondary stakeholders with regard to PPP-arrangements for project development is that the private partners (especially the nomads) will reap the economic gains of the project, while the financial risks and the costs will have to be borne by the general public. Whether this is true to a large extent depends on the specific terms of the contract, especially with regard to the degree private partners are made to contribute to the financing of public tasks and the way public partners are able to cover financial risks. In the *Blauwe Stad*-project, initial scepticism was largely taken away by clear communication about the terms of a carefully constructed contract. An important element was that public parties succeeded in buying off all financial risks involved in the development of the project area. Besides, the design of facilities was done in such a way that the project

area socially and economically depends on its surroundings. This is to guarantee an economic and social spin-off to these surroundings, which enhances the fairness of the project.

Political criteria

Usefulness and necessity

Usefulness and necessity are important criteria for the support for PPP-arrangements by private parties (especially landowners). This is the case for water management measures and not so much for the execution of development plans. In the latter, the advantages for private parties are more obvious than in the former¹⁵⁴. Therefore, in the former situation, intensive communication may be needed to inform potential private partners in this respect. Convincing potential private partners of the usefulness, necessity and opportunities and benefits of PPP-arrangements is even more important since PPP-arrangements are based on voluntariness. This characteristic makes discourse an important resource in these types of water management approaches.

Integrativeness/sustainability

The integrativeness of PPP-arrangements is expected to be high, since in general, several (spatial) issues are addressed in one arrangement. Besides, in spatial approaches to water management, water is taken as a leading principle in spatial planning. This is regarded as an inherently sustainable principle. Water management based on this principle is expected to be more robust, less costly, less vulnerable and in general having more positive effects than the traditional technocratic approaches to water quantity management. In other words, it prevents rather than mitigates or cures negative effects. Besides, these arrangements pay attention to several aspects of sustainability at the same time (economic, social, ecological), whereas centralistic market-based instruments mainly pay attention to the ecological aspect (and the economic aspect from a financing point of view, and not from the point of view of economic sustainability of economic sectors).

Summary of PPP-arrangements

Positive effects/opportunities

For the description of the effects of PPP-arrangements, a distinction needs to be made between PPP-arrangements for development of projects and arrangements for water management measures. The positive effects of PPP-arrangements for the development of projects is that public authorities will sooner be able to realise their policy goals through private (co-)financing. The compromise is that these initiatives need to provide some kind of incentive for private partners to invest in the project, and therefore that perhaps the project cannot be exactly shaped the way public parties envisioned. Positive effects of PPP-arrangements for water management measures are expected to lie in cost-effective use of public resources for water management, combined with opportunities for farmers or other private partners to strengthen their business position. Besides, structural payment to private partners for PPP-services may give the agricultural entrepreneur the financial basis to switch to more sustainable agriculture.

¹⁵⁴ The private parties involved in these arrangements differ (dwellers versus nomads, respectively), both in the duration and the nature of the interest.

Negative effects/threats

A number of negative effects may be perceived by landowners. One of those effects is that with PPP-arrangements for water management, traditional (i.e. 'modern') agricultural practices may no longer be feasible. Besides, the flooding of land may deteriorate the quality of land and/or ecosystems. Some secondary actors (mainly citizens) may not want characteristic traditional land use patterns to disappear and would thus like to preserve cultural-historical landscapes. Others, however, may prefer extensified agriculture over bio-industry and intensive agriculture. The attitude of landowners and the public opinion will depend on paradigmatic positions towards the man-nature relationship and the balancing of interests in the arrangement.

Success factors

Based on the analysis of various arrangements, Van Bommel et al. (2003) give some recommendations for PPP-arrangements with regard to water storage. The main ones are that public actors involved in the initiative should take care of a clear communication of the advantage of the arrangement for private parties. Besides, a crucial factor for the success of the arrangement for the longer term is the design of a clear agreement and contract. Clear and transparent contracts and communication are essential for co-operation and trust. An important aspect of this factor is agreements between the partners in the PPP-arrangement on how to deal with the (inherent) incompleteness and associated uncertainties of the contract. Besides, a paradigm shift would be required among all stakeholders in rural water management from regarding 'water as a condition' to 'water as a service' or 'water as a product'. PPP-arrangements stand a better chance of success in case new functions are assigned to a potential water storage area than in case of water storage on land with existing functions. The latter type of water management measures is probably better suited for blue services.

Potential obstructing factors

According to Van Bommel et al. (2003), paradoxically, leaving spatial planning more to the market (which is the tenor of the most recently published white paper for spatial planning, the Nota ruimte) reduces possibilities for PPP, since private parties do no longer need public parties for realising their plans. Besides, means for public parties to enforce public measures upon private parties will be reduced. According to Van Bommel et al. (2003), releasing the restrictive national policy for the protection of rural areas offers opportunities to by-pass public authorities. In that case, the added value of new functions cannot be used to realise (non-profitable) functions that serve the public interest (water storage). This result of the study runs counter to the general hypothesis that a loosening of the grip of public organisations on spatial planning will lead to more public-private initiatives.

EU-regulations regarding tendering and government support may cause problems for PPP-arrangements as well. As long as no clarity exists about the position of the EU regarding PPP-arrangements in water management, the risks of getting involved in PPP-arrangements are probably regarded as too high by private parties. This is especially likely to be the case for management agreements involving existing land use functions. For spatial planning projects involving mainly new land use functions, this is less of a concern, since these arrangements often include profitable land use functions for private parties, for which no or less state support is required.

Evaluation of the method

The four dimensions which the policy arrangement theory uses to disintegrate policy issues, yield valuable insights into the feasibility of PPP-arrangements for water storage. Together with macro- and micro-level analysis, it enables making a comprehensive inventory of all factors influencing the decision-making process about PPP-constructions for water storage. An important aspect of the analytical framework of this thesis is that both stimulating and inhibiting factors can be identified. With regard to the dimensions of the policy arrangements studied (resources, actors, rules and discourse), the focus of the report by Van Bommel et al. (2003) was strongly on those types of dimensions that contributed to the establishment of PPP-constructions and not on those that might inhibit them. For example, with regard to actors, mainly advocate coalitions were mapped, and not much attention was given to possibly adversary coalitions. In the analysis of the PPP-arrangement for the Blauwe Stad-project, both advocates and opponents were analysed. Besides, not only the position of primary actors in the policy arrangements was analysed, but also that of secondary actors. Because of this broader analysis, a better insight in the motives of actors for their actions could be obtained and a more comprehensive picture could be drawn of the factors influencing the decision-making process.

5.5 ECONOMIC EVALUATION OF PUBLIC PROJECTS IN THE 'ROOM FOR RIVERS' POLICY

5.5.1. INTRODUCTION

In the previous section, two types of policy arrangements were discussed that enable the operationalisation of the 'room for water' policy at the local and regional scale¹⁵⁵. In this section, (possible) arrangements are discussed that (aim to) operationalise the 'room for water' policy for the major rivers in The Netherlands (the primary water system) and thus for the national scale. Regarding this aspect of water (quantity) management, the policy is referred to as 'room for rivers'. The responsible water management authority in this respect is the national government, more specifically the Ministry of Transport, Public Works and Water Management. The economic instrument discussed are methods for economic evaluation of public water management initiatives. In this section, two opposite alternatives for flood protection are compared that are based on the *water keren* (defending against water) and the *water accomoderen* (accomodating water) discourses. Since the alternative based on the latter discourse, as studied in this thesis, was a hypothetical approach, no full-grown policy arrangement was in place, and therefore, some elements of the analytical framework could not or hardly be analysed. The emphasis in this section is on the discourse, and the role methods for economic evaluation of alternative approaches (may) play in this discourse. As a consequence of the above, the order in which various elements of the

¹⁵⁵ The water management measures themselves usually have a local scale (for example expressed in hectares of land involved), the effects of these measures may be felt in a direct sense on a local or regional scale (such as reduction of flood risks in the whole subbasin of minor rivers). Indirectly, they may even contribute to a reduction of flood risks (or other policy goals) on a national or international level.

analytical framework are presented diverges somewhat from that of the analytical framework.

Subsection 5.5.2. introduces the policy issue of protection from river flooding and developments in this policy issue. In subsection 5.5.3, the *Rivierenland*-study is introduced. This study is an initiative by the Ministry of Transport, Public Works and Water Management to analyse the feasibility of alternative approaches to flood protection. Subsection 5.5.4. discusses exogenous factors that influence policy regarding river flooding. Subsection 5.5.5 addresses the elements of policy arrangements regarding this policy issue. Subsection 5.5.6 discusses factors at micro-level and in subsection 5.5.7 a summary is given of the factors at all three level that influence the role and content of the economic evaluation method in addressing the policy issue.

5.5.2 CHARACTERISATION OF THE POLICY ISSUE OF RIVER FLOODING

The policy issue (or 'theme') described in this section is that of 'dealing with flood risks resulting from high discharges in the major rivers'. Four rivers are indicated as major rivers in the Netherlands: the Rhine, the Meuse, the Scheldt and the Ems. The most important criterion that distinguishes these major rivers from other rivers in The Netherlands is the fact that the major part of their catchment area lies in other countries. The rivers Rhine and Meuse are considered the most crucial ones with respect to river flooding. In the course of centuries, the major rivers of The Netherlands have increasingly been modified in order to be able to control the water, amongst others for distribution of fresh water to various areas in The Netherlands, for transport, and for flood protection. The rate of modification has not always been the same. Until the end of the 19th century, flood protection from major rivers was regulated by smaller and larger water boards at the level of each individual management district (often a single polder). In the 19th century, training programs were initiated at the national government level to train water management engineers. The role of these engineers in quantitative water management of the primary water system gradually increased up to the point (in the beginning of the 20th century) where the national government had completely taken over the responsibility for management of the primary water system. In this phase of water management, the diverse sectoral functions of water for human use became a central issue. Transport over water and large scale land reclamation increased in importance, just as the use of water for (industrial) production, agricultural purposes (irrigation) and consumption (drinking water). In each sector, policy, legislation and regulation emerged separately. This phase started with the industrial revolution at the end of the 19th century and ended roughly halfway the '80s of the 20th century. An interesting description of this development is provided by Schot et al. (1998).

The translation of the 'water systems approach' into the concept of integrated water management in the policy paper 'Omgaan met water' (Dealing with water) (Ministry van Verkeer en Waterstaat, 1985) started what Schot et al. (1998) call the fourth phase of water management. This new approach has also been reflected in policy concepts for the functions and management of the major rivers. For example, in the late 1980s and early 1990s, a number of reports were produced that aimed to establish new combinations of land use functions in the flood plain of the major rivers. One such a combination was that of water

discharge and nature. The idea was that the major rivers were natural corridors for species migration, which was a central element of the concept of the *Ecologische HoofdStructuur (EHS)* (main ecological structure), which was introduced by the ministry of Agriculture, Nature management and Fisheries (*LNV*).

New functions for the rivers, especially nature, and the water systems approach require a different spatial planning of the river bed. For the river to act as a natural corridor, room needs to be created for zones in the river (winter)bed in which nature can develop. Besides, barriers need to be removed that can hinder migration in this corridor (both in the water and on land), such as dams, roads, factories, etc. The water systems approach takes as a starting point that activities in the whole river basin can influence water management and other functions in other parts of the river basin. For example, upstream measures to retain or store water are expected to have effects on evening out the peak discharge through the river. Aquatic (and terrestrial) ecosystems are regarded as natural sponges that retain water. For this approach to water quantity management in the river basin to be effective, (a lot of) space is required to allow these ecosystems to develop. In short, the 'room for rivers' approach to river basin management is based on a completely different view on the functions of, and thus on the spatial planning in, river systems, and especially in river beds. This view stresses the negative sides of the civil engineering approach to river management, in which rivers served the sectoral purposes of water transport and water discharge. Besides, it stresses the positive sides of a different, more 'natural' approach to river basin management, such as the development of nature, the purifying and absorbing capacities of aquatic ecosystems, the natural resources they provide, possibilities to develop recreational facilities and awareness raising of the presence, the value and the opportunities of healthy aquatic ecosystems (to be summarised as the discourse of 'living with water' as opposed to 'fighting against water'). This different view characterises a paradigm shift towards eco-development. Since these adaptations largely take place while keeping existing structures in tact, it can be argued that this shift takes place according to the characteristics of the trend of ecological modernisation.

5.5.3 CHARACTERISATION OF THE RIVIERENLAND-STUDY

The description of the Rivierenland-study in this subsection relates to the reason for the Ministry of Transport, Public Works and Water Management to start the study, the goals of the study, its central characteristics, the status of the study, the central themes of the study and the angle from which economic aspects of the study are addressed.

MOTIVES FOR THE MINISTRY OF V&W TO START THE RIVIERENLAND-STUDY

At the turn of the millenium, the *Dienst Weg- en Waterbouw (DWW*; Road and Water Construction Department) of the Ministry of Transport, Public Works and Water Management conducted a study called Rivierenland¹⁵⁶ to study the effects of an alternative safety concept

156 The meaning of this term is twofold: on the one hand, it refers to the interaction between the wet and dry elements of the flood plain (the river and the land). On the other hand, it refers to the area of study,

for the middle section of the major rivers in The Netherlands¹⁵⁷. The alternative safety concept is in line with the concept 'room for the river', as opposed to the traditional approach of 'corseting' the river. In short, the study concerned studying the effects of dramatically widening the floodplain of rivers and adapting human systems to the presence of water as an alternative safety strategy to further elevating existing dykes. The geographic area of study was the region between the northern dyke of the river *Nederrijn* (Lower Rhine) and the southern dyke of the river Meuse, between the upstream cities of Arnhem and Nijmegen and the downstream city of Dordrecht. The direct justification of the anticipative study of a new flood protection concept was a previous project at DWW called 'The future of the concept of dykes' (see Ministerie van Verkeer en Waterstaat, 2000b), which studied the limits of the traditional safety concept.

The task of and responsibility for flood protection has been placed with (or has been claimed by) the central water management authorities (the ministry of Transport, Public Works and Water Management, its supporting organisations and its regional executive directorates). Because of the responsibility attributed to these authorities and the liability resulting from it, these authorities want to make sure there is no misunderstanding about the degree of safety they provide. Therefore, the flood protection system has been based on strict safety standards. These safety standards are based on the expected maximum volumetric flow rate (in cubic meters per second) of the rivers at the point of entry into The Netherlands and the chance this flow rate will occur. The safety standards have been diversified, with stricter safety standards for more densely populated areas and areas with a higher economic value in terms of physical capital (such as in the western part of the country). Because of these high safety standards and the flood management system based on it, inhabitants of flood prone areas consider themselves completely safe. Therefore, housing areas and other valuable investments are planned in the lowest area of the country without hesitation. However, in recent years, the flood protection system based on the maximum volumetric flow rate has been increasingly criticised with regard to its predictive value, and thus with regard to the actual protection provided. It is argued that due to climate change the discharge patterns of rivers have become unpredictable and that a flood protection system based on the predictability of river discharge is therefore no longer a suitable approach. This argument was substantiated by high flow rates of the Meuse and Rhine in 1993 and 1995. In both years, the river water was close to toppling the dykes, whose dimensions had been based on a chance of this occurring every 1250 years.

The safety concept based on dykes and artificial water defense systems requires continuous attention. If no fundamental changes are made to river management and land use in adjacent areas, the difference between the water level in rivers and the surface level of the

namely *Rivierenland* (Land of the rivers), which to a large extent is similar to the water management area of the water board with the same name.

¹⁵⁷ With regard to this initiative, a distinction is made between the *Rivierenland*-study and the *Rivierenland*-project. The *Rivierenland*-project is a fictitious project to implement the alternative safety concept in the mentioned area. This fictitious project acts as an operationalisation of the safety concept in order to be able to analyse its consequences. The *Rivierenland*-study is the initiative of DWW in which the consequences of the alternative safety concept are studied, amongst others by means of the fictitious project.

polders will substantially increase in the future. The level of the river bed (between the 'winter dykes') will rise due to sedimentation processes, while in peaty areas, the polders adjacent to the river will subside due to processes of oxydation and mineralisation. This will increase the risk of flooding¹⁵⁸. In case of a flood, damage to deep, densely inhabited polders with a high density of investments in real estate and economic activities, will immediately be very high (Ministerie van Verkeer en Waterstaat, 2000: 4). According to the Ministry, besides the increased flood risk, a number of other negative effects of the traditional safety concept can be mentioned. First of all, maintaining an artificially low water level in the (ever deeper) polders will lead to salt intrusion. Moreover, the groundwater level in the adjacent higher areas will drop, causing problems for drinking water provision and problems of desiccation. Therefore, the present safety concept is seen as an unstable balance of human force against the force of nature. According to the Ministry, in this unstable situation, Dutch society cannot permit itself a moment of negligence (Ministerie van Verkeer en Waterstaat, 2000: 7). In critical situations, she argues, the real protection provided by the traditional system is highly dependent on the proper operation of the system by (fallible) people.

According to the initiators of the study, the presently stable political, social and economic situation in The Netherlands may not continue in the future. Under changing (unstable) societal conditions, the 'high maintenance' defense system, depending on vigilance and proper functioning technology, may not be dependable. In the *PvA* of the Rivierenland-study, it is therefore argued that the present, traditional safety concept of '*water keren*' does not guarantee safety in the long-term. The question resulting from this observation is whether it would be possible to switch to a different safety approach, which is less dependent on the exact flow rate, the physical condition of the defense system and the proper operation of this system. According to the project plan of the Rivierenland-study, the key to this may lie in a radically different safety concept. This concept is interpreted in such a radical way, that even (small scale, fragmented) adaptations to the existing system in order to enhance the discharge capacity of rivers (vertically or horizontally), such as bypasses and retention polders, do not fit in the concept. The reason that these measures are not allowed in the concept is that although they may be effective measures to provide relief for some time, they do not change the root cause of 'unsafety', namely the fact that the river bed lies above the level of the surrounding land (Ministerie van Verkeer en Waterstaat, 2000).

According to the *PvA*, in the new concept the sharp separation of land and water will change into broad zones that are alternatively wet and dry. In this zone, the processes of sedimentation and 'landshaping' are allowed to take place again. According to the concept, a robust form of safety can (only) be created if vital societal functions like living and working are adapted to the new situation. Examples of such adaptations are elevated infrastructure and residential areas. In the project plan (*plan van aanpak, PvA*) of the Rivierenland-study, it is stated that in Dutch society, because of the traditional approach to flood protection, water seems to have been excluded from the mental framework of its inhabitants. It is the belief of the project-team that safety is created not by 'turning away from the water' but by 'living with it'. The Rivierenland-study aimed to investigate to what extent the idea of 'water as a spatial planning principle' can be shaped in practice. The motivation to execute the explorative study is rooted in the conviction that the concept can offer great opportunities.

¹⁵⁸ (Flood) Risk is defined here as the chance of an event times its effects.

The study was to make clear if these opportunities indeed existed and whether these could be applied in a practicable way. If so, this would offer a fundament for communication with the political and societal arenas.

CONCRETE GOALS OF THE PROJECT

The central aim of the study was to 'make a contribution to solving the very important issue for Dutch society of flood protection in the long-term' (Ministerie van Verkeer en Waterstaat, 2000: 22). One of the secondary goals was to study the usefulness of a safety concept that does not depend entirely on dykes. According to the *PvA* the new safety concept studied is more robust because, contrary to the traditional safety concept, it does guarantee safety, since 'living and working' will no longer be threatened by water that rises above land level. The aim with regard to deliverables is to come up with a rough foundation for the alternative safety concept based on facts and reasonable expectations and projections.

Rivers in The Netherlands have been corseted for centuries in a row, and therefore, there is wide expertise on how to do this. Reversing this process by giving land back to water, which is the core principle of the 'room for river' approach, is new to Dutch water managers, and to Dutch society as a whole. Therefore, no knowledge exists about the effects of this process, on how best to approach the process itself and on the support for this process in society. The fictitious 'Rivierenland'-project can therefore also be regarded as a good opportunity to study the consequences of a concrete elaboration of the 'room for rivers'-concept. Generation of knowledge was identified by Wiering and Immink (2003) as an important resource for substantiating new approaches in water management. Moreover, because it was a fictitious project, it provided a good opportunity to carefully introduce the 'room for rivers'-concept as a potential alternative to water managers, to stakeholders in water management, and to society as a whole. According to the *PvA*, societal conditions to introduce the concept were right at the time the project was started. Because of the near floods of major rivers in the 1990s, more than in previous years, a societal and political debate was taking place about flood protection in the coming centuries. The Ministry thus explicitly used the occurrence of a shock effect to initiate a paradigm-shift in water management. The explorative study was meant to yield enough data to judge the applicability of the new safety concept. Questions of feasibility and acceptability were not part of the study and remained fully open to political and societal debate.

CHARACTERISTICS OF THE STUDY

Time scale

After the near floods of 1993 and 1995, it was decided that over a period of 10 to 20 years, additional measures would be taken to give room to rivers and to deploy retention areas. At the time of the start of the Rivierenland-study, the round of dyke reinforcements as a reaction to the near floods in the 1990s was almost finished. After the completion of the dyke reinforcements, a flood protection programme would be planned and executed for the remaining period (of about 15 years), in which a range of spatial measures would be taken to reduce flood risk, by increasing storage and discharge capacity of the rivers. Although already based more on the strategy of giving room to rivers, these measures are still rather

consolidating in nature (i.e. they do not structurally change the spatial planning of the river bed) and their effects may be sufficient for a relatively short period of time. Contrary to these measures, the aim of the *Rivierenland*-study is to study the effects of flood protection measures over a very long time scale of about 500 years. One of the reasons for studying such a long-term in the project is that in that timespan, the physical trends causing the changes in river discharge and flood risks can be considered substantial. Another reason was that the study aimed to analyse the sustainability of the alternative safety concepts under consideration. Inherent to the concept of sustainability as formulated in the Brundtland-report (WCED, 1987: 43) is the consideration of the effect of present-day actions on future generations. This aspect was therefore an explicit precondition in the *Rivierenland*-project.

Other characteristics

Characteristics of the alternative safety concept

The *PvA* mentions the following key characteristics of the new safety concept:

- *Rivierenland* is a concept for a thinking pattern that has a different approach to high water in rivers. The concept is new because it does not take the present dykes in their present position as a given fact;
- The new safety concept reinforces 'experiencing' water and therewith enhances the consciousness in society of the value of water. Water is accepted again as part of the living environment;
- The concept halts the process of soil subsidence caused by human intervention in water systems. The concept allows water to play a role in shaping the land and increases the absorption capacity of peat soils, which may help address future problems with fresh water stocks. Through these mechanisms, it meets the pursuit of resilience and sustainability;
- *Rivierenland* by its nature is a flexible concept, not a blueprint in which units and relationships are fixed. In the course of time it allows for development of the concept as a reaction to changes that were not foreseen at the start. The conceptual character gives a permanent incentive to think in a creative and innovative way.

The key characteristics mentioned above reflect a number of (direct and indirect) purposes of the project. The first characteristic refers to a new normative discourse about flood protection in which flexibility plays a central role. The second characteristic hints at a paradigm shift in which ecosystems are regarded as valuable sources of a wide range of products and services, not just from the perspective as resource for economic processes. Besides, it draws a picture of 'co-existence' of natural and human ecosystems¹⁵⁹ and of permanently raising awareness of the dynamics of water systems. The third characteristic claims that the approach is inherently more sustainable, since it halts a number of undesirable developments caused by human action and provides for a number of other, desirable services. The fourth characteristic refers to a new style of governance, in which flexibility is introduced, which enables adaptations to changing circumstances. Besides, it claims not to take a top-down approach (no 'blueprint'), but an approach in which the 'solution' is the result of a process of learning, negotiations, interactions and communication, in short, the result of co-operative action. This approach is to prevent situations of lock-in

¹⁵⁹ These characteristics show that this concept fits in the eco-development paradigm.

due to high investments in infrastructure and organisation, which fix a policy approach for a long period of time. In other words, the concept takes bounded rationality and incompleteness as a starting points. This is also a basic assumption of the 'room for water'-arrangements at the regional and local level. From the discussion of the central characteristics, it can be concluded that the concept meets most of the central characteristics of integrated water management. The study aims to assess whether there is scientific legitimisation for this alternative approach based on principles and concepts of sustainability.

Status of the Rivierenland-study

The new safety concept in the first place will have the status of a vision. This vision is to play a role in processes of policymaking, management and spatial planning in a broad circuit. The aim is to test all initiatives with regard to spatial planning, regional economic development policy, water management and soil use against the starting points of the new safety concept. As such, the concept will act as a compass for spatial planning in the area of study (Ministerie van Verkeer en Waterstaat, 2000: 8). From this description, it can be concluded that the Rivierenland-project aims to change water quantity management by influencing stakeholders of water quantity related public projects and policy programs at a fundamental level, namely that of policy paradigms relating to the man-nature relationship. Whereas the official aim of the project is a neutral one, namely to generate knowledge with regard to the feasibility of a new safety approach, the underlying aim is normative in nature, namely changing the attitude of involved stakeholders and the public at large with regard to flood protection.

CENTRAL THEMES OF THE PROJECT

In order to be able to study various aspects of the new safety concept, the Rivierenland-project was divided into clusters based on different scientific disciplines. Within each of the clusters, employees of the *Dienst Weg- en Waterbouw* (DWW) acted as coordinators. For partial studies within each cluster, scientific institutes and consultancies were contacted. The issues studied in the Rivierenland-project were grouped according to the following clusters:

- Dynamics within a natural system
- Livability and manageability
- Economic and societal costs and benefits
- Management, governance and international tuning

THE ECONOMIC DIMENSION OF THE RIVIERENLAND-STUDY

The alternative approaches studied in the Rivierenland-study can be regarded as the opposite ends of a spectrum of conceivable approaches to river flood protection. The 'defending land against water' (or 'stemming the water')-approach can be regarded as the 'business as usual'-approach, while the 'room for rivers'-approach can be regarded as a radical break with the traditional approach. The socio-economic consequences of these two opposite alternative approaches were studied in the cluster 'Economic and societal costs and benefits' of the Rivierenland-project. A working agreement was established between DWW and ESM to cooperate in this cluster. The cooperation gave DWW the opportunity to attract

scientific expertise from outside its own organisation. At the same time, it provided me with the opportunity to conduct participative observation-research within the project.

The aim of the cluster 'economic and societal costs and benefits' was to come up with a rough estimation of societal costs and benefits. For this purpose, the societal costs and benefits of the new safety concept were compared with the expected costs and benefits to the study-area in case of a continuation of the existing safety concept. The expectation on forehand was that the main societal costs of the alternative safety concept would consist of damage to soil, houses, business parks and industrial zones, infrastructure and productivity in the project area. The expected main benefits were a reduced flood risk downstream and adjacent to the project area and new economic opportunities within it. The new concept was expected to have far-reaching consequences for transport and logistical systems. Whether these consequences would be positive or negative remained open at the start of the study. Values that could not be quantified or 'monetised' in this study, were to be presented in the results in a qualitative way. For each economic sector, the effects of the new safety concept were to be studied in terms of chances for survival and positive and negative perspectives. Potential new opportunities were expected in the exploitation of surface minerals such as sand and clay. Another potential economic source is the large stock of clean fresh water that fills the deeper parts of the Rivierenland-area via infiltration.

One of the end-products of the cluster was a report with the title '*Economische inzichten rondom Rivierenland-concept*' (economic insights in the Rivierenland-concept) (Ministerie van Verkeer en Waterstaat, 2001). The report was made of three partial studies: Part A: 'Kosten en baten van een alternatief veiligheidsconcept' (costs and benefits of an alternative safety concept) by Schuijt (ESM); part B: 'Economische evaluatiemethoden in de besluitvorming over het Rivierenlandproject' (economic evaluation methods in the decision-making process regarding the Rivierenland-project) by Boot (ESM); and part C: 'Winning van oppervlaktedelfstoffen in relatie tot de waarde van gebieden, een aanzet tot kwantificering op basis van veiligheid tegen overstromen' (Recovery of surface minerals related to the value of areas, a first step towards quantification based on protection against flooding), by Otten and Verster of NEI (*Nederlands Economisch Instituut*; the Dutch Economic Institute). The description in this section addresses solely part B.

5.5.4 MACRO-LEVEL ANALYSIS: TRENDS IN SOCIETY AND NATURE

A number of physical and societal developments can be identified that influence the decision-making about river flood management. A number of societal developments were already mentioned before. The first is economic growth, reflected in continued investments in capital in flood prone areas. A second development (which has evolved in the course of decades, even centuries) is the delegation of water management tasks to specialised functional government organisations, thus taking water management 'out of view' of other actors in society. This decreasing awareness is the result of sectoral water management, which aimed to optimally serve (more important) economic activities. Another characteristic of sectoral water management is a technocratic approach, which has created a strong dependence on technology and stability. A third development, related to this, is the development of society into a highly institutionalised society in which risks are not accepted as a fact of life. These factors in general reinforce the existing policy approach to flood protection.

Counter to these societal developments run a number of developments that act as driving forces for a change in the approach to flood protection. The first development is the increasing awareness of other values and functions of rivers, river beds and river basins as a whole, such as the ecological value, the value of healthy aquatic ecosystems providing goods and services to society and the esthetic and recreational value. This increased awareness of these values is part of the trend of 'emergence of post-material values'. The second development is a call for cost-effective management of public facilities. The traditional flood protection system is expected to become very costly in the future, because of a required continued (increase in) investments in the structure itself, but also in terms of public costs in case of a failure of this defense system. Besides, water management in adjacent areas will become increasingly expensive because water has to be pumped out over higher vertical distances into the primary system. This development can be indicated as part of the trend of scientification, and especially 'economisation'. These societal developments 'calling for' a change in approach are reinforced by a number of physical developments. The main physical developments (either or not caused by human activities) are climate change, resulting in higher extremes in river flow rates, sedimentation of soil particles in the winter bed of the river and soil subsidence in peat areas, both increasing the position of the river relative to the adjacent land, thus increasing the risk of flooding through the factor 'effect'¹⁶⁰. These processes create an increased pressure on the existing flood defense system. One physical factor which acted as a direct occasion for a different approach was the shock event of near floods in the 1990s. Because of the importance of this external factor, it will be discussed separately below.

THE ROLE OF SHOCK EVENTS

Wiering and Immink give several examples of the effect of shock events on the institutional setting in water management. The most striking flood related example of the previous century is (of course) the flood in the south-western part of The Netherlands in 1953. More recent examples are the high water levels in the major rivers in December 1993 and January 1995. These led to a sudden change in the character of the policy arrangement for flood management. In the 1970s, continued dyke reinforcements had led to increasing societal perturbation. Two discourse coalitions emerged from this societal debate: on the one hand water management organisations (Rijkswaterstaat and water boards) that stressed the safety aspect, arguing purely from a water quantity management perspective. On the other hand environmental and nature conservation organisations, together with inhabitants of the areas around the major rivers, that wished to protect and preserve the unique landscape, its cultural history and its nature values. After the 'near disasters' of January 1995, the government was forced to act quickly to ease societal (feeling of) uncertainty and restore trust in water management. In the spring of 1995, the central government launched an emergency plan to execute dyke reinforcements along the major rivers at an enhanced rate (*Deltaplan Grote Rivieren*). By a concentration (and centralisation) of decision-making, shortened procedures for public participation and legal protection, and the possibility of immediate confiscation of real estate as a result of a special act (*Deltawet grote rivieren*, Delta-act for the major rivers), this operation was performed in a short time span (Driessen

¹⁶⁰ Flood risk was defined earlier as chance of flooding times its effect.

and De Gier, 1997; De Gier and Driessen, 1998). The second phase of dyke reinforcements was performed under the regime of the, again temporary, Water defence act (*Wet op de waterkering*) (Driessen, De Gier and Wiering, 1999).

In terms of policy arrangements, Wiering and Immink (2003) show that the 'shock event' of 1995, in this case the physical phenomenon of high flow rates and near floods, broke the deadlock between the water managers (probably supported by the water transport sector and public authorities of riparian areas) on the one hand and the coalition of nature conservation organisations and defenders of the characteristic flood plain landscape on the other. In the first place, the event changed the discursive 'space'. The 'safety first' discourse received more political and societal support, but at the same time had to be interwoven with the interests of landscape, cultural history and nature protection. This way, an integrated discourse emerged within the dominant thought of 'flood protection'. This integrated discourse can be clearly identified in the double policy goal of the draft *PKB 'Ruimte voor de Rivier'* (the central planning decision 'Room for the river'), which combines the goals of 'safety' and 'landscape value'. Because advice about the policy process regarding dyke reinforcements was already pre-fabricated in a temporary state commission (Commissie Boertien I), rules of the game could be altered quickly (the commission's advice acted as a democratic legitimisation for new or extra-judicial measures). Emergency legislation was introduced, including prescribed, 'frozen' safety norms and the fixation of government competencies. These institutional changes were accompanied by indirect central steering by means of financial resources and were combined with integrated and interactive policy implementation (environmental impact assessment, taking account of the advice of Commissie Boertien and special requirements for the policy process). Looking back, the near floods of the 1990s in the first place led to accelerated execution of dyke reinforcements within the 'old' discourse. At the same time, however, they have been important for the accelerated introduction of renewing story lines (such as 'room for the river') (Wiering and Immink, 2003). The *Rivierenland*-project is an example of the institutionalisation of these new story lines within the organisational structure of Rijkswaterstaat.

Notwithstanding the importance of the shock event as a 'spark' to set a change in the discourse about flood protection in motion, the attention for alternative approaches to river flood protection does not result from the mentioned shock events alone. The shock events mentioned might just as well have led to a reinforcement of the existing flood protection strategy. Therefore, other developments in society will be needed as a breeding ground for a change in discourse. More specifically, a changing relationship between humans and their physical environment (changing paradigms about the man-nature relationship) and political modernisation (a changing relationship between state, market and society) are likely to be the true driving forces. The changing paradigm on the man-nature relationship is represented by the concept of 'integrated water management' at large, and more specifically by the 'water systems approach' and the 'eco-pragmatism'-approach that are considered to be part of it. With regard to political modernisation, government authorities are rethinking their role in many policy domains, including water management. Trends like deregulation, efficiency of public management and the shift from government to governance lie at the heart of this. Questions with regard to water management in this respect are whether more services with regard to water quantity management can be provided to society via the

market mechanism and whether the (national) government should be fully responsible for providing protection against water.

5.5.5 MESO-LEVEL ANALYSIS

DISCOURSES ABOUT FLOOD PROTECTION

Ontological discourse: is there a problem?

The ontological discourse regarding flood protection centres around the question whether or not there is such a phenomenon as climate change, and if so, whether or not this climate change causes more extreme discharge patterns (flow rates) in the major rivers of The Netherlands. With regard to this discourse, it can be said that there is scientific consensus about the occurrence of climate change. A (far) lower degree of consensus exists about the question what the consequences of this climate change will be for the discharge patterns of the major rivers of The Netherlands. The dominant discourse in this respect at the moment is that climate change will indeed lead to these more extreme situations of river discharge and that (thus) additional measures for flood protection are required. On the one hand, it is expected that precipitation will be more concentrated in (narrow) time intervals, causing more fluctuation in discharge. On the other hand, the melting of permanent snow and ice in the Alps is expected to result in situation that the river Rhine will get the character of a rainfed river, which in general show stronger fluctuations in flow rate. The dominance of this discourse (both with regard to water from abroad and precipitation in The Netherlands itself) is reflected in a joint campaign by various public water management organisations. The ontological discourse was not analysed in more detail in the context of this thesis.

Influence of the ontological discourse on the normative discourse

The dominant ontological discourse influences the normative and strategic discourses on flood protection. The dominant normative discourse until the 1980s was that of dyke reinforcements (*water keren*). In case the dominant ontological discourse would have been that peak discharges would not increase, the traditional modernistic approach of controlling the river by means of dykes and other artificial protection structures would probably have been continued. Although the influence of climate change on patterns of precipitation in the river basins of the major rivers has not been established conclusively yet, the probability that this mechanism will occur has led to a rethinking of the flood protection strategy for the future. From a technical perspective, the system of dykes, dams and other artificial structures for flood protection can probably be continued and even improved for some time to come, even if these changes in discharge patterns do occur. However, water managers seem to practice the 'precautionary principle' in this issue by anticipating future societal and physical developments which in the long-term may force the shift to a different flood protection strategy after all. In this discourse, it is not the feasibility of different strategies that plays a crucial role, but rather the desirability. From the perspective of desirability, doubts have risen regarding the continuation of the traditional approach. This criterion of desirability is influenced by macro-level societal developments, such as changing preferences, demands and desires, and changes in governance. The dominant ontological discourse about climate change and discharge patterns in this respect is needed as

legitimation for the normative discourse about strategies for flood protection. The debate about desirability will be further addressed in the analysis of the strategic discourse.

Normative discourse about flood protection

Levels of normative discourse

As was discussed before, the *Rivierenland*-concept can be seen as an extreme exponent of the 'room for the river'-discourse. In total, three levels of normative discourse can be distinguished that are related to this study: firstly, with regard to various aspects of water quantity management, a debate takes place about 'old' versus 'new' approaches, based on different paradigms. The old approach represents the modernist paradigm of 'manageability' of society and control over natural processes. The new approach represents more post-modern paradigms of 'resource management' or 'eco-development', in which society tries to adapt to the possibilities and preconditions of natural systems and processes. This approach is represented by concepts such as 'room for water', 'water systems approach', 'water as a guiding principle'. The debate between old and new was typified as 'stemming water' versus 'accommodating (to) water'. This level of normative discourse was already addressed to some extent at the beginning of this chapter and will therefore not be discussed here.

The second level of discourse is the exponent of this debate with regard to flood protection. In the old approach, the normative discourse is that of 'stemming the water'. Measures in this approach (the strategic discourse) are dykes and other artificial 'hard' flood protection structures and systems. These measures are taken at the edge of the flood plain and keep a sharp distinction between wet and dry areas in tact. Other measures that take place in the flood plain itself, but that can be shared under the 'old' approach are artificial lowering of the flood plain by digging off soil and the removal of obstacles in the flood plain. These measures aim to enhance storage and discharge capacity within the traditional boundaries. In the new approach, the normative discourse is that of 'room for the river'. Measures to adopt to changing circumstances are river bypasses, dyke setbacks, retention and calamity areas, etcetera. These measures aim to enhance storage and discharge capacity of the rivers by crossing the traditional boundaries of the so called 'winter dykes', which protect the dry land in times of high river discharge volumes.

The third level of discourse is that of the *Rivierenland*-study as a whole. The alternative approach studied in the *Rivierenland*-study can be regarded as an extreme version of the 'room for the river'-discourse. Whereas the measures with regard to the 'room for river'-concept as mentioned above still leave the traditional boundaries between wet and dry land to a large extent in tact, the *Rivierenland*-concept goes a step further in mixing wet and dry areas and in combining wet and dry land use functions. As such, boundaries between wet and dry fade away and a transitional zone is created. The question in this discourse is whether this extreme version can be considered a serious concept or alternative to give an interpretation to the 'room for the river'-concept. In order to get an answer to this question, tools for project evaluation will need to be developed that assess the feasibility of alternative approaches from various angles. One such angle is the economic one. The discourse about the role and content of tools for economic evaluation of project alternatives constitutes the subject of the strategic discourse addressed in this thesis.

Discourse about the need for a new approach to flood protection

Characterisation of the traditional safety approach and its negative side-effects

For centuries, the issue of river flood protection was dominated by the 'struggle against water'. In this approach, water was regarded as an enemy that, just as foreign military forces, had to be fought against and expelled from the country as much as possible. Operational concepts of this approach can be indicated as 'reclaiming' and 'taming'. In order to make maximum use of the fertile delta created by the rivers flowing through The Netherlands, as much land was reclaimed from the sea, lakes, rivers and smaller water systems as possible. Reclaiming land from water was also a pro-active approach in reducing the risk of land being reclaimed (flooded or eroded) by 'the hungry water wolf'. The old and new land were protected from the threat of the remaining (but strongly reduced area of) water by artificial constructions such as dykes and dams. This way, a sharp distinction was created between water and land. The trust in human capacity to tame, control and manipulate the remaining water systems was so high that water as an omni- and ever present aspect in the daily live of Dutch society diminished to negligible proportions. Towns and cities that had traditionally depended on water systems for various purposes, amongst others for trade (such as the *Hanzesteden*), which could be recognised in the street plan and location of high value real estate, turned their 'senses' away from the water front. One of the consequences of this development was that society became more and more dependent on public water authorities to guarantee their safety. This also resulted in the submission of claims in case of flood damage filed on public authorities, which were held responsible for this damage. As a result of the high costs of maintaining and managing an ever more complex system of artificial flood defense structures and because of the liability for damage, the costs of flood protection for public water authorities have risen continuously in the past centuries. Besides, in recent years, the artificial water quantity management system in The Netherlands has received growing critique because of its negative side effects. Because of the combination of these factors doubts have been cast by several actors in both societal, political, administrative and scientific arenas on the desirability to maintain the existing situation and policy approach.

As was described above, in the past centuries, the Dutch land was protected by constructing dykes and by continuously reinforcing and elevating these dykes. As a consequence, processes of erosion and sedimentation that had shaped the landscape before this human intervention in the river system had come to a halt. Whereas the river banks and floodplains used to grow with every flood, this was no longer the case. The silt transported by the river was now deposited further downstream, in the delta. This caused a new management problem, in the form of harbors in the delta becoming silted up. Since in the constricted rivers, the silt could only settle in the narrow floodplain between the winter dykes, only this narrow area could grow in a vertical direction, increasing the difference in height between the river bed and the surrounding land. Because of this continuous process, from time to time dykes have to be elevated or the flood plains have to be lowered in order to be able to store and discharge the passing water. The height difference between the river and the surrounding land was also increased by another long-term process, namely that of soil subsidence. This man-induced process is reinforced by the tilting of the tectonic plate The Netherlands is situated on. This tilting caused the northern and western parts of the country to subside, while the eastern and southern parts of the country are elevated. As was mentioned before, because of the increasing height difference between the dykes (which are

adapted to the water level in the rivers) and the surface level in the polder, damage in case of a flood will be higher much higher, because of a higher inundation level. Besides, the arable land around the rivers that used to be sparsely populated, nowadays is densely populated. Because of the substantially increased capital (of various kinds) in these areas, the effects of a potential flood have increased considerably as well¹⁶¹.

The need for and positive effects of an alternative safety approach

As a consequence of its negative effects and catalysed by a number of developments in society (see the part about macro-developments), in the course of the 1990s, doubts rose about the normative discourse of 'defending against water' (*water keren*). This doubt has been typified as the 'control paradox' (*beheersingsparadox*) (Rommelzwaal & Vroon, 2000). The control strategy of 'water defence' can lead to a vicious circle, because traditional measures of dyke reinforcements and -elevations do not solve the cause of the safety problem¹⁶². Various actors in different arenas (especially the scientific, political and administrative arenas) started developing alternative approaches to flood protection. Most of these alternative approaches can (to a large extent) be clustered under the concept of 'room for rivers'. The central line of reasoning is that the traditional approach of water quantity management essentially stores water in a vertical direction, thus increasing the pressure on (and dependence on) the artificial water management structure and increasing the consequences of floods in case of failure of this structure. Therefore, the room for rivers approach pleads for accommodating surpluses of water in a horizontal direction, by increasing the area for water storage. Just as the concept of 'room for water', 'room for the river' has been adopted in a number of policy resolutions, such as the policy advice of the Commission for water management in the 21st century (*Commissie waterbeheer 21ste eeuw*), which was ratified by the cabinet.

The discourse of 'accommodating water' is argued to be more integrative in nature than that of 'water defence'. In the first place, the approach is not a matter of a 'struggle against' water. On the contrary, 'living with water' is taken as the starting point. Central in this approach is co-operation with natural processes¹⁶³ and dealing with insecurity by anticipating instead of reacting. This thought is central in the alternative approach studied in the Rivierenland-study. These starting points of the 'accommodating water'-discourse are not free of obligations. Water is assigned a steering role as a spatial planning principle. Because land use and water management are approached jointly, the distinction between land and water is fading. Wiering and Immink state that both discourses (the old and the new) are amongst others expressed in the *Startnotitie 'ruimte voor de rivier'* (declaration of intent 'room for the river') (Ministerie van Verkeer en Waterstaat, 2002a). This policy resolution is accompanied by new rules of the game (in this case more or less formal policy principles), such as the desire for 'more room for water besides technological measures' and the thought

¹⁶¹ The continued investments in flood prone areas is often attributed to a (false) sense of security created by 'water management out of sight' (discharging water behind high dykes under highly controlled circumstances).

¹⁶² Besides increasing due to increasing peak flows and rising river beds, the chance of floods increases by the ageing of defense structures on which this flood defense mechanism depends.

¹⁶³ An expected advantage of 'letting nature do its job', is that nature can provide for some products and services more efficiently and (thus) cost-effectively than man can do itself. Examples are the water retaining and purifying capacities of wetlands. This notion is central in the eco-development paradigm.

of 'not passing on responsibilities', and by new resources, especially the generation of ecological knowledge.

Many types of measures can be shared under the heading of 'room for rivers'. The measures considered can be found at various positions on a gliding scale, with on the one hand reactive measures such as flood polders, by-passes and flood plain excavations, to more proactive measures such as structurally widening the 'winter bed' of the rivers. The Rivierenland-concept is at the far end of the proactive side of the gliding scale. Whereas the widening of the winter bed maintains the strict separation of wet and dry areas (the number of 'dry functions' of the land is mainly limited to extensive agriculture and recreation), in the Rivierenland-concept the interaction between wet and dry functions takes place in various gradations.

Strategic discourse regarding economic evaluation of alternatives

The strategic discourse regarding flood protection discussed in this section considers the content and role of tools for economic project evaluation in the Rivierenland-study. The role of the tool(s) for economic project evaluation relates to the question raised in the normative discourse, regarding the 'seriousness' of various alternative approaches to flood protection. The question with regard to the tool(s) for economic project evaluation is therefore: what contribution can this/these tool(s) make to the assessment whether or not the Rivierenland-concept can be regarded a serious alternative? The crucial issue with regard to this question is the word 'serious'. This word represents one or several criteria on the basis of which the desirability and feasibility of the concept can be assessed. These assessment criteria can be of diverse nature, often depending on the interests of the actors involved in the assessment process. In chapter 3, these criteria were divided into technical criteria (*optimality*) and political criteria (*concordance*). The political criteria relate to the acceptability of the new safety concept to actors and actor coalitions in the policymaking process (the third level of normative discourse) and to the role of tools for economic project and policy evaluation to assess this acceptability (strategic discourse). The technical criteria relate to the demands placed on the content of the tool, resulting from the political criteria. These criteria relate to the question whether or not the tool can and will do the desired job and at an acceptable performance level.

What follows from the introduction of the Rivierenland-project, is that it is not only special because of the completely different approach to safety, but also because of the methodological complications of studying the consequences of present-day activities for the very long-term. The economic perspective is no exception in this respect. On the contrary, the discrepancy between the preconditions of the study and methods to study effects within the boundaries of these preconditions is probably largest in this respect. The instruments for economic analysis of projects presently used usually limit studying the effects of these projects to at most 50 years. Any effects beyond this date do not count in these economic analyses, let alone those that occur in 250 or 500 years time. This 'mismatch' between the long-term perspective of the study and the time horizon of conventional economic tools for project evaluation was expressed by the coordinators of the 'economics cluster' in a workshop in May 2000. The main result of a session about the economics cluster was presented as such: 'the cluster economics got stuck on the impossibility to do anything with the presently applicable economic models on a time scale of hundreds of years. The

economic specialists could not or would not project themselves in completely different economic paradigms, as suggested by some other participants of the session, such as an economy without competition' (Ministerie van Verkeer en Waterstaat, 2000b: 3).

In this subsection, the discourses about the role and the content of methods for economic project evaluation will be presented, starting with discourse about the content. The subsection following this one will discuss a number of specific characteristic aspects of the Rivierenland-study and possible ways to deal with these characteristics in economic evaluations.

Discourse about the content of economic evaluation of public projects

Above, it was indicated that the economic experts of the Rivierenland-study shared the opinion that with the presently 'applicable'¹⁶⁴ economic models, no useful results could be obtained from economic project evaluation for the Rivierenland-study. A major factor with regard to the balancing of impacts occurring over time is the discount-factor. Therefore, the discount-factor plays a crucial role in the Rivierenland-study. That is the reason for focusing on this technique from the perspective of scientific discourse. After that, a section will be devoted to the position of *imponderabilia* (effects that cannot be expressed in monetary terms) in economic project evaluation.

Discounting

A significant part of the debate about economic (e-)valuation deals with the practice of discounting and the choice of the discount rate. Hanley and Spash (1993) state that the practice of discounting makes actions responsible for long-term losses attractive. Project effects that take place in the future are given less weight when they are being discounted with a positive discount rate. Furthermore, environmental effects often arise after a long period of time, so discounting tends to give environmental effects less weight in a cost-benefit analysis. Hence, they say, discounting discriminates against future generations and against the environment.

The choice of the discount rate is also a source for debate since it biases outcomes. For example, policymakers may act in their selfish short-term interest in order to maximise their votes, which leads them to prefer a higher discount rate such that benefits accruing today are increased (Wills, 1997). The choice of the discount rate is therefore prone to manipulation for the benefit of policymakers, not the environment. On the other side, Pearce and Turner (1990) dispute the fact that discounting leads to environmental degradation. They argue that there is no unique relationship between discount rates and environmental degradation. According to them, research has shown positive discount rates can result in diverging effects on the environment. Furthermore, research by Cropper and Portney (1992) has shown that the public is generally very present oriented, which in their view justifies the use of positive as opposed to zero or even negative discount rates. Whether peoples' individual time rate preference is a proper justification for using positive discount rates for public projects can however be questioned.

¹⁶⁴ It was not clarified from observation and analysis whether 'applicability' was judged from a scientific, methodological perspective or from a pragmatic, political or administrative perspective.

From the description above, it can be (carefully) concluded that positive discounting tends to discriminate against the environment. Representatives of the environment in society (f.e. environmental and nature NGO's, public authorities) in principle have two ways of improving this representation of the environment in decision-making: arguing that the process and technical specifications of economic evaluation methods should be changed (i.e. changing the content of the method), or that the role of the present form of economic evaluation should be limited or diminished in the decision-making process about projects or project alternatives (i.e. changing the role of the method). The discourses about the content on the one hand and the role on the other are different, but interrelated. It can be stated that the discussion about the role of economic evaluation methods in policymaking tends to be more fundamental in nature, since actors that oppose to the use of economic evaluation methods at all tend to adhere a more radical ecological paradigm than actors that may agree with the use of economic evaluation methods, but do not necessarily agree with the method itself. The combined trends towards quantification and towards rationalisation of ecology forced environmental and nature NGOs to give up the radical position with regard to the role of economic (e-)valuation (i.e. no economic (e-)valuation) and engage in discourse about the methods themselves.

Scientific discourse about discounting related to studying effects over a long time horizon

For the purpose of studying the scientific discourse about discounting, a parallel was drawn with the economic evaluation of climate change policy. In this policy domain, several types of ethical and economic issues (including the discounting factor) play a role in the debate about studying the long-term effects of climate change and policy addressing it.

The issue of discounting considers the question how to deal with the valuation of effects (costs and benefits) of projects or programs that occur in the future. A number of arguments lie at the base of the principle of discounting. Firstly, it can be used as a mechanism to include in economic evaluations the economic effects of investing capital needed for a project (or project alternative) in a different way. This option, expressed in economic value, is referred to as the opportunity cost of capital. A second argument is that future costs and benefits weigh less in the valuation of effects as a result of insecurity and impatience. If a rational individual can choose between obtaining an amount of money now and obtaining an amount of money in thirty years time, he will choose the first option, not just because of the possibility to invest this capital in projects or saving accounts with a positive rate of return, or because of an expected inflation of the monetary unit, but also because of insecurity about the future: will the individual still live in 30 years time? Will he need the money more in 30 years time than he does now? A third argument is the expectation that the economy will continue to grow for the next century, so that future generations will be richer than the present one. As a consequence, they will have more financial resources to compensate for the negative effects (for example on the environment) caused by the execution of the project.

Discounting is a crucial issue in economic studies of issues of sustainability. The debate about discounting in relation to climate policy revolves on the one hand around the height of the discount factor, and on the other hand around the question whether or not discounting is indeed crucial in studying (the economic aspects of) long-term issues. According to Gerlagh and Van der Zwaan (1999), the debate about the discount factor in sustainability issues is

based on a presumed relationship between 'pure time preference', economic growth and the interest rate (set by banks for loans). According to Azar & Sterner (1996), two different approaches exist with regard to the choice of the discount factor. The first is based on the 'opportunity cost of capital' (OCC) and the other is based on the 'social rate of time preference' (SRTP). The idea of OCC was already addressed above. In their article, Azar & Sterner focus on the SRTP. According to these authors, the SRTP is composed of two components: the expectation that we will be richer in the future and the 'pure time preference' (PTP). The expectation that we will be richer in the future is often linked to the decrease of marginal utility with an increase of consumption. If we (assume that we) will be richer in the future, an extra unit of money now has a larger marginal utility than an extra unit available in the future. This idea is called the decreasing marginal utility of consumption. The PTP is often rationalised in terms of impatience and insecurity about the future existence of individuals and mankind in general. With regard to economic evaluation of public projects, it can be stated that impatience and insecurity about the future existence of individuals should not play a role. This may be somewhat different for the future existence of mankind (or in the case of Rivierenland: Dutch society). According to several authors (Ramsey, 1928; Broome, 1992; Cline, 1992; Spash, 1994 and Azar & Sterner, 1996), there is no proper ethical justification of the use of a rate of pure time preference (RPTP) larger than zero.

Other authors do not so much address the issue of the proper rate of the discount factor but question the justification of this mechanism in itself. Schelling (1995) for example, states that with regard to the debate about the benefits of climate policy, discounting is not a suitable concept because of the use of the rate of pure time preference based on individual preferences. With regard to investments in climate policy, Schelling (*idem*) states that the debate should not address the question which investments in the reductions of emissions lead to the highest return on investment, but rather the choice between investments in emission-reductions and other types of investments with a high marginal utility, such as projects with short term effects on public health, birth control, education and training, research, etcetera, especially in developing countries (*idem*). Although apparently not directly relevant for the economic evaluation of the alternative flood protection concepts studied in the Rivierenland-study, some comments can be made in this respect. The statement that the real issue is the choice between projects with a high marginal utility leads to the conclusion that Schelling does approve of using the opportunity cost of capital criterion for determining the discount rate. Therefore, this would also be the criterion for choosing a discount rate for the economic evaluation of the two flood protection approaches. This would still lead to the conclusion that a positive discount rate negatively affects the feasibility of the alternative safety concept. Introducing (and evaluating) the alternative approach stepwise, and so spreading the investment costs over time, would to some extent bypass the imbalance between (short term) costs and (long-term) benefits of the alternative safety concept.

Imponderabilia

Indirect effects

Indirect effects are all effects that do not directly relate to a project (effects that do not directly influence the costs and benefits for developers and users of a project), but that result from the direct effects (Eijgenraam et al., 2000: 42). Indirect project effects are in general hard to identify, let alone quantify, either or not in monetary terms. In case of a

project for dry infrastructure, the developers and users, and the effects of the project on these direct stakeholders, may be easily identified. Therefore, the identification and 'monetisation' of indirect effects resulting from the direct effects may be feasible too. In case of a project such as public measures for flood protection, the actors directly involved and the costs and benefits for these actors are not so easily pinpointed, since the measures affect large groups of people, in and outside the project-area. The direct costs for investing in these measures may be relatively straightforward, amongst others because the developer(s) are identifiable. However, indirect costs and especially benefits will be much harder to identify, because the 'users' of the project are much harder to assess and therewith the direct effects of the project on these users and the indirect effects resulting from it.

External effects (externalities)

Effects of a project that are not included in a financial or economic project evaluation are called external effects or externalities. Besides external effects that can be easily expressed in monetary terms, but which are not, other types of external effects exist that are not easily or cannot be expressed in monetary terms. Examples of this latter category are the consequences of a project for the quality of the (living) environment or nature, and the amenity value of a specific area. As was indicated before, these consequences cannot easily be expressed in monetary terms because for these values no markets and thus no (direct) prices exist. Externalities often concern effects on interest groups that are underrepresented in the decision-making process about projects or policy programs, such as nature, citizens, tax payers, etcetera.

Welfare distribution

It is not a coincidence that the issue of welfare distribution plays an important role with regard to the side effects (externalities) of infra-structural projects on nature and the environment. For individuals representing nature and/or the environment (who are not easily identified in the first place) cannot express their preferences through the economic system (since no prices exist for these externalities). The only way they can do this is through the political-administrative system. The political-administrative solution to the issue of the distribution of welfare is often the (financial) compensation of losing stakeholders ('victims') (Eijgenraam et al., 2000: 46). With the issue of welfare distribution, the limits of a cost-benefit analysis are reached. In the first place, it is impossible to map all distributional effects on an individual level. Secondly, it is impossible to assess the individual valuation – the basis of cost-benefit analysis – of re-distributional impacts. Furthermore, in order to avoid double counting of indirect effects, it is important to separate the effects on the national welfare from all re-distributional effects (Eijgenraam et al., 2000: 44). In most cost-benefit analyses, re-distributional effects are not considered, because the method is concerned with evaluating the (net) effects of a project or program on society as a whole. However, it was already indicated before that the costs of a compensation-scheme should be included in the cost-benefit analysis because they can change its outcome. Since re-distributional impacts are an important aspect of large projects, other ways to address this issue will need to be found. It was already indicated above that the usual way to address this issue is through the political-administrative system. However, it should be explicitly noted in the economic project evaluation that issues of welfare distribution are not addressed through that type of evaluation. Besides, economic analysis can and often does play a major role in assessing the direction and magnitude of re-distributional effects.

Discourse about the role of economic project evaluation

Discourse regarding the scope of economic project evaluation

As was indicated in the introduction to this section, the discourses about the role and content of economic project evaluation are closely interrelated. Whereas the discourse about the content of the economic project evaluation takes place mainly in the scientific arena, the discourse about its role takes place mainly in the political arena. With regard to this role, various stakeholders (or stakeholder coalitions) may have a motive for influencing the political debate. Stakeholders that have an interest in highlighting only direct costs and benefits based on market prices may try to present the economic evaluation as an integrative evaluation. Stakeholders that have an interest in representing the environment, nature or other underrepresented 'stakeholders' may continuously try to put the importance of the outcome of the economic evaluation in perspective. These stakeholders are likely to stress the importance of other tools for project evaluation, such as multi-criteria analysis (MCA) or environmental impact assessment (EIA).

For large public infra-structural projects, the goal with regard to economic project evaluation has evolved over time. Up to the 1960s, economic project evaluations (such as CBA) aimed to calculate the direct costs and benefits of a project for the principal(s) and operators of the project. In the second half of the 20th century, extensive efforts have been made, especially in the USA, to include a wider range of project effects in the evaluation. In recent years, as a pendant of a overall discourse about integrated approaches, the discourse about project evaluation (including economic ones) has focused on methods for integrated evaluation. An integrated evaluation method per se includes and balances all effects of a project. An integrated *economic* project evaluation includes all effects that in principle can be expressed in monetary terms¹⁶⁵. For the execution of an integrated economic evaluation of a large (infra-structural) project, it is important to make clear decisions about which effects will and which effects will not be quantified in monetary terms. Even if all effects that can be expressed in monetary terms are included in an economic project evaluation, this integrated economic project evaluation cannot act as the single integrated evaluation of the project effects, since the situation in which all effects of a large infra-structural project can be expressed in a monetary unit does not exist. Therefore, it should always be made clear which effects are included in an economic evaluation of a project, how the result of this evaluation can be used and how this evaluation relates to other (non-economic) types of project evaluation, such as an EIA or MCA.

Daily (1997) distinguishes three relevant ecological and social aspects regarding the incorporation of the environment in economic evaluations:

- ecological sustainability;
- fair distribution of resources and property rights;
- efficient allocation of resources.

Economic valuation in principle only deals with the last goal of economic efficiency and, according to Daily, as such will not be sufficient in answering the question of which decision or policy is the preferred alternative – such decisions need to be based on all three goals. Furthermore, it is argued that many environmental effects are irreversible; a cost-benefit analysis incorporates benefits of nature that are lost for a certain period of time, while in

¹⁶⁵ For a discussion of 'Total Value' and 'Total Economic Value', see chapter 3.

reality, these benefits may be lost forever (Hanley and Spash, 1993). According to the opponents of economic valuation, it can therefore never guide decision-making in the appropriate directions. Again other groups take an intermediate standpoint. These groups state that through economic valuation, a monetary value is placed on the environment that helps create an awareness of the value of the world's ecosystems (Pearce and Turner, 1990; Costanza et al., 1997). It helps create the '... effectiveness of environmental arguments and thereby influences environmental policy' (Norgaard, 1998).

Discourse about the role and content of economic project evaluation related to the Rivierenland-study

Discourse about the content of economic project evaluation related to the Rivierenland-study

In the introduction to the Rivierenland-study, I discussed a number of specific characteristics of this study in general and the alternative safety concept in particular. The assignment for the cluster 'economic and societal costs and benefits' was to study and compare the effects of the traditional and alternative flood protection-concepts on society. Since the application of the alternative approach would have far going consequences for a substantial part of the country, and over a long period of time, this assignment was interpreted as a study of the extent in which methods for economic evaluation could yield an overview of these economic and societal costs and benefits, considering the scope of the Rivierenland-study in space and time. As we have seen in the analysis of the discourse regarding role and content of methods for economic evaluation in decision-making about public projects and policy, the valuation of effects of initiatives on nature, the value of nature for society and the distribution and calculation of costs and benefits between the present and the future are important aspects in this respect. These aspects will be discussed below for the alternatives studied in the Rivierenland-study.

Externalities of the alternative safety concept

The safety concept presented in the Rivierenland-study is expected to have positive effects on the environment (especially aquatic ecosystems), which in turn results in positive effects on society in the sense of goods and services the environment provides to society. Examples of expected positive effects of the new safety concept on society, either or not via positive effects on aquatic ecosystems, are the reduction of salt intrusion, the generation of strategic fresh water reserves, forgone costs of land subsidence and forgone costs of dredging in harbors. Since the exact magnitude of these effects are (very) hard to predict, these are typically effects that are hard to express in monetary terms and therefore play a subordinate role in economic evaluations (they are listed as PM post or completely left out of the process).

Valuing the inherently larger flexibility, robustness and sustainability of the new safety concept

An important presumed advantage of the new safety concept compared to the traditional one is its presumed larger flexibility and robustness. Flexibility refers to the characteristic that an approach or concept can be adapted to changes in exogenous variables. Exogenous variables in this respect can be of various nature. For example, they can refer to expected physical changes such as changed patterns of precipitation in the river basins due to the greenhouse effect, but they can also refer to possible societal changes, such as changing attitudes towards safety, soil use functions, the man-nature relationship, etcetera. Robustness refers

to the characteristic that a concept functions under different circumstances. As such, robustness and flexibility are complementary characteristics. The fact that these characteristics are attributed to the new safety concept results from the idea that the new safety concept is more dynamic in nature, and therefore more resilient. Whereas in the traditional safety concept, flooding of most land would lead to large damage and maybe even disastrous situations, in the new safety concept, the use functions of the land, the social systems and the mindsets of the inhabitants have been adapted to the possibility of flooding, and the expectation therefore is that a flood will lead to less damage in this approach.

The expectation of a larger sustainability of the new safety concept originates from the thought that certain negative long-term effects of a high degree of human interference in natural systems, as is the case in the traditional safety concept, will be decreased, stopped or even reversed. The question with regard to economic project evaluation is whether these presumed advantageous characteristics of the new safety concept can be expressed in monetary terms. With regard to 'flexibility', the idea is that there are various options to adapt the system to changing circumstances, and that these measures are of a less permanent nature than adaptations according to the traditional approach. Therefore, investments are expected to be smaller, and moreover, they lead to smaller fixed costs. One way to express this advantage in monetary terms, is to compare the expected costs in both approaches that need to be made to adapt to new circumstances, and the costs that need to be made to undo certain measures (which is a measure of the degree to which the costs of adaptations are fixed and thus of capital-destruction in case of undoing these measures).

As was explained above, robustness was interpreted as the capacity to 'absorb' changes in exogenous variables in the system in its present state. The expectation is that the new safety concept will lead to a larger margin (buffer) towards the critical capacity of the system. In the traditional safety approach, the design of the dykes is based on an expected maximum peak discharge of the rivers, which may have to be adjusted time and again due to changing exogenous variables. Since elevation, reinforcement and maintenance of dykes are costly activities, these dykes will not be designed with a large 'overcapacity'. In monetary terms, the robustness of the new safety concept can be expressed as the costs that have to be made according to the traditional safety concept to adapt to changing exogenous circumstances, while the new safety concept would not have to make these costs because of a larger margin (a larger buffer capacity). The inherently larger sustainability of the new safety concept could also be expressed in monetary terms through averted maintenance expenditure. For example, the benefits of halting soil subsidence could be calculated as avoided investments in larger pumping capacity to keep polders dry. The benefits of lower salt intrusion could be expressed in terms of a continued agricultural use with possibly a higher economic value than agricultural practices based on brackish or salty circumstances. The replenishment of fresh groundwater reserves could be expressed in terms of the difference between the costs of preparing drinking water from surface water as compared to preparation from ground water. Lastly, the larger retention capacity of the river basin could be expressed in avoided investments in measures to increase the retention or storage capacity of the river by other means. Although the ways to express the presumed advantages of the new safety concept in terms of flexibility, robustness and sustainability may be imaginable, the practical execution of this line of reasoning may be set with major obstacles. The biggest obstacles will be first to express the magnitude of the effects in

quantitative terms and then to express these quantitative figures in monetary units. Both steps are accompanied by major uncertainties with regard to the prediction of long-term developments related to physical and societal processes. A possible way to deal with these uncertainties would be to develop scenarios and to indicate the band width of these scenarios. However, major margins of uncertainty will always remain. Besides, as was discussed before, the presently common positive discount rate prevents the weighing and comparison of future costs and benefits in economic project evaluations. Besides, a number of positive effects of the alternative safety approach are not valued at all, such as the purifying and retention capacities of aquatic ecosystems.

Discourse about the role of economic project evaluation related to the Rivierenland-study

The tuning of methods for project evaluation for the 'Room for the rivers'-policy

As will be mentioned in the subsection about institutions, it was stipulated in a draft *PKB* regarding the 'room for rivers'-policy that both an EIA and a SCBA should be performed for alternative (sets of) measures within this policy. It was also mentioned that especially regarding the SCBA, no clear guidelines exist with regard to its role and content in the evaluation process. Although hardly any uncertainty exists about the question what type of CBA should be performed for large public projects and policy programs (namely a comprehensive CBA, such as the SCBA), the more uncertainty exists about its role in the process and the content of the tool. Uncertainty about the role and content of the SCBA and its interaction with the EIA has resulted in a debate between actors in various arenas involved in the Room for rivers-policy. This debate addresses various aspects of these evaluation methods, such as the role and content of both the SCBA and the EIA, the degree to which these instruments separately and together cover the effects of proposed alternatives and the way these instruments should be tuned to each other.

Huntjens (2004) studied the interaction between the EIA and the SCBA in the *PKB*-procedure for the 'room for the rivers'-policy. For this purpose, he studied documents related to this policy and the procedure for the implementation of the policy and interviewed a number of key actors involved in the *PKB*-procedure in general and the EIA and SCBA within that procedure in particular. One of the conclusions of the report is that nearly all interviewees share the opinion that the tuning, co-operation and communication between those involved in the EIA-study ('the EIA-makers') and those involved in the SCBA-study ('the SCBA-makers') in general is a painstaking process. According to the report, the main points of discussion are the official role (*taakstelling*) of both instruments and the issue of the valuation of nature.

The role of tools for economic evaluation in the Rivierenland-study

As was mentioned before, for most projects, it will be impossible to quantify all effects, let alone express them in monetary terms. This is even more the case for the alternatives studied in the Rivierenland-study, because of their complexity, the long-term over which the project effects will be felt and the substantial uncertainties about the occurrence and magnitude of certain effects. It is therefore safe to say that a complete integrated economic evaluation of the alternatives is an illusion. Therefore, no method for economic project evaluation, no matter how comprehensive, can serve as an integrated project evaluation of the alternatives studied in the Rivierenland-study. The study performed by the author in the 'economic' cluster of the Rivierenland-study concerned the search for a method for economic

project evaluation that would come closest to meeting the special characteristics and requirements of the *Rivierenland*-study and to consider whether or not this method could be adapted to better meet these special features. As already mentioned before, an important precondition for the application of an economic evaluation method in the *Rivierenland*-study was that the effects of both safety concepts should be studied over a long time horizon. Besides, as the title of the cluster already indicated, the method should allow for an analysis of not only financial costs and benefits, but also societal ones. For this purpose, first an inventory was made of accepted tools for economic, non-economic and combined methods for evaluation of flood protection measures. The reason for including non-economic and combined tools was that these tools might provide insights in how to meet the requirements of the study. One of the conclusions of this inventory was that societal cost-benefit analysis (SCBA) is in principle the most suitable tool for economic evaluation of the effects of the alternatives studied, since in potential it is the most comprehensive (and therefore the most 'integrated') economic evaluation method. The method of SCBA was tested against the preconditions of the *Rivierenland*-study in order to design a SCBA that would meet these preconditions as well as possible. As was mentioned before, discounting plays a crucial role in this respect, since the common practice of discounting in economic project evaluations prevents the weighing of effects on the long-term.

In order to overcome the incompatibility between discounting and weighing effects on the long-term, and to meet other objectives of the study, such as public participation, the concept of a dynamic CBA was introduced. This concept entails a series of SCBAs through time, that would reflect possible changes in society (such as societal preferences, changes in relative scarcity of goods and services, physical changes such as climate change) that are relevant for the choice between various flood protection concepts. The low predictability of the change in value of goods and services that are scarce in present-day society, was already acknowledged in the project as a possible factor influencing economic project evaluation (Ministerie van Verkeer en Waterstaat, 2000b: Bijlage 3: 5). This observation supports an approach like the dynamic CBA. An approach at the overall project level in line with the dynamic CBA was already hinted at in the same report (*idem*). Here, the suggestion was made for an incremental implementation of the new safety concept, with periods of accelerated implementation after shock events. Such an incremental implementation would leave the possibility open to adapt the concept and its implementation process to changing preferences in society and resulting new scarcity-ratios between various products and services.

Summary: levels and arenas of discourse

It was explained in the introduction that the *Rivierenland*-study was a study of a fictitious project representing a radical interpretation of the 'room for the river'-concept. The aim of the study was to generate knowledge of and insights in the necessity for and consequences of applying such a radical interpretation to a certain area. Because of a general lack of knowledge about necessity and consequences, the strategy was to first study these aspects in a confined number of arenas. These arenas, as discussed before, were the administrative arena related to water management, mainly at the national level, and the 'knowledge arena' of universities, (semi-) governmental institutes and consultancies.

When looking at the broader interpretation of the policy-making process as presented in chapter 2 (section 2.7.8), a distinction must be made between the levels of normative discourse identified earlier in this section. The discourses at the first (water quantity management in general) and second (flood protection management) level can be said to take place in several arenas (the 'knowledge', societal, political and administrative arenas) and in several stages of the policy-making process (goal setting, policy approach, design and implementation and monitoring and evaluation). As was indicated before, this is not the case for the third level of normative discourse and the strategic discourse (the Rivierenland-study as a whole and the role and content of tools for economic evaluation in it, respectively). For the level of strategic discourse, it can even be argued that the discourse is largely limited to the knowledge arena (which in this case includes specialists in the arena of public administration, scientists and consultancies and research institutes), because of the major difficulties of applying methods for economic evaluation for the specific purpose of the study. This specific purpose entails the *comprehensive* description and analysis of the type and magnitude of the (economic) effects of the alternative approaches considered, on a *large scale* and over a *long time interval*. This description and analysis brings along major uncertainties and methodical difficulties, which to a considerable extent limit the usefulness of the tool under consideration (the SCBA). The discussion showed that no consensus exists yet about both the content and role of economic evaluation methods (in short the strategic discourse) in the analysis of the presented alternative safety strategies. As a consequence, no institutionalisation of these methods has taken place yet, which in turn allows for continued debate about (and thus questioning of) this role and content. This situation is different for EIAs, which have already been standardised (and thus institutionalised) to some extent, especially with regard to the process of performing an EIA and to some extent also with regard to its content and role.

ACTORS, MOTIVES, RESOURCES AND POWER

Since the Rivierenland-study regarded the study of a fictitious project, no study could be made of the stakeholders in the societal arena affected by the alternative safety approach and the power and resources they could use to influence the decision-making process about this approach. The material on these dimensions of the policy arrangement is therefore limited. Instead, in the current stage of the development of the alternative safety concept, the debate about the concept mainly takes place in the administrative and scientific arenas. Therefore, the policy arrangement regarding flood protection was analysed from that perspective. Since the focus in this case was on the dimension of discourse (in the administrative and scientific arena), empirical data for the other dimensions are limited as well. Therefore, 'actors and motives' and 'power and resources' are described jointly in this subsection.

In principle, the role of methods for economic project evaluation is confined to one: providing information about the economic consequences of a project. What this role means in reality depends on the actors involved. Vice versa, what view actors have on the role of the economic evaluation and the meaning of its outcome may also depend on the outcome itself. If this outcome reflects the interest of actors, they may try to stress the importance of economic evaluation relative to other types of project evaluation. The outcome of the economic evaluation in turn depends on its content. Therefore, actors may have an interest

in influencing the content as well. In case no guidelines exist with regard to the role and content of the economic evaluations, opportunities to manipulate both content and role are larger than in case these guidelines do exist. On the other hand, if guidelines do exist, tools for economic evaluations may be biased towards serving the interests of one (group of) actor(s) better than another groups's interests. These guidelines then constitute an important institution legitimising the selection between primary and secondary stakeholders. For the reasons just discussed, it is important to identify and analyse the actors involved in the debate, their interests and influence, and the role of existing institutions regarding the policy process. These dimensions will be discussed in the remainder of this section in the order mentioned, starting with actors right below.

Primary and secondary stakeholders

Primary stakeholders in the Rivierenland-study

At the first and second levels of normative discourse (regarding 'room for water' - and 'room for the river' -policy, respectively), the range of actors involved in the process of policy formulation and implementation is substantial. A major reason for this is that these processes of policy formulation and implementation are actually taking place. Therefore, actors from all arenas (the scientific, administrative, political and societal) are to some degree involved. This is different for the Rivierenland-study, which constitutes the third level of normative discourse. This study addresses a fictitious project with major impacts on communities in the area under study. Because of these major impacts, the idea was to introduce the concept in a careful manner. In order not to 'blow up' the concept in an early stage of its introduction (introducing the concept on a large scale, in several arenas and as a consequence risking massive protests precluding further introduction), the number of actors involved in this initial stage of the introduction of the concept (the Rivierenland-study as performed in 2000 and 2001) was deliberately limited. The actors involved in the study originated from semi-governmental knowledge providers (universities, KIT), the administrative domain (mainly DWW, but also other governmental knowledge institutions, such as the Bouwdienst, which is also a (former) institutions of the ministry of Transport, Public Works and Water management) and private knowledge providers (large consultancies such as NEI, Alterra and Delft Hydraulics for expert knowledge, and a consultancy for process management). Occasionally, usually at the presentation of (intermediary) results, representatives of the political arena were involved. These representatives, however, were limited to those related to the ministry, and no full scale debate in the political arena took place.

The same types of actors as involved in the Rivierenland-study as a whole were involved in studying the economic and societal costs and benefits of the fictitious project. In this level of discourse (strategic discourse about tools for economic project evaluation in the Rivierenland-study), two primary stakeholders can be distinguished: the principal and contracting parties. The principal is the *Dienst Weg- en Waterbouw (DWW)* of the Ministry of Transport, Public Works and Water Management (*Ministerie van V&W*). The contracting parties were Erasmus center for Sustainability and Management (ESM) and NEI. In the explorative stage the Rivierenland-study was in, the results of the studies in the various clusters would not have direct consequences for policymaking. Therefore, the procedures followed for these studies

did not have a formal status. This meant that no steering committee or peer review group was appointed to advise during the process, to monitor it or to scrutinise the results.

Secondary stakeholders

Indirect stakeholders of the study would be those actors that would be positively or negatively affected by actual execution of one of the safety concepts. Indirect stakeholders that may be positively affected by the new concept are 'nature' itself (represented for example nature organisations and ecological scientists) and those that benefit from healthy aquatic ecosystems (society as a whole, recreational actors, fresh water fisheries, consumers of drinking water), inhabitants of flood prone areas outside the study-area, mining companies, scientific and consultancy groups that advocate an ecosystems approach to water management, and businesses that see opportunities in the new concept, for example in the housing sector. These actors can be indicated as supporters of the new concept, and therefore opponents of the existing flood defence policy and the institutions that resulted from this policy. Since the traditional approach is taken as a starting point, these actors are indicated as 'opponents'. Indirect stakeholders that may be or may feel negatively affected by the alternative approach are inhabitants of the study area, owners of land and/or real estate capital, water transport companies and their supply and demand chains, municipalities that feel their opportunities are limited through this approach and contractors of traditional (civil engineering) artificial flood protection approaches. These actors are expected to oppose to the new safety concept, and therefore to support the traditional artificial flood protection policy and the institutions that have resulted from this approach. These actors are therefore indicated as 'supporters'. In the exploratory phase of the Rivierenland-study, the Rivierenland-project was considered to be too abstract to involve inhabitants of the study area and other secondary stakeholders. Therefore, the indirect stakeholders likely to be affected by the project did not contribute to the discourse about the development of the new safety concept in this phase.

Stakeholder motives and interests

With regard to the motives and interests of stakeholders, the categorisation in primary and secondary stakeholders is based on the third level of normative discourse and the strategic discourse, equal to the passage above.

Primary stakeholders

Within the Rivierenland-study, two main types of stakeholders can be distinguished: the principal and the contracting parties.

The principal

The official aim of the Rivierenland-study was to expand the scientific data-base with regard to the potential effects of the new safety approach. However, the principal of the study (DWW) probably also had an interest in executing the study to obtain scientific legitimacy for the alternative safety concept. Scientific legitimacy can be seen as an important resource to substantiate claims made with regard to the new concept. The interesting thing of the Rivierenland-study is that it was initiated by a staff service of the Ministry of Transport, Public Works and Water Management itself. This initiative is likely to be the result of various pressures in the context of policymaking. Another interest of the principal was to carefully introduce the new safety concept by 'warming up' a limited number of arenas. Underlying

motives for the new safety concept may be of various nature, such as deregulation and delegation of authority, responsibility but most of all liability for flood protection to lower public authorities and private parties. Besides, ideological views may have played a role. However, this was not analysed extensively.

The contracting parties

Various contracting parties played a role in generating scientific information for the Rivierenland-study. These contracting parties may have had several motives for participating in the study. An obvious one is to get paid for the services provided. This motive, however, was only relevant for a number of contracting parties. Most contracting parties (the majority of the contracting parties were universities) participated voluntarily, in order to provide students the opportunity to do research. This research may result in scientific output enhancing the position of the contracting party within its university and in the scientific community at large. Another motive may be the strategy to obtain a structural relationship with the principal in order to increase the chance of research contracts in the future.

Secondary stakeholders

The number of potential secondary stakeholders of the Rivierenland-study is large. This group however was not addressed in the course of the study. For some (especially secondary) stakeholders it is hard to predict what their position in the discourse will be. This position to a large extent depends on their interests in the discourse. These interests can relate to two dimensions: the paradigmatic attitude of the stakeholder towards river (flood) management and any practical (opportunistic) interests in river flood management. Both the paradigmatic and risk attitude and practical considerations will for example determine whether riparian municipalities see the new concept as an opportunity or a threat. Another factor that will influence the attitude of stakeholders are the intentions of the principal with regard to introducing a new safety concept and the way this concept is presented. Since this was acknowledged by the principal, a consultancy bureau was hired to coach the project team with regard to a cautious and strategic introduction (communication) of the new policy concept.

Resources and power

Resources and power in the second level of discourse

Opponents of the traditional approach

Since the new safety concept has been introduced very recently, not much information exists on its scoring potential with regard to selection criteria for policy. Advocates of the new approach will look for arguments that support the new concept (discourse). They will try to emphasise the importance of the negative external effects of the traditional approach and the positive ones of the new approach in communication with other actors. Important resources for advocates of the new approach in this respect (their story line in the discourse) are developments in national and EU-policy towards policy concepts and approaches such as the water systems approach, river (sub-)basin management, eco-pragmatism, nature-restoration and healthy and resilient aquatic ecosystems.

Resources and power in the strategic discourse

Because of a general lack of guidelines about content, scope and role of tools for economic evaluation of projects and policy in water management, these methods are being used as a resource in the larger discourse about policy approaches in water management. An important resource of power for advocates of the traditional approach to flood protection in this respect is the existing institutional framework. With regard to economic policy evaluation, for decades, only direct costs and benefits water works were included in cost-benefit analysis, such as costs of building the construction, hiring expertise and operating costs. Direct benefits included prevented flood damage, benefits from selling generated hydro-power in case of dams, etc. Negative external effects to society, in the form of ecosystem damage, salinisation at the mouth of rivers due to reduced quantities of water in the river and reduced fish yields hardly played a role. Therefore, the cost-benefit balance of activities in the traditional approach could be overestimated. This was in the interest of primary stakeholders in the traditional approach to flood protection, such as contractors and sub-contractors for artificial constructions in the 'wet' construction sector. For an extensive discussion of the strategic use of methods for the economic valuation of nature by actors involved in water related issues, I refer to Schuijt (2003).

INSTITUTIONS REGARDING THE ROLE AND CONTENT OF TOOLS FOR ECONOMIC EVALUATION

Earlier in this section, it was already indicated that the discourse regarding the 'room for rivers'-approach is relatively new, and therefore has not been institutionalised as well as the 'stemming the water' approach. However, as will follow from this subsection, some rules regarding the new approach are being designed or are already in place. These include both formal and informal institutions. Rules regarding the room for rivers-approach mainly relate to the design of the decision-making process regarding measures that fit the new approach. These rules will be laid down in the *PKB 'Ruimte voor de rivier'*. The rules address issues such as the primary stakeholders of the process, the interaction between these stakeholders, moments in the process in which secondary stakeholders should be informed and/or consulted, the types of instruments that need to be used for the evaluation of alternative (sets of) measures, etc.

As was mentioned before, in this *PKB*, it was stipulated that both a SCBA (Social Cost-Benefit Analysis) and an EIA (Environmental Impact Assessment) needed to be undertaken. However, no (clear) stipulations were laid down in the *PKB* as to how the SCBA and EIA should be performed. The EIA is obligatory for large spatial planning projects (usually at the national level) that exceed a certain budget. In the last decade, a considerable number of EIAs has been performed and the scope and content of this instrument have been standardised to a considerable degree. This is much less the case for SCBAs. Cost-benefit analyses have been performed for infra-structural projects for decades, but their scope and content have changed substantially in the past few years. In order to play a role in the comprehensive evaluation of projects and policy programs, its scope has been expanded to include (economic valuations of) effects that were formerly left out of the CBA. This comprehensive CBA is often referred to as a SCBA (social or societal cost benefit analysis). So far, only a limited number of rules and guidelines was issued about the role and content of SCBAs in project evaluation.

Formal institutions

Political rules

As was mentioned above, some rules, including political ones, are already in place to facilitate the 'room for rivers'-approach. The most important of these rules is the *Planologische KernBeslissing (PKB) 'Ruimte voor de rivier'* (room for rivers)¹⁶⁶. The PKB-procedure was announced in 2000 in the cabinet-position about safety and water nuisance related to the major rivers. It shapes the conditions for a series of measures in the flood plains of the major rivers to increase their storage and discharge capacity in a horizontal direction. The PKB-procedure for the major rivers is part of the new water policy (which can be summarised as 'room for water'), which was laid down in the cabinet position *Anders omgaan met water* ('dealing with water differently') (Ministerie van Verkeer en Waterstaat, 2000) and de *Startovereenkomst waterbeleid 21e eeuw* (declaration of intent for water management in the 21st century) (Ministerie van Verkeer en Waterstaat et al., 2001). This new policy consists of three 'tracks'. The first track entails setting up an organisation and making procedural agreements. The second track entails 'anchoring' the new policy in national policy and policy visions of other (read: lower) governmental organisations. Besides, in this track, (sets of) instruments will be developed and their implementation will be prepared. The third track entails the actual putting into order of the primary water system and the regional (secondary and tertiary) systems. In study programs addressing the primary water system¹⁶⁷, it is stipulated that a new direction should be taken for the management of the major rivers, in which there is a strong preference for more room for the rivers. The construction of a PKB consists of a number of official phases, in which all parties (including ministries, legal advisors, provinces, municipalities, citizens, interest organisations and business) will get the opportunity to express their interests and demands/wishes. In total, the PKB will consist of four parts, the first of which will be issued halfway 2004. After public consultation and administrative meetings, part four will be concluded in 2005.

The *PKB Ruimte voor de rivier* followed another PKB, namely the *PKB Deltaplan grote rivieren*. This PKB enabled quick and large scale dyke-reinforcements after the near-floods of 1993 and 1995. The *PKB Deltaplan grote rivieren* can be considered an emergency procedure that enabled short term action to enhance the (feeling of) safety of inhabitants of the floodplains of the major rivers and of adjacent areas. The pressing sense of urgency for flood protection measures that resulted from these near floods made it possible to install such an emergency institution and perform the measures suggested in it. At the same time, however, a need was expressed to address the issue of river floods (and water quantity issues in general) in a more structural way. The *PKB Ruimte voor de rivier* can be considered as the concrete result of this new policy for the flood plains of the major rivers in The Netherlands.

In 2000 a project-organisation was erected and assigned with the task of preparing the *PKB*¹⁶⁸. As part of this PKB, in 2002, a *Startnotitie MER* (starting document EIA) was

¹⁶⁶ See for example www.ruimtevoorderivier.nl

¹⁶⁷ Such as *Ruimte voor de rivier* (see <http://www.ruimtevoorderivier.nl/>) and *Spankrachtstudie* (see http://www.riza.nl/publicaties/riza_rapporten/spankracht_rivierenland.html)

¹⁶⁸ See www.ruimtevoorderivier.nl

published, which includes the starting points, the goal(s), conditions and other important aspects of the EIA study. After publication of the starting document a public hearing was held. The reactions of the public hearing were gathered in a report and presented to the EIA-commission (*Commissie m.e.r.*; a commission that was installed by the central government to act as an objective reviewing commission of (draft) EIA-studies for public projects). The advice provided by the commission was laid down in the *rapport richtlijnen MER* (report with guidelines for the EIA). In the second phase of the EIA-procedure, research is done with regard to the alternative measures that can be taken to effectuate the room for rivers-policy and the effects these measures may have on the environment and on the socio-economic aspects of society. The *rapport richtlijnen MER* stipulated that for this purpose, an EIA and a SCBA (respectively) should be performed. The results of these studies will be laid down in two reports: the EIA-report and the SCBA-report. These reports will be tested by the responsible ministries, after which Part 1 of the *PKB* will be published. In Part 1, which is the draft *PKB*, the cabinet will present the policy resolutions with regard to the spatial planning of the flood plains of the major rivers based on the general goals of the 'Room for the rivers'-policy (Huntjens, 2004: 8 a.f.).

Economic rules

Guidelines and standardisation

An important step in the acceptance and institutionalisation of social cost-benefit analysis as the official economic (or even integrated) evaluation method for large infra-structural projects was the publication in 2000 of a report by NEI¹⁶⁹ and CPB¹⁷⁰ within the framework of the 'OEEI'-study¹⁷¹ (Eijgenraam et al., 2000). The goal of the study was to come up with a guideline for the economic evaluation of (large) public projects for infrastructure. This report recommends the application of a social cost-benefit analysis (SCBA) as an evaluation of government investments for large infra-structural projects in the 'dry' sector. According to the authors, social cost-benefit analysis evaluates costs and benefits of actions from the point of view of society, which may incorporate external effects. The *OEEI*-report stipulates the process and content of the SCBA for large public infra-structural projects. The principals of the research program that resulted in the guideline were the ministries of Transport, Public Works and Water management and Economic Affairs. These ministries adopted the guideline in 2000 for testing in practice.

Since then, the guidance report seems to have been accepted by the national government, or at least a number of recommendations in the report have been adopted. For example, the official position of the cabinet with regard to the discount rate of economic evaluations of project investments and effects was adopted from this report, which advised a rate of 4%. As was discussed before, discounting plays an important role in all investments in physical infrastructure. Usually, the discount factor is based on the expected return on investment of the project. Estimations of the real rate of return on investment vary, but usually lie between 4 and 10% for developed countries (Nordhaus, 1991). The World Bank usually does not

¹⁶⁹ *NEI (Nederlands Economisch Instituut)* is the Dutch Economic Institute. The name of the institute has been changed into Ecorys.

¹⁷⁰ *CPB (Centraal PlanBureau)* is the Central Planning Bureau.

¹⁷¹ *OEEI* stands for *Onderzoeksprogramma Economische Effecten van Infrastructuur* (research programme for the assessment of economic effects of infra-structure)

accept projects with an expected return on investment of less than 10% (Markandya and Pierce, 1991: 140). The discount rate of 4% as adopted by the central government is therefore on the low side of the range.

With regard to the evaluation of wet infra-structural projects, no dominant discourse seems to exist yet, and therefore no stable policy arrangement is in place. So far, only a limited number of rules has been introduced at national level in order to some extent guide the evaluation of large infra-structural projects. An example is the legal requirement to perform an EIA for large infra-structural projects. With regard to the economic evaluation of large public infra-structural projects in the wet sector, no guideline exists yet, neither with regard to role nor content. A similar guideline as the OEEI-guideline for large (public) projects for wet infra-structure would provide substantial clarity about the position of the national government towards the content and role of economic project evaluations for these types of projects. It can be expected that a future guideline for the 'wet sector' will not differ substantially from the one in the dry sector. Therefore, the discount rate for the evaluation of public projects of 4% as adopted by the central government will in time probably be adopted for wet infrastructure as well.

In 2003, RIZA published a report which was intended as a first initiative to construct a guideline for integrated economic policy evaluations in the wet sector, similar to the OEEI-guideline for dry infrastructure (see Brouwer et al., 2003). An interesting aspect of this report is that it is presented as a guideline for integrated policy evaluations, whereas the method used for these evaluations is economic in nature. The study discusses methods for the assessment and valuation of effects of policy measures for water management from three perspectives: the economic, ecological and socio-cultural perspective. Although potentially integrative in terms of the scope of effects included in the study, the study does not question the neo-classical starting points of economic evaluation, and as a consequence is as integrative as possible within the limits of this school of economic thought.

The same counts for other reports addressing the possibilities of integrated economic project evaluation in Dutch water management (see for example Kind, 2002; CPB (2000)). One of the observations with regard to these studies is that the discount factor of 4% is never questioned. On the other hand, most studies do explicitly acknowledge the fact that in the current state of art, economic evaluation does never cover the full range of effects and that the valuation of effects via methods other than the market price are often accompanied by substantial uncertainties. However, in general, these studies do not explicitly attempt to adapt the starting points of economic evaluation methods according to the acknowledgement of these uncertainties. This denial of the fundamental discussions can be explained by two main factors: first of all, the studies mentioned were performed by government institutes that were erected mainly to perform studies directed at the support of political and administrative decision-making. The studies of these institutions therefore usually generate results that are directly relevant to politics and public administration. This can be seen as a result of the trend towards scientification, in which only hard data (i.e. numbers and figures) count. As a consequence, only accepted institutions for economic valuation, such as market prices, are included in these evaluations. Secondly, this behavior may be explained by the dominant trends in (especially) western societies towards 'rationalisation' and 'economisation'. Rationalisation can be defined as the 'a desire for and tendency towards the

reduction of risks in society which is strived for by means of calculation and quantitative analysis'. 'Economisation' is the exponent of this tendency which aims to reduce risks by describing phenomena, activities and their effects in monetary terms'. Both trends have led to an increased interest in economic methods and instruments for policymaking. At the same time, there is a tendency in society (including economics) towards integrative analyses of phenomena, activities and their effects. The combination of these trends leads to a tendency to broaden the scope of economic policy evaluation as far as possible, within the limits of traditional economic thought.

As discussed before, the consequence of the positive discount factor as accepted in most studies is that long-term effects do not weigh equal to short term effects in the economic evaluation of projects. Since it is the explicit goal of the Rivierenland-study to make an inventory of costs and benefits of both flood protection strategies over a long time span, the issue of discounting is, compared to 'regular' project evaluations, even more important. Another factor that contributes to this crucial position is the expectation that in the alternative safety concept, investments (project costs) will be substantial in the short term, and benefits will only occur in the (very) long-term. For the traditional flood protection strategy, the infrastructure is already in place, so no large investments will be needed in the short term and costs and benefits of this strategy will be (more) evenly spread over time. A positive discount factor therefore seems to put the new safety concept in a disadvantageous position. Under the 4% rule, the economic evaluation of the alternatives of the Rivierenland-study would be no use, since studying the effects of both alternatives over a long-term would lose its meaning.

Informal institutions

Scientific and policy paradigms

With regard to policy paradigms, a shift can be observed in Dutch water policy from modernist paradigms to the man-nature relationship, such as environmental protection, towards post-modern paradigms, such as resource management and eco-development. Because of path dependency in various parts of the administrative, political, scientific and societal arena, however, these 'post-modern' policy resolutions are not yet institutionalised in the policy methods and instruments in water management. Various factors may account for this, such as change averse (and thus risk averse) behavior, habit, political opportunism and indifference. This phenomenon can also be observed with regard to the role of economic methods for project evaluation. Although, as a result of these post-modern pressures, the scope of these methods has expanded in recent years, this has taken place within the boundaries of traditional neo-classical thought. This development also resembles characteristics of the trend towards ecological modernisation.

Informal institutions regarding the role and content of economic tools for project evaluation

The discourse about the role of economic project evaluation in the Rivierenland-study is a special one because of the study's precondition to study the effects of the alternative safety concepts in the long-term. In the section addressing the discourse about the role and content of methods for economic project evaluation, it was already observed that most methods used for this purpose are based on neo-classical economic assumptions. Therefore, a precedent or 'path-dependency' with regard to economic evaluation of public projects has

been created. This tendency is likely to marginalise the role of economic project evaluation in the Rivierenland-study, since it cannot meet the central pre-condition of the study.

5.5.6 CONCLUSIONS ABOUT THE ECONOMIC EVALUATION OF PUBLIC INITIATIVES IN FLOOD PROTECTION

From the description of the discourse about river flood protection, two main conclusions can be drawn. The first is that established economic authorities (NEI/CPB) have a large influence on decision-making processes about large infra-structural projects via the institutionalisation of their recommendations for economic project evaluation. These institutions predominantly apply neo-classical approaches to economic project evaluation. The starting points of this school of economic hardly seem to be questioned by the present primary actors in flood protection, not even in the light of integrated or sustainable water management.

The second conclusion, and in line with the first, is that CBA according to the official guidelines of the national government for large infra-structural effects is biased against sustainable solutions as defined by the OECD. This definition includes societal, environmental and economic considerations. A SCBA according to the conditions set out in the official national guideline can only play a role in the assessment of the economic feasibility of public projects in terms of proper investment of available public financial resources. The method's contribution to assessing the best investment of public financial resources over long periods of time is questionable and still a matter of (mainly scientific and administrative) debate. The guidelines as adopted by the cabinet bias against alternatives that require investments in the short run and are expected to yield benefits in the long run, as is the case with the alternative, new safety concept according to the room for rivers concept as studied in the Rivierenland-study.

In making decisions about sustainable investments of public resources on a long-term, other than economic considerations, such as social and environmental ones, also need to play a role. As long as these considerations are not an equal part of an 'integrated' economic evaluation method, multi-criteria analysis seems to be the most comprehensive and therefore most suitable evaluation method in this respect. The role of SCBA is limited to the economic dimension by making an as comprehensive as possible evaluation of the economic effects of project alternatives. It must be kept in mind that this economic evaluation, especially when performed under the preconditions generally agreed by the central government, only expresses part of the Total Economic Value (let alone the Total Value) of activities, goods and services (including those of ecosystems) involved in monetary terms.

The lack of clear guidelines for evaluation methods, especially regarding the SCBA, has resulted in a heavy debate between actors in various arenas about the roles of the SCBA and EIA, their content and the interaction between these instruments. So far, no clear dominant discourse has emerged from this debate. Whereas the process that leads to measures within the policy of 'room for rivers' has to a considerable extent been laid down in rules (in the *PKB*), this is much less the case for the role and content of evaluation methods used in this process.

5.6 SUMMARY

5.6.1 ISSUES AND APPROACHES

The discussion of issues in water systems quantity management at the start of this chapter showed that a number of these issues are the consequence of sectoral surface water management aimed at meeting the needs of a limited number of specific economic interests (such as agriculture and water transport). These issues are desiccation, salinisation, subsidence, water nuisance and water quality problems as a result of (too) effective drainage and excessive pumping. Most issues in water systems quantity management are dealt with by planning instruments and command-and-control instruments. Economic approaches seem to play a marginal role in policy for water quantity management. For the financing of the water quantity management tasks of public water organisations (water boards and Rijkswaterstaat), task related levies (benefit or cost-cause principle) and general taxes are used. These instruments are not intended as regulative instruments based on the market mechanism. Therefore, they are not regarded as (true) environmental economic policy instruments.

Yet, a number of (new) economic instruments is being studied or applied in water quantity management. Some of these economic instruments fall under the category of traditional, centralistic environmental economic instruments, other instruments fall under the category of decentralised case-specific contracts between public water managers and private parties providing water management services. With regard to desiccation, some structural measures have been taken, making use of different types of policy instruments, such as ground water extraction taxes, public-private partnerships with regard to surface water management and regulations to restrict ground water extraction and establish a shift from the use of ground water to the use of surface water for various purposes. As a result, desiccation caused by ground water extraction has reduced. Other issues created by traditional sectoral water management, such as salinisation and subsidence, are more pervasive in nature and would need more radical shifts in approach to be addressed effectively. The question is whether society is prepared to make this shift. With regard to the issue of water nuisance, a dominant normative discourse has emerged in recent years that aims to address this issue through a spatial approach. This discourse favours regional or local arrangements directed at taking spatial supply measures to centralistic demand management measures. These spatial supply management measures may also address the issue of deteriorating water quality due to the inlet of 'non-area-specific' water.

5.6.2 CENTRALISTIC ECONOMIC STEERING INSTRUMENTS

GROUND WATER TAX

Ground water abstraction taxes with a fiscal function have been installed at regional level (*deelstaten*) in Germany and at national level in Denmark and The Netherlands. While the rate of the Dutch tax is relatively low, it does not exempt industry. The Danish tax is quite high, but applies to households and some service business only. Both taxes exempt agriculture, and in that way indirectly subsidise it. The ground water extraction charge is the

main centralistic economic instrument for water quantity management in The Netherlands. This charge was introduced with the purpose of reducing and regulating ground water extraction by private actors. The reduction of ground water extraction served two goals: building a strategic ground water reserve as resource for drinking water preparation and reducing the effect of groundwater extraction on desiccation (by limiting its use for inferior purposes) (ECOTEC et al., 1999). A remarkable thing is that The Netherlands were the only EU or EEA-country in 1996 to have installed a ground water extraction tax. The tax is part of the Environmental taxes act aimed at greening the tax system, and thus also serves a revenue raising purpose.

SURFACE WATER TAX

Contrary to a number of other EU-member states (such as France and Spain), The Netherlands have not introduced a surface water extraction tax. The analysis of the discourse about this instrument yielded a number of factors explaining this. A first factor is that a surface water extraction tax would counteract the shift from using ground water to using surface water for various purposes, such as drinking water preparation. As such, such a tax would thwart the policy to fight desiccation. Another reason for this may be the perceived abundance of surface water in The Netherlands. Droughts in recent summers have however made clear that The Netherlands are to a very large degree dependent on supply of fresh surface water from abroad. One of the reasons for this dependency, according to the commission for water management in the 21st century, is the fact that the whole water management structure in The Netherlands is aimed at discharging 'superfluous' fresh water as fast as possible. In order to make water users aware of the scarcity of surface water in dry periods, the debate about a surface water extraction tax has recently been carefully reopened. However, because of the perceived abundance and the appropriated (informal) use rights, such a tax may not be easily accepted by economic actors using surface water. Besides, the dominant normative discourse regarding water quantity aims at supply management instead of demand management.

5.6.3 SHIFT FROM TECHNOCRATIC TO SPATIAL APPROACHES

In water quantity management, both with regard to excess and shortage of water, a debate is going on about the choice between technocratic approaches ('stemming and controlling water') and spatial approaches ('accommodating water'). At present, this debate seems to have been won by spatial approaches. The spatial approach in water quantity management is the dominant normative discourse for both the local/regional (secondary and tertiary systems) and the national level (primary system). At the local/regional level, giving room to water is to create possibilities for retention and storage, serving two goals: decreasing peak flows and nuisance downstream in periods of water excess, and building reserves for periods of water shortage. Because of the scarcity of space in The Netherlands, the aim is to combine these spatial approaches to water management with other land use functions. A similar approach is envisaged for the protection against flooding by rivers (room for rivers). By giving more room to rivers and at the same time paying attention to the 'design' of the flood plain, safety measures are combined with creating possibilities for nature development and 'spatial quality'. These nature areas cannot only serve as recreational areas, but can also

provide for other products and services, such as fish, wood, purification and retention of water, reed, etc. As showed from the discussion of these spatial approaches, multiple land use planning is an important concept for its legitimisation.

An obstacle for this shift in discourse is the fact that the traditional approach is well institutionalised (developed), while the new approach is not, and therefore (amongst other things) still needs to develop a proper institutional framework, including policy instruments and evaluation methods. This is likely to be a long-term process, including many obstacles. At the same time, it must be noted that spatial approaches for some part are feasible because a well developed technocratic system is already in place. This technocratic system acts as a back-up, or framework, within which spatial approaches are applied. The reason that this technocratic back-up is needed is the risk attitude of society (showing decreasing risk tolerance), including that towards river floods and local water nuisance.

From the analysis of arrangements in this discourse, it can be concluded that it will be easier to apply the spatial approach at the national level (room for the river) than at the regional/local level. At the national level, these measures can, to a certain degree, be enforced because of the 'general interest' of flood protection and reducing the flood risk. Enforcing this approach is done via the spatial planning instrument of the *PKB*. This instrument enables the central government to appoint areas for spatial water management measures via a so called diagonal arrangement. Since at the local/regional level, the situation is less life-threatening, no such top-down instrument can be applied. Therefore, room for water has to be ensured via the regular spatial planning procedures, in which water is one of many aspects of spatial planning playing a role in spatial planning. At present, no instruments exist for regional water managers to enforce spatial water measures. Therefore, at this level, voluntary agreements will have to be struck with landowners. Blue service-arrangements and PPP-arrangements are examples of such voluntary agreements.

5.6.4 SPATIAL APPROACHES TO WATER QUANTITY MANAGEMENT

As was shown in this chapter, a vast number of studies have recently been performed about the policy, organisation and financing for water systems quantity management. This attention for water systems quantity management originates from the near floods in 1993 and 1995, the local water nuisance due to heavy precipitation and the water shortage due to droughts in more recent years. These events showed the vulnerability and fallibility of the present water management system. These shock events lead to an impulse in policy for water systems quantity management and somewhat drew attention away from water systems quality management¹⁷². The commission that studied the desired water (quantity) management system for the 21st century (*Commissie Tielrooy*) played an important role in defining policy concepts and principles for the future. The recommendations of this commission were to a large part adopted by the cabinet and the parliament and are therefore official policy now. The main recommendation of the commission is the priority order for water quantity management 'retention, storage, discharge'. This priority order aims at reducing peak burdens on sewer systems and local, regional and national surface water

¹⁷² It must be noted that the pathway towards implementation of the EU WFD has ensured that attention for water (systems) quality management has received a new impulse.

systems in times of excess water supply, and at building water reserves for periods of water shortage due to low water supply (either from precipitation or inflow from abroad). The approach in water quantity management according to the tryptich 'retention, storage, discharge' can be typified as supply management.

The policy instruments developed to effectuate this new 'room for water' policy are mainly regulations that (are to) ensure the position of water in spatial plans at the provincial and municipal level. At the same time, however, there is a search for other instruments that can increase (cost-) effectiveness in water quantity management. Mostly, these new types of instruments are based on voluntary agreements between water managers and private parties (mainly landowners). The main types of arrangements suggested are blue services and public private partnerships (PPP). The potential for economic approaches within this approach to water quantity management was also recognised by the *Commissie Togtema*, which studied the structure for financing management tasks of water boards. Water management via private contracting already existed in relation to fighting desiccation and for agricultural nature management (rewarding landowners (mostly farmers) for agricultural nature management and/or compensation for reduced yield because of higher ground water tables). These arrangements are referred to as 'green services'. As a result of the attention for water nuisance and the risk of flooding, this construction is now also proposed for retention and storage measures (blue services). For example, policy has been adopted to compensate the increase of hard surface with increased storage capacity in new spatial development projects. For these projects, often public-private partnerships are erected. Within the framework of these PPPs, public facilities, including water quantity goals, can be (partly) financed via the profit margin on private land use function (often real estate).

In this chapter, the opportunities and threats, impulses and obstacles for arrangements involving incomplete contracts were discussed. It was noted that there is a fundamental difference between blue services and PPP-arrangements with regard to the distribution of property rights. Blue service-arrangements are arrangements in which existing land use functions are combined with water management measures. Since the designated land use function (based on the municipal zoning plan) of the land on which use functions are combined is maintained, the owners and users of the land have certain rights with regard to its use. In case the planned water management measure interferes with this right, the landowner or user has a right to be compensated for damage. In PPP-arrangements for new spatial development projects, new land use functions are assigned in the zoning plan. With the change in land use functions, property rights are likely to be transferred between actors. Public authorities can use this transfer of property rights to attach specific demands to these property rights regarding the development and use of the area involved. As such, the development of an area involving changes in the zoning plan offers better opportunities for realising public facilities (including measures for water management) than the case in which the original land use function remains in tact and is combined with water management measures. This change in property rights is also more likely to change the paradigmatic view of actors involved about the way to 'treat' water. Whereas in case of blue services and PPP-arrangements for water management activities, no fundamental change in the normative discourse occurs ('water as a condition' is still the starting point for determining who compensates who), in PPP-arrangements involving new land use functions, private actors

can be made to co-finance water management measures, and water is regarded more as a land use function of its own, treating it according to the discourse 'water as a service'.

5.6.5 DIFFERENCES BETWEEN CENTRALISTIC INSTRUMENTS AND MEASURES IN THE 'ROOM FOR WATER' APPROACH

A fundamental difference in approach also exists between centralistic economic steering instruments for water quantity management and instruments applied within the 'room for water' approach. This difference is that centralistic instruments are (usually) directed at influencing demand for water (i.e. limiting use), while the measures proposed or applied within the 'room for water' approach are directed at enhancing supply. As was argued with regard to the difference between blue services and PPP-arrangements for spatial developments, the type of policy approach applied, and the instruments in it, strongly interact with the normative discourse about water management and the man-nature paradigms lying at the basis of this discourse. Whereas centralistic steering instruments (such as ground water or surface water extraction taxes) per definition change property rights of actors affected, this is not automatically the case with measures for supply management. As was demonstrated above, this depends on whether existing land use functions (and connected property rights) remain intact or are altered. Whether the preference for supply or demand management measures is directly motivated from the underlying paradigm or discourse or vice versa (the paradigmatic or discursive view is influenced by pragmatic considerations about the type of policy instruments to be used) is not directly clear. However, because of the consolidation of property rights, supply management measures seem to have become popular in a short time span among politicians and economic actors.

The arrangements based on private contracts as described above do not apply the neo-classical economic policy instruments as described in chapter 2. Instead, these constructions can be theoretically described by means of (new institutional) theory about incomplete contracts. In general, they are applied on a scale that does not match with the application of neo-classical economic policy instruments. In general, supply measures in water quantity management are location bound and specific for that location. Contrary to neo-classical instruments, incomplete contracts in principle allow for such tailor-made, area specific approaches. Centralistic instruments do not, since these instruments are laid down in laws, which, according to the constitution, may not discriminate between actors. These decentralised approaches to water quantity management seem to fit developments on a macro-level, such as the trend in governance towards deregulation and decentralisation. Because of the relative novelty of the approach, arrangements for water quantity management based on private contracts have not yet been fully explored in scientific, political and administrative circles. This also means that the institutional framework for such arrangements to a large extent still has to be developed.

Towards the end of the chapter, I discussed the application of economic evaluation methods in the evaluation of flood protection strategies. This example took an intermediary position between centralistic instruments and decentralised arrangements. On the one hand, the decision-making process takes place at a national scale, which makes it a centralistic arrangement, while on the other hand, measures to be taken within this arrangement show

characteristics of decentralised arrangements, especially because they are not generic in nature and are location bound. The economic evaluation method discussed was a societal cost-benefit analysis, which was identified as the potentially most comprehensive economic evaluation method. The main conclusions with regard to this method were that this method can never act as the only integrated method for the evaluation of alternative strategies, since not all effects can be expressed in monetary terms. Besides, the presently used form of this evaluation method proved to be unsuitable for the purpose of the study, namely compare the effects of two alternative strategies over a very long time span. Because of these two observations, it was concluded that this method does not fully contribute to integrated water management in the interpretation of 'sustainable water management' .

The structural problems related to (surface) water management as discussed in this chapter are hard to address. For example, the only structural solution of salinisation and subsidence is raising the ground water and surface water level and adapting life in The Netherlands to it. The consequences of such a structural approach were studied in the Rivierenland-project of the *Dienst Weg- en Waterbouw (DWW; Road and waterway-construction services)* of the ministry of Transport, Pubic Works and Water management relating to the policy approach of 'room for the river', as was described in section 5.6. As was argued some times before, integrated water management is about the well informed balancing of the functions aquatic ecosystems fulfil (the products and services they provide) for society and the environment and the demands placed on these systems by societal activities. Explicit attention for and awareness of the value of aquatic ecosystems (either or not expressed in quantitative and/or monetary terms) would make make a substantial contribution to optimisation of human use of surface water systems. However, the analysis of economic evaluation methods showed that the present methods for economic evaluation are insufficient for studying the full range of (positive and negative) effects of such a fundamentally different approach. As such, the present role and content of these methods (which are part of the institutional framework) help sustain traditional approaches to water management.

5.6.6 DIFFERENT NORMATIVE DISCOURSES AT DIFFERENT LEVELS OF GOVERNANCE

Finally, it must be noted that dominant normative discourses (may) differ at various levels of governance. In chapter four, it was shown that at the global level, 'demand management' and 'water as an economic good' were adopted as principles for policy approaches in water management. These principles not only related to drinking water, but also to 'free' water. Applying these principles in a strict sense would mean that surface water would get a price as well, which would probably lead to the introduction of a surface water tax. These principles formulated at the global level have to a large extent been adopted by the EU, via principles such as 'full cost recovery' and the 'polluter and user pays principle'. The present focus in Dutch water quantity management on supply management via (local and regional) spatial approaches contrasts with the normative discourse at global and EU-level. The (relative) droughts in the first summers of the new millenium have made water managers and water users aware that surface water may not always be abundant. However, this awareness has not led to the implementation of instruments for regulating demand, but to those enhancing supply. In itself, this is not a problem, for if there is sufficient water available, there is no need to regulate demand via generally unpopular demand management

measures. Instruments regulating demand only work in situations of relative scarcity, and by enhancing supply, the situation of relative scarcity may be diminished. However, contrary to instruments for demand management, instruments for supply management are less likely to change property rights of water, and (therefore) awareness of its value for society. Besides, they often cost water managers financial resources, instead of raising them, as is the case with generic economic instruments providing a negative incentive.

6

CHAPTER 6 POLICY ARRANGEMENTS IN WATER SYSTEMS QUALITY MANAGEMENT

6.1 INTRODUCTION

In the previous chapter, several policy arrangements for water quantity management were analysed. In this chapter, the same will be done for water quality management. The purpose of this chapter is the same as the previous, namely describing arrangements in water management involving economic steering instruments or evaluation methods, in order to identify (themes and patterns with regard to) factors that enable or disable the introduction of such instruments in water policy and to analyse the degree to which these instruments and methods can and do make a contribution to integrated water management. In this introduction, a definition will be given of 'water quality issues'. In section 6.2, the main current policy issues in water quality management will be presented, together with currently dominant policy approaches to these issues. In the remaining sections of the chapter a number of policy arrangements for water quality management involving economic policy approaches will be analysed. Section 6.3 will address some policy arrangements addressing point sources of pollution. Section 6.4 will analyse some arrangements for addressing diffuse pollution (mainly) caused by agricultural activities. In section 6.5, arrangements for addressing diffuse pollution not originating from agriculture will be analysed. Section 6.6 provides a summary of the findings in the chapter.

DEFINING 'WATER QUALITY ISSUES'

In the previous chapter, 'policy issues' were defined as 'societal issues that have entered the political and/or public administrative arenas and that according to a majority of actors or according to the most powerful actors in these arenas need to be addressed through public policy'. Parallel to the definition of 'policy issues relating to water quantity management' as presented in the previous chapter, 'policy issues regarding water quality management' can therefore be defined as 'societal issues relating to water quality that have entered the political and/or public administrative arenas and that according to a majority of actors or according to the most powerful actors in these arenas need to be addressed through public policy'. As was discussed in the previous section, water quality problems caused by public water quantity management were defined as water quantity issues. Therefore, they will not be discussed in this chapter.

6.2 CURRENT WATER QUALITY ISSUES AND RELATED POLICY

6.2.1 INTRODUCTION

In this section, an overview is provided of the main current issues in water quality management and related policy in The Netherlands. For analytical purposes, policy issues regarding water quality as discussed in this section are divided into point sources and diffuse sources of pollution. Point sources of pollution are defined in this thesis as 'those sources that are fixed in one place and discharge polluting substances directly into water systems'. All other sources of water pollution are referred to as diffuse sources of pollution. The main groups of point sources of pollution are wastewater discharges from industry and effluent discharges from municipal WWTPs. Despite the definition provided above, the distinction between point sources and diffuse sources is not always very sharp. This is mainly the case with fixed sources, such as leaching shore protection or indirect immissions of substances originating from fixed sources via the air or the soil. Wastewater discharges from households that are not connected to the central sewer system are often referred to as diffuse sources of pollution as well. The fact that these structures are very dispersed, the number of sources is large and the source of the pollution is hard to trace usually leads them to being regarded as diffuse sources of pollution. According to the definition given above, however, strictly speaking they belong to the category of point sources of pollution.

Since the entrance of water quality as an environmental policy issue in water management in the 1960s, point sources of pollution have been tackled rather successfully. Of course, some sources still remain, but the majority of the sources have been removed or substantially reduced in impact. The reduction of point sources of pollution was mainly achieved through technical measures and through command and control instruments. Technical measures mainly consisted of the construction of municipal sewer systems and purification of wastewater originating from industry (either by communal WWTPs or private treatment plants), the sewer system and houses not connected to the central sewer system¹⁷³. With the reduction of point source pollution and the industrial and technological development of society, the relative importance of diffuse sources of pollution started to increase. A number of categories of diffuse sources can be identified, based on two criteria for categorisation. The first criterion is whether sources are mobile or fixed, the second criterion is whether sources emit pollution directly into water systems or indirectly via other environmental compartments. The main issues related to point sources and diffuse sources of pollution are discussed below.

6.2.2 POINT SOURCES OF POLLUTION

In this subsection, a description will be given of the remaining point source of pollution receiving the highest attention in policy, namely sewer overflows, related issues and the policy addressing this source and related issues.

¹⁷³ Waste water from dwellings not connected to the central sewer system is usually treated in individual systems referred to as *IBA's* (*Individuele Behandeling Afvalwater*; individual treatment of waste water).

SEWER OVERFLOWS

One of the main remaining point sources of pollution and the one receiving most of the political attention is the overflow of central (i.e. municipal) sewers in periods of heavy rainfall. Until recently, most of the central sewer systems were of the combined type. In this type of system, waste water discharges from households and industry and rain water from hard surfaces were collected in the same system and transported to the WWTPs. During periods of heavy rainfall, these central sewer systems often cannot cope with the amount of water presented and as a consequence the sewer system overflows. These overflows are controlled and constructed points at which the sewer system discharges directly to a surface water system. They are constructed for reasons of safety and prevention of damage to infrastructure and to prevent nuisance in homes. However, obviously, they cause a deterioration of surface water quality.

Cattle illness

An important aspect of policymaking regarding sewer overflows is establishing who benefits and who suffers from the overflows. The actors benefiting most from the overflows are mainly the users of the system. The overflows prevent waste water from re-entering their establishments, and they prevent damage to infrastructure, so no extra charges will have to be raised for financing repair. The actors suffering from the overflows are those actors that depend on good surface water quality in (the vicinity of) urban areas. Examples of such actors are (vulnerable) aquatic ecosystems, swimmers and society as a whole (which pays for the measures to mitigate or undo the negative effects of overflows on surface water systems). One of the presumed negative effects of direct discharges of wastewater onto surface water systems is that cattle may become ill from drinking polluted surface water. Until recently, the problem of ill cattle due to sewer overflows was largely denied by municipalities, the owners of the sewer systems. No formal institutions (regulations) existed that acknowledged and addressed the problem. Besides, a direct link between the overflow of sewers and the death of cattle has never been demonstrated conclusively¹⁷⁴.

Usually, municipalities are granted a licence by water boards (based on the Surface water pollution act) for the discharge of wastewater during heavy precipitation, provided that they remain within the quality standards set for the recipient surface water body. Until recently, the burden of proof of the link between overflows and cattle illness lay with the farmer who's cattle had become ill. In 2001, a commission 'animal health and sewer overflows' (*Diergezondheid en Riooloverstort; Commissie Van Dijk*) was installed by the Minister of Internal Affairs and the Secretary of state of the Ministry of Transport, Public works and Water management to analyse the issue and to come up with solutions to solve it. The advice of the commission was to reverse the burden of proof from the farmer to the municipality (De Water, 2003: 3). This advice, if adopted into formal regulations, will be an important step towards the designation of municipalities as the problem owner (the polluter) and thus as the actor in principle responsible for solving the problem. The costs for this externality would come to fall upon the polluter, which is in accordance to the widely

¹⁷⁴ Source: <http://www.sdnl.nl/edelch18.htm>

accepted polluter/user pays principle (see chapter 4). A shift in the burden of proof is also likely to speed up structural solutions to the problem.

Policy approach and policy instruments

The construction of communal sewer systems and waste water treatment plants, together with the introduction of charges for direct discharges on surface water and for indirect discharges via the sewer system within the framework of the Surface water pollution act (*Wvo*) has substantially reduced point source emissions since the 1970s. However, some *aanhaakpunten* (connections between water chains and water systems) are not fully under control yet. Presently, technical approaches to prevent or mitigate pollution of surface water from sewer overflows are the dominant policy approach to the issue. In principle, two main approaches exist. The first aims at preventing overflows from occurring and is thus preventative in character. The second aims at mitigating the effects of an overflow is thus more curative in character.

In the first approach, the dominant strategy is disconnecting rainwater from the dry weather sewer system (and thus preventing the discharge of precipitation via the sewer system). This can be achieved via a number of techniques, either individual or collective in nature. These techniques will not be addressed in detail here. The disconnection of rainwater from the central sewer system has a number of advantages. Firstly, the volume of water collected in the sewer system is greatly reduced. As a result, overflows are prevented and relatively clean rainwater is not mixed with wastewater. Besides, a more constant and concentrated flow of wastewater is presented to the WWTP, which greatly improves its efficiency. Secondly, the disconnected rainwater may be used for various purposes, reducing the use of drinking water for inferior purposes. Besides, infiltration of rainwater and retention in surface water systems helps fight desiccation and building reserves for periods of water shortage. In the second approach pollution by overflows is mitigated by taking end-of-pipe measures. Again, a number of techniques are available to achieve this, which will not be discussed here. Mitigation by end of pipe measures only aims to reduce the impact of overflows on recipient water systems. It does not have the other advantages of disconnecting rainwater from the central sewer system as discussed above.

As can be concluded from the description earlier, once an overflow occurs, the problem is addressed through jurisdiction. However, with regard to the prevention of the problem, some market-based policy instruments can be and are being applied. Water quality managers (water boards) sometimes issue subsidies to municipalities to speed up the process of disconnecting the discharge of precipitation from the sewer system (Stichting Rioned, 2002: 26). This instrument can be shared under the category of 'state aids' as identified by Stibbe Simont Monahan Duhot as one of five categories of market-based instruments (see also chapter 2) (Stibbe Simont Monahan Duhot, 1994: 48). Besides, subsidies from municipalities or water boards can be and are being given to citizens for water retention measures, such as the installation of a rain water barrel to collect precipitation from the roof. However, the main policy instrument to the issue of overflows is regulation. The central government has formulated a policy called '*basisinspanning riolering*' (basic effort regarding the sewer

system). This policy is based on a recommendation by the *CUWVO*¹⁷⁵ originating from 1992. The policy entails that by the year 2005, municipalities are supposed to have taken measures to reduce the pollution load from sewer systems and unconnected dwellings on surface water systems by a 50%. Measures are directed at connecting unconnected dwellings to the central sewer system, installing decentral waste water treatment systems, disconnecting rainwater, (thus) reducing (the effect of) overflows, (and) improving the effectiveness of WWTPs (amongst others) by offering a more concentrated and stable inflow of waste water. Water boards often help municipalities achieve this goal by providing subsidies and other types of resources and by granting temporary derogation to take structural measures.

6.2.3 DIFFUSE SOURCES OF POLLUTION

INTRODUCTION

As was mentioned before, with the strong reduction in pollution from point sources, diffuse sources of pollution have gained in relative importance. Characteristic for pollution from diffuse sources is that the pollution is released in low concentrations from a large number of dispersed sources, that together can have a major impact (Saeijs and Van Ast, 1996). Pollution by diffuse sources has proved hard to address. A number of aspects contribute to the complexity of this issue. Firstly, the number of diffuse sources is very large. Secondly, the types of diffuse sources are very diverse. Thirdly, the activities causing diffuse pollution are hard to trace, monitor and control. Fourthly, the mechanisms that lead to diffuse pollution are not always well understood. A number of mechanisms of diffuse pollution of water systems can be distinguished, namely leaching, leaking, wear, precipitation of emitted substances, percolation, dumping of waste and discharge of wastewater. Some mechanisms are typical for a specific type of economic activity (public services, domestic consumption, agriculture, industry, transport), others can be found in all categories.

Since the number and types of sources are so large, the issue of diffuse sources of pollution is not addressed by one policy arrangement. For each sector (industry, agriculture, households, public sector), the field of actors will be different, and within each sector, the actor-field may be different for different types of diffuse pollution. For example, in agriculture, different types of diffuse pollution can be distinguished, such as eutrophication caused by fertilisers, disruption of aquatic ecosystems by hormones and/or food supplements and pollution (intoxication) by pesticides. The types of agricultural companies involved in the issue (cattle breeding, agriculture, horticulture) will depend on the activities and mechanisms causing the diffuse pollution. Even for one type of diffuse pollution originating from one type of agricultural activity through one specific mechanism, differences may exist in the impact as a result of the way the polluting activity is undertaken, different measures farmers take to reduce the effects of their activities and not in the least place geological circumstances, such as the type of soil on which the activity takes place. Therefore, even in this situation, different policies may be required to address the issue.

¹⁷⁵ The *CUWVO* stands for *Commissie Uitvoering Wet Verontreiniging Oppervlaktewateren* (Commission for the execution of the Surface water pollution act). Source: <http://www.vng.nl/smartsite.dws?ID=44172>.

Below, a short description will be given of the main activities causing diffuse pollution. For each activity, the main actors involved in the issue and the dominant public policy to address the issue are described. The activities are grouped as much as possible according to the group of economic actors or activities causing the pollution. These groups of economic actors or activities (targets for policymaking) are agriculture, industry, citizens/consumers, transport and public infrastructure. A special source of diffuse pollution is contaminated sludge in water floors. The activities causing this contamination are often diverse and usually do not originate from one specific group of economic actors. With regard to this issue, therefore, policy (whether to address the issue and if so, how) will depend on the severity of the situation and the possibilities to identify the polluters. If polluters cannot be traced (which is usually the case), public measures can only exist of mitigating the effects of existing pollution and preventing new pollution. These activities are paid from the general budget and are a classic example of a negative externality of economic activities.

DIFFUSE POLLUTION BY AGRICULTURE

Three main types of diffuse pollution can be identified caused by agricultural activities:

- eutrophication of surface water systems by application of (organic and inorganic) fertilisers;
- disruption by hormones and/or other food supplements (endocrine disruption);
- pollution (intoxication) by pesticides.

With regard to disruption by hormones, no policy has been formulated yet. The reason for this is the large degree of uncertainty and the lack of consensus in the ontological discourse. It was chosen not to address this issue (discourse) in detail in this thesis. The issues of eutrophication and pesticide pollution will be described below. Since the actor-networks as well as the policy approaches of these two types of pollution differ, they are discussed separately.

Eutrophication

Eutrophication is the situation in which water systems contain such high concentrations of nutrients (a.o. originating from organic waste and/or (natural or artificial) fertilisers) that only a limited variety of organisms can survive. In this situation, a small number of species dominate the eco-system. As a consequence, the eco-systems in eutrophicated water are simple compared to water systems with less nutrients. Eutrophication is mainly caused by nitrate and phosphate surpluses, but can also be caused by (other) organic material resulting in the use of oxygen in water¹⁷⁶. Eutrophication can be caused by a number of mechanisms, which may involve either point sources or diffuse sources. The main point sources used to be the discharge of wastewater containing nutrients from industry and households. As was indicated before, these point sources have been reduced to a large extent. Nowadays, sewer overflows and some illegal discharges of wastewater from households and industry are the

¹⁷⁶ The amount of oxygen needed by (micro-) organisms to 'digest' organic material is referred to as BOD (Biological Oxygen Demand). The total amount of oxygen required to chemically convert organic material into inorganic components (which is a more complete conversion process for which more oxygen is required) is referred to as COD (Chemical Oxygen Demand).

main remaining point sources of eutrophication. The main diffuse sources of eutrophication are fertilisers originating from agricultural and public and private gardens and release of natural nutrients from soils. The latter category is not influenced through policy and will not be discussed in this thesis. With regard to the former category, agriculture is the main source of eutrophication. In fact, it is the most important overall source of eutrophication in The Netherlands. Eutrophication by agricultural activities are caused by both natural (manure) and artificial fertilisers. A major source of eutrophication by 'natural' fertiliser is the spreading on farm land of manure resulting from the bio-industry. In the past, this practice led to the emission of enormous quantities of fertilisers into water systems. These manure-surpluses (and their emissions) have been reduced in the last few decades, but concentrations often still exceed the ambient environmental standards.

Policy addressing eutrophication

Various types of policy approaches towards the excess application of fertilisers exist, using technical, suasive, CAC and financial/economic instruments. The backbone of policy addressing eutrophication is the setting of ambient environmental standards for the concentration of fertilisers in water systems. These standards determine what concentrations (and (thus) immission loads) are allowed, and thus how strong policy efforts will need to be. Several measures are and have been taken to ensure these standards are not exceeded. The most important technical measure is the injection of manure into the soil, which should prevent the emission of ammonia, causing acid rain. Command and control measures include the prohibition of applying fertilisers when the soil is frozen, since in this situation, the fertilisers cannot be absorbed by the soil, causing increased evaporation and run off off the land. A major economic measure was the introduction of a levy on mineral surpluses in 1998 for intensive dairy farming. In future, this levy will be compulsory (in the Netherlands) for all farm types, and tax levels will be increased in order to achieve (EU) environmental goals (Nitrate Directive). This levy will be discussed more extensively later in this chapter.

Pesticides

Pesticides are another important source of diffuse pollution from agriculture. Pesticides are an extremely heterogeneous group of products. Their impacts are correspondingly heterogeneous, with some causing disruption of aquatic ecosystems, and others having impacts on parts of terrestrial ecosystems, such as target and non-target species (e.g. on birds of prey, which accumulate pesticides from preys), either through direct or indirect effects. In addition, because of this variability in their effects across different media, the impact of any one product will be location-specific depending upon which receptors are present, the climate, topography and hydrogeology (ECOTEC et al., 1999: 97).

Policy addressing pesticides

ECOTEC et al. (idem) studied the application of taxes and charges on pesticides in EU member states. In this study, farmers are implicitly recognised as being the main target group of these taxes and charges. However, it must be said that pesticides (often being used as a collective term for growth regulators, insecticides, herbicides, fungicides and disinfectants) are also used by other actors, such as by public organisations maintaining public areas in urban environments and by citizens for the maintenance of their private terrain. According to OECD (1996), taxes or charges on pesticides exist in Denmark, Finland, France, Norway and Sweden. A study by ECOTEC et al. (1999), besides Sweden and

Denmark, also included Belgium. The presently dominant approach to the issue of pesticides in The Netherlands is a combination of SIs (awareness raising and training programs) and CACs (more specifically a selection system for the admittance of specific substances used in pesticides to the Dutch market). Although studies have been done with regard to the possibility of installing a pesticide tax in The Netherlands, no environmental levy was in place in The Netherlands at the time of doing research for this thesis. The main economic instruments are subsidies for measures that reduce the use or impact of pesticides, for example by installing no-spraying zones along surface water bodies. The decision-making process about the use of economic instruments in relation to pesticides will be discussed in more detail later in this chapter.

DIFFUSE POLLUTION BY INDUSTRY

For industry, the situation with regard to diffuse pollution is even more complex than for agriculture. Whereas with regard to agriculture, the group of actors causing diffuse pollution is still rather homogeneous, in industry, there are many different industrial activities, causing different types of diffuse pollution through a large range of different mechanisms, involving many different substances, affecting different actors and/or parts of (aquatic) ecosystems and involving many different groups of stakeholders. Examples of diffuse pollution from industry are exhaust gases, spills, and leaching of substances from produced products. An important portion of attention goes to diffuse pollution from the construction sector (houses, industrial zones and infrastructure). The attention focuses on the release of substances from construction materials.

Policy addressing diffuse pollution from industry

As was discussed in chapter 2, environmental levies can be divided into two categories: emission levies and product levies. Emission levies are directly related to the real or estimated pollution or damage caused, by charging emissions into air, water or soil, or related to the generation of noise. Product levies are applied to (potentially) polluting raw materials and intermediate inputs, such as fertilisers and pesticides and to final consumer products, such as batteries, one way packaging, car tyres and plastic bags. Both categories may apply to industry. Diffuse water pollution via emissions at the factory may be caused by indirect emissions to water via air (precipitation of polluting substances) or soil (percolation of polluting substances)¹⁷⁷. Environmental taxes and charges in EU and EEA countries mentioned in directive COM (97) 9 final directed at emissions relating to industry are taxes and charges on raw materials for and emissions from energy production (potential pollution of water systems via air), water charges and taxes and waste disposal and management charges (potential direct pollution of water or indirect pollution, mainly via leaching). In 1996, Dutch environmental taxes and charges included two taxes or charges on energy products out of four applied in the EU in total, 2 out of 3 emission-related water charges and taxes (sewage charge and water effluent charge, but no general water charge) and 1 out of 2 waste disposal and management charges (waste disposal charge, but no hazardous waste charge) (OECD, 1996). Industry related product levies targeting (potential) pollution of water systems included taxes and charges addressing motor fuels (if used in the industrial

¹⁷⁷ Note that direct emissions into water are shared under point source-pollution.

process), lubricant oil charges, oil pollution charges and solvent charges (see Annex III). Dutch environmental taxes and charges included no diesel charge, no lubricant oil charges, no oil pollution charges and no solvent charges. Such (potentially) polluting substances are generally addressed by command and control instruments combined with voluntary agreements. With regard to the use of materials in the construction sector, policy is directed at banning very hazardous substances and materials and at discouraging moderately polluting substances¹⁷⁸. However, water managers do not have very strong instruments at their disposal to enforce a strict policy in this respect. Economic instruments addressing diffuse pollution by industry are to some extent discussed in section 6.7.

DIFFUSE POLLUTION BY CONSUMERS

Another group of actors causing diffuse pollution are consumers. Together with business (production and service sector), they are the main group of actors using transport infrastructure, the effects of which are discussed further below. Another mechanism through which this groups causes diffuse pollution is uncontrolled disposal of litter (*zwerfafval*). Many activities by citizens/consumers are a potential cause of diffuse pollution. This problem seems mainly behavioural in nature. Many types of diffuse pollution by citizens and consumers could be prevented by awareness raising and 'good housekeeping'.

Policy addressing diffuse pollution from consumers

In 1996, environmental taxes and charges in EU and EEA countries addressing the (potential) diffuse pollution of water systems by consumers' activities (transport excluded, see below) in the category of emission levies included taxes and charges on energy products and waste disposal and management charges. Dutch environmental taxes and charges included no NO_x charge, and 3 out of 4 waste disposal and management charges (a municipal waste charge, a waste disposal charge, a land fill tax or charge, but no hazardous waste charge). Product levies addressed fertilisers, pesticides, batteries, plastic carrier bags, disposable containers, disposable razors, disposable cameras, lubricant oil, oil pollution and solvents. Dutch environmental levies did not include any of these product charges. The reasons for this will be discussed in section 6.7. With regard to both emission levies and product levies, it must be acknowledged that for some of the emissions and products mentioned, their link with water pollution is very indirect and the exact effects of those emissions/products on water systems may not be clear. A remarkable observation with regard to product levies is that the category of medicines and food supplements is not mentioned at all, though this category of product is an increasing source of concern with regard the disruption of the live of certain (aquatic) animal and plant species (endocrine disruptors). A possible (and likely) reason for this was already suggested earlier this section.

¹⁷⁸ A covenant was set up between various public and private parties involved in the construction sector with regard to sustainable building (*Convenant Duurzaam Bouwen*), including guidelines for material use. Besides, a guideline for sustainable building was introduced by the national level government.

DIFFUSE POLLUTION FROM TRANSPORT

Another category of sources of diffuse pollution is transport. In discussing diffuse pollution in this thesis, a distinction is made between transport and infrastructure. Transport addresses only vehicles. Infrastructure is discussed separately below. Transport is undertaken by all categories of economic actors distinguished in this chapter (industry, agriculture, consumers, public authorities). Virtually all modes of transport cause some sort of diffuse pollution, but to different degrees. Diffuse pollution by man-driven modes of transport is small compared to electricity driven modes of transport, which in turn is smaller than fuel driven modes of transport. Diffuse pollution from vehicles may be exhaust gases, leaching of paint and metals, and wear through friction (rubber, metals). Recently, major attention has been directed at diffuse pollution from vehicles in water transport. Especially the application of anti-fouling coatings on boats is heavily debated because of their negative impacts on the aquatic environment. Besides anti-fouling, attention with regard to water transport is directed at the emission of exhaust gases (including gases, fixed and fluid particles), lubricants and fuels. Policy attention directed at water transport can be regarded as an attempt to 'catch up' with road transport, since emissions from water transport have received less attention for some time, while (the strictness of) environmental standards in road transport have developed at considerable pace.

Policy addressing diffuse pollution from transport

As was mentioned in chapter 4, anti-fouling (containing copper) was acknowledged as an issue in *NW4*. In the preparation of this white paper, research was directed at the possibilities for introducing economic instruments to address this issue. The conclusion of this research was that these possibilities were limited. As a consequence, no environmental tax or charge was introduced. The reasons for these limited possibilities were not mentioned. At present, diffuse pollution by anti-fouling is mainly addressed via the presentation of alternatives, such as mechanical cleaning of boats, combined with suasive instruments.

As of 1996, emission levies addressing diffuse pollution related to transport (as defined in this thesis) in a number of EU-member states included sulphur taxes and NO_x charges. These levies were not implemented in The Netherlands. Product levies included differential taxes for leaded/unleaded fuels, diesel and gasoline, vehicle related taxation, tires, lubricant oil charges, oil pollution charges and solvent charges. Dutch product levies included differential taxes for leaded/unleaded fuels, both vehicle related taxations, but no product levy relating to diesel or gasoline, tires, lubricant oil, oil pollution or solvents. However, recently, product levies on lubricants have re-entered the debate and the chances of introduction of such a levy on specific types or uses of lubricants are substantial. Economic instruments addressing diffuse pollution by the transport sector will be discussed in section 6.7.

DIFFUSE POLLUTION FROM INFRASTRUCTURE

The category of infrastructure includes a large range of man-made structures to enable the generation and transport of energy and the transport of people, goods and data. Infrastructure may be owned and/or operated by both public and private organisations. Examples of diffuse pollution from infrastructure are leaching of metals from guard-rails

along highways and of the electricity cables and rails of trains, trams and subways, wear of asphalt, leaching of substances from subsurface pipes, tubes, cables and wires and from constructions for water transport. In 1996, environmental taxes and charges addressing these sources of pollution were non-existent. Either these sources were not an issue yet, or they were addressed in a different way. It is however theoretically imaginable that a product levy is raised on materials that cause diffuse pollution of water systems. However, diffuse pollution by infrastructure is not addressed in this thesis.

DIFFUSE POLLUTION FROM CONTAMINATED SLUDGE

A final important cause of diffuse pollution of water systems shortly addressed here is contaminated sludge. This source is mainly regarded as a legacy from the past, when large quantities of pollutants either originating from abroad or from domestic sources ended up in Dutch water systems, where they settled in the sludge of the Dutch delta. Sludge can be contaminated by all kinds of persistent substances, such as heavy metals, pesticides, chemicals, oil derivatives and medicines. In the past, large oil (and other) spills occurred in Dutch harbours, causing major pollution of sludge, amongst others with PAHs¹⁷⁹. It is generally judged that present levels of emissions to water have been reduced to a degree at which no (substantial) new contamination of sludge will occur.

Policy addressing potential sources of sludge contamination

In 1996, emission levies aimed at preventing the pollution of sludge, included the already mentioned levies addressing motor fuels (see transport), lubricant oil charges, oil pollution charges, solvents, water charges and taxes and waste disposal and management charges. In The Netherlands, no taxes or charges on hazardous waste or batteries (heavy metals) exist, though they may be important sources of sludge pollution. The Dutch policy approach towards these potential sources of pollution will be shortly addressed below and later in this chapter, respectively.

6.2.4 HAZARDOUS WASTE

With regard to hazardous waste, no economic instruments were being applied in The Netherlands in 1996. In a number of EU- and EEA-states (namely Austria, Belgium, Finland, France, Germany, Iceland, Lichtenstein, Norway and Portugal), this is the case. A likely reason for the fact that no environmental levy on hazardous waste was introduced in The Netherlands is the acknowledgement that economic instruments are not likely to fully remove certain products from the market. For the regulation of hazardous waste, which needs to be strictly controlled because of its obvious danger to the environment and society, CAC-instruments are therefore likely to be considered more suitable¹⁸⁰. The only type of economic instruments used in this respect are subsidies for stimulating the transition from

¹⁷⁹ Polycyclic Aromatic Hydrocarbons (PAKs: Polycyclische Aromatische Koolwaterstoffen).

¹⁸⁰ The rate of a levy would have to be very high to prevent economic actors from buying/using certain materials. The general mechanism of market-based instruments is to give incentives to economic actors to reduce (the use of) environmentally adverse activities or materials, not to remove them completely from the market. Other instruments are usually considered more suitable for the latter objective.

the production and use of hazardous substances to more sustainable alternatives. The issue of hazardous waste is not addressed in this thesis.

6.3 ECONOMIC INSTRUMENTS FOR POINT SOURCES OF POLLUTION

6.3.1 INTRODUCTION

In this section, I will discuss economic instruments for point sources of pollution. In EU Member States, the economic instruments for this type of pollution providing a negative incentive almost exclusively consist of waste water taxes. In this introduction, an overview will be given of the application of schemes for waste water taxes in EU member states. Then, in subsection 6.3.2, I will discuss the scheme in The Netherlands. In subsection 6.3.3., I will shortly compare this scheme to two other schemes, namely those in Germany and Denmark. Comparison of a number of schemes for waste water taxes is expected to provide insight into factors that influence the content and application of the schemes under various conditions and (thus) the generalisability of these factors.

WASTEWATER LEVIES IN EU MEMBER STATES

Pollution of waste water from point sources is caused by two main types of sources: direct discharges onto surface water systems by households and industry and indirect discharges onto surface water systems via the sewer system and municipal waste water treatment plants (WWTP). Levies on the use of sewer systems and WWTPs are commonly referred to as user charges. These levies are aimed at financing the costs of building and operating these central systems. User charges for (municipal) wastewater treatment are applied in most EU member states (see table 4.3 in chapter 4), although with different degrees of cost-coverage. Several member states combine user charges with subsidies for sewage treatment, either from domestic sources or from EU structural funds. User charges do not affect entities which for historical or technical reasons are not connected to municipal sewage treatment plants, but such direct dischargers will have to carry the costs themselves of treatment according to specified standards (either the EU Urban Wastewater Directive or stricter national standards), or they will run the risk of receiving a penalty for not complying to effluent standards for discharges to surface water.

Another category of levies that addresses surface water pollution by waste water are waste water taxes. ECOTEC et al. (1999) studied wastewater taxes in EU member states, which they defined as compulsory payments independent of any service received, contrary to the user charge, which can be regarded as a payment for an offered service. Wastewater taxes, according to ECOTEC et al., apply to direct dischargers, i.e. those entities which discharge directly into a recipient water, and possibly to discharge of effluent from sewage treatment plants. The wastewater tax is a classical emission tax on a flow pollutant and was among the first economic instruments to be introduced in environmental policy. A wastewater tax scheme was introduced in France and in the Netherlands around 1970, while Germany followed suit with a scheme that took effect in 1981. Denmark recently introduced a

wastewater tax which took effect in 1997. In other Member States, wastewater taxes are applied at the regional level, such as in Flanders (Belgium), in Italy and in Spain. ECOTEC et al. studied the Dutch, German and Danish tax schemes, because they represent different types of tax schemes. The Dutch scheme is a uniform scheme for all dischargers and for the total of the pollution load discharged (in line with the extended polluter pays principle). The German scheme is closely related to obedience to emission standards (according to the standard PPP). As long as the polluter emits below the emission standards, he does not have to pay a waste water tax. Denmark's new scheme, whilst applying to all dischargers (to the central sewer system) and to municipal/industrial sources and individual dwellings not connected to sewers, offers considerable reductions for large industrial dischargers, and has combined fiscal and environmental purposes (as part of the Danish green tax shift programme).

6.3.2 THE WASTEWATER LEVY IN THE NETHERLANDS

INTRODUCTION

This subsection discusses the waste water tax scheme in The Netherlands. The data were derived from a meta-analytical study by ECOTEC et al. (1999), which analysed various water related environmental levies in EU Member States and EEA-countries¹⁸¹. This study focused mainly on the technical design and technical criteria for selection as identified in chapter 2. The analysis also included some 'concordance'-criteria and a number of technical aspects closely related to concordance, such as the impact on producers, consumers and economic sectors as a whole. In the study by ECOTEC, the tax schemes in member state countries were analysed with regard to the following aspects: the process of the development of the tax, exemptions to the tax, the design of the tax, the revenue and use of revenue, the intentionality of the tax, their complementarity within the portfolio of policy instruments, organisational roles and administrative costs, their effects on producers, their effects on the costs and prices and on product sales, their effects on the environment and their environmental effectiveness, their economic efficiency, impacts on competitiveness and trade, internal market effects, impact on employment, their impact on consumers and equity and distributional effects. These aspects are the same for all the levies discussed in this thesis for which the data were derived from the study by ECOTEC et al. (1999).

The analysis of optimality and concordance criteria is part of what is referred in this thesis as the micro-level of analysis. The limited range of data available for these schemes did not allow the full analysis of all three levels of the analytical framework. However, the discussion of the Dutch scheme does involve some aspects of the meso-level of analysis. Macro-level factors will be discussed in the final section of this chapter, for all economic instruments for water systems quality management at the same time.

¹⁸¹ EEA stands for European Economic Area. Countries in the EEA that are not member of the European Union are Iceland, Liechtenstein and Norway (source: <http://www.ukcosa.org.uk/pages/eealist.htm>).

Characterisation of the level of policymaking

The waste water charge (*verontreinigingsheffing*) was the first ever water quality related environmental charge in The Netherlands. Although mainly collected at the level of water boards¹⁸², this instrument is categorised in this thesis as a centralistic instrument, since charge is based on a law. This means that the decision-making process about its implementation and about the rate of the charge (and other technical characteristics) takes place at the national level. However, the rate of the charge per standardised unit of pollution (*inwonerequivalent*, 'inhabitant-equivalent') may vary, since the costs for waste water purification may vary due to varying local circumstances (quantity and composition of waste water offered, effluent standards, capacity and efficiency of WWTP, etc.). This adaptability to local circumstances may be the very reason for its success. However, the question whether this is really the case was not specifically addressed in this thesis.

Design and development of the levy

A levy system was first introduced by individual water boards, which traditionally organise and finance the major part of Dutch water management. In the late 1960s, the water boards were reorganised and they were provided with the responsibility of collecting levies for discharges. A proposal for large-scale state subsidies to the water boards for the construction of local sewage treatment plants was turned down. This resulted in a full-cost recovery scheme based on revenues from emission charges (in accordance with the polluter pays principle). In 1970, the Dutch wastewater levy was set up with the Surface Water Pollution Act (*WVO*) and came into effect in 1971.

The levy applies to discharges of organic material, nitrogen, arsenic and a number of heavy metals. In 1999, the levy stood at 65 guilders (29 Euro) per pollution unit for state water. For water boards (regional and local water systems), the rate in 1999 was on average 82 guilders (37 Euro) per pollution unit, ranging from 59 to 138 guilders per p.u. (27-63 Euro). The state water levy is thus at the lower end of the spectrum. The levy is imposed on all direct discharges to surface waters as well as on all indirect discharges (via the sewer system). The levy covers the costs of sewage treatment and therefore resembles an ordinary user fee. However, in two important respects, it deviates from a straightforward cost recovery charge. Firstly, the levy does not cover the costs of the sewer network, which is financed via a separate municipal fee. The levy also applies to direct dischargers, i.e. industries and municipal treatment plants which discharge directly to surface water. The Dutch wastewater levy is therefore a more integrated and comprehensive system than ordinary user fees. Secondly, the tax base is not the hydraulic load (cubic meters of wastewater), as is the case with conventional user fees, but the specific pollutants discharged (standardised for indirect discharges via the 'inhabitant equivalent' (*inwonerequivalenten*)). This (in theory) provides an incentive to reduce the pollution load.

¹⁸² Water boards collect the charge for discharge of effluent from communal waste water treatment plants and discharges of other private and public establishments (*inrichtingen*) onto surface water of the secondary and tertiary system. Charges on discharges of waste water into primary surface water systems are collected by the regional directories of Rijkswaterstaat (the state water authority). These discharges mainly originate from larger industries and sometimes communal WWTPs.

MESO-LEVEL ANALYSIS: FORMAL INSTITUTIONS

Organisational roles and administration

The 27 remaining water boards collect levies for discharge to regional water and to their sewage treatment plants (communal WWTPs). Most water boards have been granted operational power by the provinces, but three (out of a total of twelve) provinces have retained responsibility themselves for water management and the collection of levies. Also three municipalities, including Amsterdam, have their own systems in place. Monitoring of pollution is done by the dischargers themselves, but they are subject to sample control from the relevant authorities. All these data were collected in 1999.

Fixed physical infrastructure

The physical infrastructure of communal waste water transport and treatment constitutes a problem for indirect discharges (discharges on to the sewer system) with regard to the equity criterion. Investments in this infrastructure are high, and the depreciation period for these investments is long. Whereas some users of the sewer system and waste water treatment can choose to disconnect and treat their own waste water, other users cannot. This is referred to as the 'dilemma of disconnection' (*afhaakproblematiek*). Consequently, the financial burden of the system is distributed among the remaining customers, who therefore have to carry a larger share of the costs. This development is starting to conflict with the *fairness criterion*, which indicates that target groups of a policy instrument should not be burdened with disproportionately high costs. The large scale waste water collection and treatment system has thus resulted in a lock-in for those actors that cannot choose whether or not they want to be connected to the sewer system.

MICRO-LEVEL ANALYSIS: TECHNICAL CRITERIA

Environmental effect

Several scholars have assessed the incentive function and effectiveness of the Dutch water pollution levy. Bressers (1988) used a regression analysis to show a systematic relationship between the increase of the levy rate and the degree to which different industries control pollution. Schuurman (1988) conducted interviews with 150 enterprises and asked them to rank the significance of different policy instruments in their effort to control discharges. Fifty-four per cent of the enterprises which had reduced pollution pointed to the significance of the levy, while 20 per cent claimed that permit requirements were the reason. The remaining referred to non-policy reasons.

In terms of discharge reduction, the net load on surface waters from discharges has reduced from 45 million inhabitant equivalents (i.e.) in 1970 to 4.6 million i.e. in 1996. This is a significant reduction (90%) compared to 1970 levels. Gross organic discharges from industry have reduced from 28 million i.e. in 1970 to 3.3 million i.e. in 1996, or to 12 per cent of the original 1970 level. According to ECOTEC et al., the revenue recycling to support municipal sewage treatment plants and in-house pollution abatement in industry was a particularly important activity in the early years of the levy scheme, which assisted several of the most

polluting industries in curbing their emissions, thus improving the environmental effectiveness of the levy.

Dynamic incentive

The waste water levy in The Netherlands does give a dynamic incentive to industry to curb emissions, since the height of the levy is based on actual (or estimated) emissions. This is not the case for households, since the rates for this category are standardised according to (an approximation of) number of persons per households. Basing the height of the waste water tax on actual drinking water use via metering is expected to change this¹⁸³. Discussions about this mechanism (*waterspoor*) are presently taking place in Dutch society. Besides the standardised rates for households, a lack of incentive also results from the fact that the financial burden of the water system is low relative to other utilities, such as energy.

Revenues and use of revenue

As was mentioned above, in the early years of the levy, the revenue from the levy was recycled both for supporting the construction of municipal sewage treatment plants and for supporting in-house pollution abatement in industry. In 1996, the subsidy scheme for industry was abolished.

MICRO-LEVEL ANALYSIS: POLITICAL CRITERIA

Complementarity within portfolio of policy instruments (concordance)

The basic regulatory framework for (direct and indirect) discharges of private actors consists of discharge permits based on the surface water pollution act. The levy is a supplementary measure, mainly acting as a financing instrument for the improvement of water quality. However, it was also recorded to provide a dynamic incentive.

Intentionality of the charge

The Dutch waste water charge, although not primarily intended as an instrument aimed at influencing target group behaviour, acts as a true regulative environmental levy. Due to the decision of the national government not to subsidise the infrastructure for waste water collection and treatment, there is a strong emphasis on full cost recovery. The charge was based on actual (large dischargers) or standardised (small dischargers) pollution loads, which made it a (fairly) equitable charge from the polluter pays-point of view.

¹⁸³ This system would be more fair from the polluter pays-perspective than the present system, but is not perfect yet, since the quantity of water used is not necessarily an indicator for the pollution load. To make an ideal levy from the polluter pays perspective, the pollution load from each household would have to be monitored continuously (real-time monitoring). At this moment, this is not considered as a feasible option. As was already discussed before, the volume of waste water produced is also a factor influencing the costs of treatment, showing a directly proportional relationship. With regard to this factor, the system based on actual water use could thus come close to perfection from the perspective of the cost-causer principle.

Equity and distributional effects

Households pay a flat rate according to a presumed household population of three persons. Households with only one inhabitant can apply for a corresponding reduction in the levy. With no account of income levels being taken, the levy has a regressive effect on poorer households within society (ECOTEC et al., 1999). The same can be argued for 2-person households compared to households with 3 or more persons. The more persons per household, the relatively cheaper the levy from a polluter pays-point of view. However, the scheme is generally regarded as fair, and in 1999, there was no discussion on its distributional aspects in The Netherlands.

Fairness

Effects on producers

The introduction of the levy 1970 was a controversial decision and there was considerable concern about the impact of such environmental costs on Dutch industry and the economy as a whole. An important argument against its introduction was the expected negative effect on the competitiveness of Dutch economic sectors. Some water-intensive production processes were particularly affected by the levy scheme such as the pulp and paper industry and the food processing industry. A few potato-flour industries were responsible for nearly one third of total industrial organic emissions and so a special arrangement was made for these industries. Ex post evaluation of the effects of the tax showed that the tax did not result in negative effects on the competitiveness of Dutch industry.

According to forecasts by the Ministry of *VROM* at the launch of the levy, the Dutch water pollution control policy would increase the environmental costs from 1 per cent to 2.5-3 per cent of national income over the period 1970-80. Furthermore, the costs of the Dutch water pollution control policy would amount to an accumulated loss in GDP of 3.4-4.5 per cent over a ten year period (Ministerie van Verkeer en Waterstaat, 1975). Neither estimates took into account the source-related measures employed in many of the Dutch industries, as a consequence of the dynamic incentive. The Dutch wastewater levy system was introduced before completion of the EU internal market. It formed the background for the Commission's 1975 Communication on the Polluter Pays Principle, which allowed the recycling of revenues for support to industries. The CPB-study on the macro-economic effects was updated in 1980 (Ministerie van Verkeer en Waterstaat, 1980). Despite the lower than expected actual economic growth rate experienced in the 1970s, the effect of the water pollution programme on the GDP was much lower than expected. The main cause of this was attributed to the 'anticipated lower need for municipal sewage treatment capacity' (as a result of cleaner technology measures reducing pollution at source within industry) (Ministerie van Verkeer en Waterstaat, 1980: 36).

Impact on consumers

When the levy was introduced, several thousands of consumers took part in an organised boycott campaign against its payment, as the levy was seen as unjust and the water boards as an illegitimate organisation for this task. Consumers did not think of themselves as polluters¹⁸⁴. After a while, however, the cost was accepted from the point of view of the

¹⁸⁴ The story line about problem ownership was identified as an informal institution in chapter 3. In this case, it is an element in the ontological discourse about the issue.

polluter-pays principle. The effectiveness of the tax-programme for Dutch industry resulted in a reduced need for investment in public sewage treatment capacity, and hence in lower costs for households. Gradually, however, this dynamic advantage for all users was offset for households (bound customers) by the disconnection-dilemma described earlier (see 'fixed physical infrastructure'), increasing the relative burden per household.

6.3.3 COMPARISON OF THE SCHEMES IN THREE MEMBER STATES

Ecotec (1999) analysed the waste water tax schemes of three different Member States: Germany, Denmark and The Netherlands¹⁸⁵. These three tax schemes differ considerably and are therefore illustrative for the range of options combining environmental effectiveness with economic and administrative feasibility. The main argument of opponents of the waste water tax schemes was the expected negative effect on competitiveness of domestic industry. This argument was strongly pronounced in the 1970's when the Dutch and German schemes were introduced. The static *ex ante* modelling in the Dutch experience seems initially to have exaggerated the costs of the policy, and later *ex post* modelling as well as comparative work indicates that there were advantages associated with dynamic efficiency gains through more efficient production processes which were seized as a consequence of employing the levy. The Dutch scheme also successfully combined the tax with a recycling of revenue for technology innovation and for process engineering by experienced institutes. This system improved the environmental effectiveness of the levy and its acceptance by target groups. Recycling of revenues seems to be an effective strategy to silence objections by target groups with regard to competitive disadvantages and unfair re-distributional effects.

The German wastewater tax is closely coupled with the system of standards, which makes it difficult for many dischargers to understand why they are liable to a (reduced) tax even when they comply with the standard. The Danish wastewater tax has been introduced under the heading of green tax reform, and has hence had a fiscal impact different from the two other taxes. Due attention has been paid to large dischargers, and the tax reductions offered seem to have made the wastewater tax ineffective in dealing with industrial effluent, which is increasing. As regards municipal wastewater treatment plants, there is evidence to suggest that compliance with standards has improved considerably after the introduction of the tax. The administrative system is simple, even though it also includes dwellings without sewer connection, and relies on the combined expertise of the Customs- and Tax Agency and the local municipal authorities. In conclusion, it seems that the Dutch scheme is most purely based on the extended PPP, followed by the German scheme, which operates some sort of semi-extended PPP. The Danish tax scheme has not met a lot of opposition due to the many exemptions. These exemptions have rendered the scheme environmentally ineffective.

¹⁸⁵ For a detailed discussion of the schemes in Germany and Denmark, I refer to the reference.

6.4 DIFFUSE POLLUTION FROM AGRICULTURAL ACTIVITIES

6.4.1 INTRODUCTION

As shows from Annex III, in 1996, important 'gaps' in the use of economic environmental policy instruments addressing diffuse sources of pollution related to their use in agriculture and to their use regarding the category 'other goods'. Examples of product charges addressing the category of 'other goods' will be addressed in section 6.5. This section discusses policy regarding mineral surpluses and pesticides resulting from agricultural activities. In subsection 6.4.2, the levy on mineral surpluses in The Netherlands will be discussed. Subsection 6.4.3 discusses the application of pesticide taxes in various EU Member States. Subsection 6.4.4. discusses the study of a levy in The Netherlands on emissions from agricultural activities specifically related to water systems. In section 6.4.5, the various centralistic schemes for addressing diffuse water pollution by agriculture will be compared. Finally, section 6.4.6 will discuss decentralised arrangements for addressing diffuse pollution from agriculture.

6.4.2 LEVY ON MINERAL SURPLUSES IN THE NETHERLANDS

As was discussed in chapter 4, the Dutch levy on mineral surpluses was the only levy in the EU in 1996 addressing this issue. Its introduction is shortly discussed from a historical perspective in the part about formal institutions below. As was mentioned before, in this chapter, macro-developments will be discussed jointly for all economic instruments at the end of the chapter. This subsection continues with elements of the meso-level of analysis.

MESO-LEVEL ANALYSIS

Formal institutions

Laws and dominant policy approach

As was described in chapter 4, some EU-regulations had a strong influence on environmental policy in EU-member states. One such EU-regulation is the Nitrates Directive. The main objective of the Nitrates Directive (Council Directive 91/676/EEC) is to reduce and prevent surface and groundwater pollution caused by nitrates from agricultural sources. In the Netherlands, the entire country has been classified as vulnerable, indicating that in the whole country, agricultural production contributes to drinking water problems. Under the pressure of the Nitrates Directive, The Netherlands have been forced to introduce ever more stringent policy measures with regard to mineral losses from agricultural soils. In the end of the 1990s, The Netherlands introduced an accounting system for mineral balances on farms. The system introduced is called MINAS (*MINeralen Accounting Systeem*, mineral accounting system) and operates at a national level. The goal of the system is to reduce the mineral surpluses and to increase mineral efficiency, as part of the Nitrates Directive. With this system, farmers keep records concerning the N and P₂O₅ inputs in purchased feed, chemical fertiliser, and manure, and outputs in animal and plant products. In this way, a mineral balance is set up at farm level. Certain levels of phosphate and nitrogen surplus are allowed

(the levy-free surplus), and these standards are lowered over time. For the surplus above this level the farmer has to pay a levy. Since this levy is charged on the surplus of minerals emitted to the environment, this levy can be classified as a true environmental regulative levy. The MINAS-system is not specifically directed at emissions of mineral surpluses to water systems, but to all environmental compartments. However, mineral emissions to water systems have a strongly negative impact on the quality of aquatic ecosystems. Therefore, the MINAS-system is expected to have positive effects for this quality as well.

The MINAS-accounting system has evolved from a series of earlier policy measures to reduce mineral surpluses. In 1986, the national government had introduced a system of manure production quotas. The quotas were based on historical standard manure production amounts per animal. In order to stimulate lower phosphate (P) and nitrate (N) emissions, the government gave pig and poultry farmers the option of proving that the P and N contents in the feed were actually lower, thus showing they should be eligible for a lower surplus levy. The government thus placed the burden of proof with the target group. In 1990, the *CLM*¹⁸⁶ mentioned the possibility of using the mineral balance as a policy instrument with the possibility of a levy on high surpluses and a premium on low mineral surpluses (via a rebate of revenue). In the 'National Environmental Policy Plan' (*NMP*) (Ministerie van VROM, 1989) a gradual introduction of a mineral balance to reduce mineral surpluses was suggested. The use of levies was not mentioned in the document. In 1992, the *Landbouwschap* (a semi-public agricultural advisory organisation) advised the compulsory introduction of the mineral balance. Eventually, the government introduced MINAS in 1998 to replace the old quota system.

MICRO-LEVEL ANALYSIS

Technical criteria

Environmental effectiveness

MINAS is expected not to have any perverse incentives, because the tax is raised on the pollution itself. This makes it hard to avoid the tax by use of substitutes, as can be the case with a tax on inputs (e.g. fertiliser) as is the policy in some other EU Member States (Finland, Sweden, Austria). Consequently, the levy on surpluses appears to be a far better-targeted instrument.

Administrative costs

Administrative costs for a levy on mineral surpluses (emission-levy) are estimated to be much higher than administrative costs of a tax on fertilisers (product-levy). Since The Netherlands face the threat of penalties from the EU if the ambient nitrate levels are exceeded, the EU, through the Nitrate Directive, may have had a decisive influence on the decision to introduce the levy on mineral surpluses combined with the MINAS mineral accounting system instead of a tax on fertilisers, despite the higher administrative costs for the farmers and the enforcing authority. Because of the threat of (serious) penalties by the

¹⁸⁶ *CLM* stands for *Centrum voor Landbouw en Milieu* (Centre for Agriculture and Environment). The organisation is a foundation for the advancement of sustainable agri- and horticulture with a broadened societal function.

EU, The Netherlands cannot allow itself to run an environmental effectiveness risk. Therefore, the introduction of formal institutions at EU level is likely to have been a crucial trigger in addressing the issue of eutrophication in a serious manner and breaking the deadlock that existed for quite some time.

Political criteria

Intentionality of the levy

The revenues gained from the MINAS-levy are not earmarked. They contribute to the total budget of the Ministry of Finance. Since the levy is not intended for financing water management measures, it can be called a true environmental economic instrument, with the goal of providing an incentive to reduce pollution from nitrates and phosphates. According to a report by ECOTEC and others for the European Union, the move to taxation of surpluses reflects a desire to tax the cause of pollution rather than fertiliser use *per se*, which may be a poor proxy for environmental damage (ECOTEC et al., 1999: 150). The tax on mineral surpluses is based on the 'Polluter Pays Principle', stimulating efficient use of minerals. A tax on fertilisers makes it possible to avoid paying tax by using less minerals as input. However, even with lower overall use, the farmer can still cause environmental pollution by inefficient use of minerals, depending on his management practices.

Impact on farmers

With regard to the effects on producers and on prices, Nieuwenhuize et al. (1995) showed that 41% of Dutch dairy farmers could raise their profits by decreasing the fertilisation level by on average 13%, and almost all Dutch dairy farmers should be able to reduce feed input without any financial loss. If true, this suggests a win-win outcome is possible with regard to the environment and financial performance of agricultural enterprises.

6.4.3 PESTICIDE TAXES

INTRODUCTION

As was already described in the beginning of this chapter, pesticides are very heterogeneous, both in the substances used and their dose-effect relationships, their behaviour in different environmental media and their different impacts on different parts of ecosystems. Because of their heterogeneity, any attempt to design optimal policy instruments for pesticides is likely to be seriously undermined. This does not necessarily condemn taxes to irrelevance in this debate. On the contrary, there is great interest in the use of such taxes, not just as a mechanism for reducing overall pesticide use, but also for encouraging switches away from problematic products towards those that are more environmentally benign. The present attention for taxes on pesticides is likely to be the result of a general failure (in terms of effectiveness and/or efficiency) of other instruments.

Because of the diverging impacts and dose rates at which pesticides are applied, the possibility remains that reducing the total amount of pesticide used in agriculture is not necessarily consistent with an improvement in the environmental situation. In recognition of this, both in terms of design of taxes, and in the information provided to farmers, greater

attention is being paid to the actual threat posed to the environment by various types of pesticides. A rebate of revenue in the form of research, education and training may help in this respect. Taxes now being considered incorporate various bands that differentiate products according to some objective criteria intended to be a proxy for their potential to cause environmental harm. However, there is still much dispute about the question which unit constitutes the best base for a pesticide tax. Different countries in the EU have looked at taxes based on dose, on kilogram of active ingredient and *ad valorem* taxes.

In this subsection, I will first discuss the dominant policy approach towards pesticides in The Netherlands. Then, I will discuss the discourse about the introduction of an EU-wide levy on pesticides. The subsection concludes with a comparison of the tax schemes of a number of EU Member States (Sweden, Denmark and Belgium), leading to a summary of factors influencing their design and implementation.

PESTICIDE POLICY IN THE NETHERLANDS

In The Netherlands, contamination of water systems (both ground water and surface water) by pesticides originates from a number of activities by several economic (groups of) actors. The main groups of economic actors causing pollution are agriculture and public authorities (in maintaining public green areas). As can be seen in a report by EIM/Haskoning (1999: 9) (see below), a number of *ex ante* studies, making estimates of the price elasticity of a pesticide levy, the change in total costs to farmers and the change in gross margin per farmer under different scenarios for specific pesticide chains, was performed that included cases in The Netherlands. Although the results in terms of environmental and economic effects were rather positive, as of 1999, no pesticide levy was in place. Instead of this, the focus in Dutch policy with regard to reducing pollution by pesticides is on the strict regulation, monitoring and enforcement of admitted pesticides, regulations and guidelines with regard to the scope of application (frequency, quantity to be used, installing buffer zones along water ways) and technical measures (such as mechanical weed removal). The decision-making process in The Netherlands regarding environmental taxes on pesticide use related to water pollution will be given in the next subsection, which will address the study of emission levies on agricultural activities based on the *Wvo* (Surface water pollution act).

COMPARISON OF PESTICIDE LEVIES IN A NUMBER OF EU MEMBER STATES

As was discussed in chapter 4, according to OECD (1996), taxes or charges on pesticides exist in Denmark, Finland, France, Norway and Sweden. A study by ECOTEC et al. (1999), besides Sweden and Denmark, also included Belgium. The schemes discussed and compared below are those implemented in Sweden, Denmark and Belgium¹⁸⁷. According to ECOTEC et al. (1999), two of the three taxes (Denmark and Sweden) have been implemented in a 'meaningful' way. The base for the tax – whether it is per dose, per kilogram of active ingredient or *ad valorem* in nature – is expected to affect the way in which target groups respond. The Belgian tax scheme shows that it can also influence the position of other actors, such as 'environmentalists', regarding the tax, because the base of the tax influences

¹⁸⁷ For a detailed discussion of these tax schemes, I refer to the reference.

its environmental effectiveness. Farmers in Denmark expressed concerns with regard to their competitive position in the EU market. They were concerned that they would be unable to use specific products that are freely used in competing countries. On the other hand, the Danish tax was used to finance a reduction in land tax values, which was designed in such a way that farmers who would be most affected by changes in pesticide prices would, *grosso modo*, also be the ones benefiting most from the reduction in land taxes. This regulation can be seen as a step towards 'greening' the tax system in Denmark.

The rebate of tax revenues can be an important factor in the acceptance of the tax by target groups. This mechanism may even result in a double environmental benefit of the tax: a regulative effect of the tax itself, combined with a programme to optimise pesticide use paid with the tax, thus (further) reducing any negative impacts on the environment and upon farmers (through lower costs for pesticide purchase, since lower amounts are needed). As such, it may even lead to an economic benefit to the target group (pollution prevention pays). This mechanism has clearly played an important role in the acceptance and effectiveness of the pesticide taxes in Sweden and Denmark, where some funds are also used to support organic conversion. Both Sweden and Denmark now have significant organic agriculture sectors.

Some evidence suggests that in Sweden, farmers regarded environmental performance as an important attribute that would improve their competitiveness within the EU market after accession. The reason that this argument was used by Swedish farmers and not by (many) farmers in other Member States could not be retrieved from the available data. Nor is clear how farmers arrived at this notion. This may have been achieved through the training schemes payed from the tax revenues. Another explanation could be that in Sweden (and maybe also other Scandinavian countries), more eco-centric policy paradigms are adhered to by citizens in general and more specifically farmers. This 'internalisation' (*verinnerlijking*) of the sustainability-concept by farmers seemed to be an important factor in the acceptance of the tax scheme in Sweden. Further study of this mechanism can generate some interesting insights in how this internalisation was achieved. However, research for testing this hypothesis falls outside the scope of this thesis.

ECOTEC et al. (1999) mention as an interesting aspect of the two taxes implemented (Sweden and Denmark) that they have not specified wide exemptions. This contrasts with the Belgian eco-tax design, where exemptions have made the tax completely 'toothless'. The Belgian pesticide tax case showed that (the proposal for) abruptly introducing a high eco-tax on pesticides can have detrimental effects on its implementation, because of target group protests. Although in theory the tax could be an efficient and perhaps an environmentally effective instrument in pesticide policy, the high starting rate of the tax made it politically inefficient and ineffective¹⁸⁸. The proposed high tax rate in Belgium resulted in a *de facto* 'freezing' of the introduction of the tax (by exempting all categories of users). In contrast, in Sweden and Denmark the introduction of the tax occurred relatively smoothly, because of the incremental increase in the tax rate, combined with a low initial rate of the tax. The risk of massive protests in case of a high initial tax rate poses a dilemma. In chapter 3, it was

¹⁸⁸ See the distinction made by De Savornin Lohman (1994) between technical effectiveness and political effectiveness, as described in chapter 2.

discussed that according to De Savornin Lohman (1994), the initial tax rate has to be close to the ideal rate, because constant adaptation of the rate would decrease its credibility. This conflicts with the observation based on the Belgian case that a proposed high initial rate of the tax may lead to a 'blocking' of the tax by target groups. The solution to this dilemma may lie in the design of a tax that starts at a low rate, but that enables (and communicates) a stepwise increase of the tax rate, as was the case in Sweden and Denmark.

As was mentioned above, in Belgium, the introduction of an original design for an eco-tax failed because its high starting rate. The charge introduced after the failure of the initial eco-tax was a compromise between the political and societal pressure by the advocacy coalition to take measures to reduce pesticide use and the pressure by the opposing coalition to spare the agricultural sector. Besides, government authorities offered agricultural representatives the choice between two schemes, with the most stringent scheme acting as a stick (a back-up) behind the more lenient scheme. This combination of factors and forces resulted in the acceptance of a charge that had a rate similar to the tax in Sweden. However, this observation does not automatically mean that the charge has been implemented in a meaningful way, as was indicated by ECOTEC et al. (1999) (see earlier).

EU-WIDE REGULATORY FRAMEWORK FOR LEVIES ON PESTICIDES

Some studies have been conducted on the possible introduction of an EU-wide regulatory framework for levies on pesticides. In 1999, a report of EIM/Haskoning was issued studying advantages and disadvantages of an EU wide framework for levies on pesticides (EIM/Haskoning, 1999). The study deals with the plant protection products that are covered by Council Directive 91/414/EEC. According to the report, this directive, at the time of publishing, was the most prominent regulation concerning the placing of plant protection products on the EU internal market. Whereas administrating this Council Directive will eventually decrease the number of active ingredients on the internal market, full implementation is expected to take quite some time. The problem is that each and every substance available will have to be judged with regard to its toxicity and (therefore) its admission to or rejection from use within the EU.

Given the implementation problem mentioned above, and given the fact that administrating the directive will mainly ensure specified safety standards for admitted pesticides without affecting the quantities used, the report signals a need to broaden current European Union policy activities on pesticides¹⁸⁹. As a consequence, DG-XI (the DG of Environment of the EU) initiated a long-term research project in co-operation with the Dutch Ministry of *VROM*, aimed at developing and evaluating new instruments and strategies for additional EU pesticides policy. In this project, eight studies were conducted. In some of these studies, a levy on pesticides was regarded potentially effective in reducing harmful pesticides in the European Union. However, a comprehensive *ex ante* evaluation of the possible economic and environmental effects of such an EU-wide levy was not part of the key objectives of the project (EIM/Haskoning, 1999). In 1997, DG XI initiated a separate project to investigate the

¹⁸⁹ It must be noted that specifying safety standards is a pre-condition for the formulation of additional measures. Therefore, this step can be seen as a necessary, but insufficient step towards reducing pesticide pollution.

advantages and disadvantages of such an EU-wide levy, and to define the contours of an EU-wide regulatory framework for the taxation of pesticides. The need to study the effects of an EU-wide levy was warranted given the implementation problems of the council directive (91/414/EEC), the necessary environmental improvements in the European Union to reach the ambitious goals set out in the Fourth Environmental Action Program, and the need to harmonise the internal market on this subject.

In the new study, research was done on the experience available in Member States, on the characteristics of an ideal EU wide levy, on potential bottlenecks, on the main economic and environmental effects and on the ideal regulatory framework. As a condition for an ideal case, it was argued that the levy should be introduced at the level of the European Union to counteract possible fraud at inter-borders. Another condition is that the levy should imply a permanent incentive to the farmers: either to use pesticides more efficiently at the farm or to change to less-harmful pesticides. These preconditions imply that a market-based pesticide policy of the European Union would have a long-term environmental rather than a short-term political perspective. Some conclusions of the report were:

- Introducing an EU wide levy on pesticides will be both effective and useful. It will be effective a.o. in so far as (registered) pesticides used in the agricultural sectors of the EU Member States fall under the levy. It will be useful because it forms an 'excellent addition to Council Directive 91/414/EEC. Moreover, it will further stimulate industry to innovate towards more environmentally friendly pesticides. Finally, it will be useful because Member States' arguments on possible 'leakages' at the borders and the harming of domestic farmers and industry will become trivial;
- Although a levy on pesticides is judged effective and useful compared to other policy instruments, such as arrangements and regulations to reduce the use of harmful pesticides in the European Union, many scientists and policymakers involved believe that speeding up the review of Council Directive 91/414/EEC (EU, 1991) is the most effective policy instrument (at the time the report was published);
- The ideal EU levy on pesticides consists of five essential features: (1) it discriminates effectively among the various pesticides (according to environmental impact), (2) it is set at the correct rate, (3) it has an efficient collection and effective reimbursement system, (4) it is fraud proof and (5) it provides a permanent incentive to the farmers;
- The review of fifteen European studies shows that the demand of pesticides at the farms is so-called relatively inelastic. The price elasticity of some specific herbicides, fungicides and insecticides are, however, more elastic;
- An EU wide levy on pesticides of 20% will have a substantial impact on their use. The economic effects of a levy on pesticides of 20% are estimated limited, because of the limited contribution of pesticides to the total costs of agricultural businesses;

According to the report, the five essential features for an EU wide levy cannot all be met. The first two conditions are confronted with major obstacles. The other three conditions of the ideal EU wide levy pose no major obstacles. The main obstacles as mentioned in the report are:

- the exact environmental effects of many pesticides are not known, and when they are known, the various types of environmental damages are difficult to summate into one single target. Hence, it is not possible to discriminate perfectly among the various

pesticides. This uncertainty thus relates to the ontological discourse and its translation into normative and strategic elements of policymaking;

- the optimal rate of the levy cannot be determined. On the one hand, this is because the environmental effects of pesticides cannot be expressed in monetary terms, on the other hand, this is because relevant information on the efficiency of pesticide use at the farms and the number and quality of environmentally-friendly alternatives is still limited. This uncertainty thus feeds the strategic discourse.

So far, no definitive decision has been taken on whether or not to implement an EU wide pesticide levy. Whereas in principle, an EU wide levy is regarded as a potentially effective and equitable instrument, the discussion above shows that design and introduction of such a levy is beset with major obstacles. The main obstacles are lack of knowledge about the dose-effect mechanisms of pesticides and methodical limitations in the assessment of damage to the environment resulting from this lack of knowledge and the impact of the levy on pesticide emissions.

From the discussion of this scheme it can be concluded that changes in the institutional framework can alter the policy discourse because it can take away crucial arguments of policy coalitions, thus reshuffling the power positions of actors and actor coalitions in the policy arrangement. However, EIM/Haskoning (1999), who performed the study, stated that the introduction of an EU-wide regulatory framework would encounter substantial technical and political difficulties. The difficulty with such a framework regulation would be to get all (or most) Member States (and their constituency) to agree with such a regulation, despite regional differences in geography, institutional settings, crops, techniques, etcetera.

CONCLUSION: STIMULATING AND OBSTRUCTING FACTORS

Whereas pesticides are used by several groups of economic actors (such as organisations maintaining the public 'hard surface', citizens and agriculture), by far the largest amounts of pesticides are used in agriculture. Policy approaches in EU Member States and at the EU level therefore mainly focus on agriculture as a target group. Environmental economic instruments are already being used in some member states (a.o. Denmark, Finland, France, Norway, Sweden and Belgium) and studies are being undertaken to assess the possibility of introducing an EU wide pesticide levy. The main argument for such a levy is that an EU wide levy would render objections to a pesticide levy based on the arguments of 'leakage' at the borders and damage to the competitiveness of domestic agriculture and industry in case of unilateral introduction of pesticide levies in Member States trivial.

From the discussion of the schemes, a number of factors can be derived that influence the policymaking process concerning pesticide levies. The design of a levy (especially the height of the tax rate) has great influence on the acceptance by the (envisaged) target groups. It was shown that in some arrangements, especially the Belgian, the height of the tax was reduced under pressure of the target group(s) and stakeholders indirectly affected by it. The reduction of the height of the tax led to a situation in which the regulatory effect was substantially reduced or even completely annihilated. The result is that in such a regime, the main effect of the tax is the generation of tax income.

The cases of Sweden and Denmark showed that a redirection of the tax revenue to the target groups in the form of property tax reductions, support to organic farming, and/or advice, education, research, development and technical assistance on pesticide use enhanced the acceptance and environmental effectiveness of the tax. Without such a system of revenue recycling, environmental effectiveness will be limited, because of perceived relatively inelastic responses. Revenue recycling also increased the acceptance of the tax because of a perceived increase in transparency by the target group and a reduced fear for competitive disadvantages.

The fact that many factors play a role in influencing pesticide sales makes it difficult to single out the effect of the (changes in) pesticide tax. Besides, relationships between tax, reduction of pesticide use and environmental effects are far from straightforward. For example, a decrease in pesticide sales does not yet mean that the ambient concentration of pesticides in water systems will decrease. The uncertainty about the influence of the pesticide tax on ambient pesticide concentrations intensifies all three discourses and makes this instrument less favoured compared to CAC-instruments in addressing this issue. This was suggested by De Savornin-Lohman (in: Opschoor & Turner, 1994: 55-67), who argued that politicians try to avoid schemes that pose an environmental effectiveness risk. In The Netherlands, no pesticide levy exists. The reasons for not implementing economic policy instruments in Dutch pesticide policy are explored in the next subsection.

6.4.4 EMISSION LEVIES ON AGRICULTURAL ACTIVITIES IN THE NETHERLANDS

INTRODUCTION

As was shown in the first part of this section on policy for diffuse pollution from agriculture, so far, no levies have been introduced in The Netherlands to specifically address water pollution from these activities, neither for fertilisers, nor for pesticides. Within the framework of the MINAS-system, an environmental levy was introduced. This levy did not specifically address water pollution by fertilizers, but for example also emissions of ammonia into air. With regard to pesticides, no centralistic economic steering instrument was implemented at all. The possibility of introducing emission levies on agricultural activities causing water pollution was studied at the end of the 1990s, in the preparation of *NW4*. Despite their judged feasibility, no such levies were introduced. This section will address the decision-making process regarding these water-specific levies.

STUDY ON A WVO-LEVY IN PREPARATION OF THE FOURTH NATIONAL POLICY PAPER ON WATER MANAGEMENT

As was mentioned in chapter four when addressing the policy resolutions of *NW4*, a number of research projects was performed in preparation of this white paper. One of those research projects was called 'NW4-financing'. Within this project, one task force focused on levies in the agricultural sector. One of the ideas was that a levy could be raised on pollution of water systems by agricultural activities, based on the *Wvo* (Surface water pollution act). Amongst others, this idea was based on an advice by a commission that investigated the financing

structure of water management in 1992¹⁹⁰. This commission advised a standardised (lump sum) *Wvo*-levy for the agricultural sector, based on the number of hectares per enterprise and a standardised charge per hectare based on average emissions. The commission judged that from the perspective of a fair application of the polluter pays principle, such a *Wvo*-levy was logical, since the majority of the total pesticide load on regional waters (95%), about 10% of the total load of phosphorus on regional waters and about 41% of the total nitrogen load on regional waters originated from agriculture. Yet, the cabinet decided not to introduce such a levy in the short term, since it feared that it would delay the execution of the policy that had just been introduced for manure, minerals and pesticides, which was based on other than economic policy instruments. The Minister of V&W did however make a promise to the Lower House that an investigation would be performed regarding the way a standardised *Wvo*-levy could be designed and executed. This study would also consider possibilities to link with the existing accounting system for minerals (MINAS, see earlier).

The investigation was performed in the period of preparing the *NW4* and the report was published in 1996 (LEI-DLO and DHV, 1996). The conclusion of the investigation was that a *Wvo*-levy on emissions from agricultural and horticultural soils was juridically feasible. A further conclusion was that the pre-conditions raised by the *Wvo* for such a levy would make it technically very difficult to design the levy in any other way than as a standardised levy. These pre-conditions are that the taxable activity (*belastbaar feit*) has to be proved and that a clear causal relation has to exist between an activity and pollution of a surface water system (*causaliteitsvereiste*). Since for diffuse sources of pollution these conditions could not be met (because of a lack of knowledge about exact dose-effect relationships), a variable levy based on actual pollution load was judged infeasible. However, according to the study, the law did provide opportunities for the introduction of a standardised levy. A standardised levy is a levy the height of which is based on average figures for certain characteristic variables per agricultural or horticultural enterprise, which serve as the basis for an approximation of the emitted pollution. Such a standardised levy is therefore not based on actual emissions of polluting substances. Basing the height of the levy on actual emissions was considered technically, financially and institutionally unfeasible.

Details of the study (micro-level analysis)

Technical criteria

The study investigated possibilities for a levy based on the current parameters of the *Wvo* (such as oxygen binding substances and heavy metals) and parameters that are more specifically related to agriculture (such as total phosphorus, total nitrogen and pesticides). Since the *Wvo*-levy does not distinguish between economic sectors, a levy based more specifically on agriculture-related parameters would also have consequences for other economic sectors than agriculture. The *Wvo*-levy, as already exists for discharges from industry and sewer systems (see earlier this chapter), is primarily a levy with a financing purpose, based on the polluter pays principle. Research has proven that the levy does also show a regulative effect (it provides an incentive to reduce polluting behavior). According to the study, the emissions of substances from agricultural and horticultural soils are

¹⁹⁰ Commissie Onderzoek Financieringsstelsel Waterbeheer; or Commissie Zevenbergen, named after its chairman.

determined by various factors, such as weather conditions, soil characteristics, management practices and structural company characteristics. An optimal levy would make the levy variable with regard to (at least a number of) these factors. Basing the height of the levy on variable characteristics, however, contributes considerably to the complexity of a levy.

Conclusions with regard to existing parameters

Based on the study, a number of conclusions were drawn by the authors of the report (LEI-DLO and DHV, 1996). With regard to existing parameters of the levy, it was concluded that the design of the Surface water pollution act and the related levy already allowed for making diffuse emissions from agricultural and horticultural enterprises subject to the levy. However, the design of the existing *Wvo*-levy does cause a number of problems. The first problem is providing proof for a taxable fact. The diffuse character of the emissions often makes it difficult to prove which agricultural soils do and which don't emit polluting substances to surface water. The second is determining the pollution load per individual enterprise subject to the levy. This problem is caused by the fact that measuring and monitoring the actual load from a specific parcel of land is not possible due to the diffuse character of the emissions, the fact that standardised coefficients are not available and the fact that the presently common standardised levy based on the category 'small enterprises' shows a weak link with actual emissions. The third is that the existing parameters of the *Wvo*-levy show only a weak relationship with the emitted substances from agricultural soils. The report further concludes that within the existing framework of the *Wvo*, a levy based on an average pollution load per hectare may have good perspectives. This conclusion is in line with the advice of the Commission Zevenbergen in 1992. The problem with such a levy, however, is that it is not directly based on the polluter pays principle and (as a consequence) does not provide an incentive to reduce emissions. From the description above, it shows that because of their complexity an information deficit and (therefore) a lot of uncertainty exists with regard to the mechanisms involved.

Conclusions with regard to parameters more relevant for agriculture

The report concludes that the relation between discharges from agricultural and horticultural soils and the emissions to surface water is more clear for nitrogen than for phosphorus. Phosphorus is more easily fixed in the soil and is hardly emitted to surface water as long as the buffer capacity of the soil has not been exceeded yet. In order to assess true phosphorus emissions, the degree of phosphorus saturation has to be assessed for each parcel of land, which is very complex and will cause substantial technical difficulties.

Political criteria

Intentionality

The mineral-levy on nitrogen losses within the framework of the mineral-accounting system aims to have a regulative effect (a true environmental levy). A levy within the framework of the *Wvo* is primarily intended as a revenue raising levy for financing water quality related management activities. Multiple levies addressing the same type of emission do not constitute a problem from a legal point of view as long as the goals of the levies are different. However, a multiple levy may cause considerable problems with regard to target group support.

Conclusions with regard to financial consequences within and between economic sectors

The choice of parameters on which to base a *Wvo*-levy is very decisive for the degree to which the agricultural and horticultural enterprises will be charged. The more the levy is based on variable characteristics of the enterprises under consideration, the more the levy will lead to variation in the tax burden for single enterprises, in favor of companies that emit less than average polluting substances and at the disadvantage of the ones that emit more than average. In case these variables are related to the environmental impact of the substances involved, such a levy will be fair from the polluter pays-point of view. With regard to the redistribution of the burden between economic sectors, the effects of a levy based on agriculture-related parameters vary for the various substances. A levy on pesticides, including agriculture as a category subject to the levy, would lead to a substantial redistribution of the financial burden. The total financial burden for industry would be reduced from about 3 million euros a year to zero, the total financial burden for households would reduce from about 6 million euros to about 0.3 million euros and the total financial burden for agriculture would rise from zero euros to about 8.6 million euros a year. A levy on phosphorus, including agriculture, would lead to an estimated reduction of the total financial burden for industry from about 15 million euros to about 8.6 million euros, an increase of the total financial burden for households from about 30 million euros to about 32 million euros and an increase for agriculture from zero euros to about 5 million euros a year. A levy on nitrogen, including agriculture, would lead to an estimated reduction of the total financial burden for industry from about 30 million euros to about 12 million euros, a decrease of the total financial burden for households from about 60 million euros to about 42 million euros and an increase for agriculture from zero euros to about 37 million euros a year. These figures relate to emissions on regional waters systems. The report by LEI/DLO does also provide data for the primary (national) water system, but for simplicity reasons, these are not discussed here. It can be concluded that with the existing parameters for the *Wvo*-levy, industry and households indirectly subsidise agriculture for the amount of about 50 million euros.

Assessment criteria

The various alternative levies studied in the report, based on various parameters, were judged by the authors with regard to four criteria: the degree to which they are based on the polluter pays principle (i.e. the degree to which there is a clear relationship between the activity, the pollution of surface water and the height of the levy), the legal feasibility (the degree to which the levy fits the Surface water pollution act), the administrative burden for the target group and the perception costs for the relevant public authorities (all the costs related to collecting the revenues of the levy, such as monitoring, administration and enforcement costs). The alternatives studied were thus judged with regard to environmental, institutional, fairness and efficiency criteria, respectively. With regard to the relationship between taxable base (*maatstaf*) and the degree of pollution, in general it can be said that levies based on variable parameters have a better relation with the degree of pollution than a standardised levy. Between the levies based on variable parameters, however, there is considerable variation with regard to this criterion. With regard to legal feasibility, the conclusion of the authors was that each alternative studied showed good compatibility. For most alternatives, the administrative burden for the target group was limited or moderate. With regard to fertilisers, in many cases, good opportunities existed to link the administration to the mineral accounting system or other statistical information. For

pesticides central registration of type and quantity of pesticides produced, imported and traded could provide the required data. For most alternatives, especially those directed at nutrients, perception costs were judged limited or moderate. However, the perception costs of variable levies on pesticides were considered substantial, for reasons mentioned earlier in this chapter.

With regard to the balancing of various selection criteria, the following remarks can be made. Usually, taxable bases that have the most direct and pure relationship with the degree of pollution also entail the highest administrative burden for target groups and the highest perception costs. Therefore, the choice of the taxable base is typically a trade-off between fairness from the perspective of the polluter pays principle and the fairness and efficiency from the perspective of administrative and perception costs of the instrument. Basing the tax on a 'pure' taxable base is likely to raise protests from target groups because of the high administrative burden and from other actors with regard to the efficiency of public policy (because of the high perception costs). On the other hand, basing the tax on a standardised taxable base is likely to raise protests from target groups because of the lack of fairness from the perspective of the polluter pays principle, and from other actors (such as scientists, public administrators, politicians and environmental NGOs) because of a lack of dynamic incentive to change to more sustainable agriculture.

The decision-making process regarding the introduction of a Wvo-levy for agriculture (meso-level analysis)

Despite the positive overall judgment of various alternative levies by the authors of the report (LEI-DLO and DHV, 1996), no such levies were introduced. Explanations for this may be found in the political arena as was described in chapter 2, based on an analysis by De Savornin-Lohman. His hypothesis was that presently dominant public actors prefer command and control- or suasive instruments and the related administrative decision-making arena over economic instruments and the related more explicit political arena. With regard to economic policy instruments for diffuse pollution from agriculture, a policy officer of the Ministry of Agriculture, Nature management and Food quality (LNV) was interviewed. According to this policy officer, the attention for economic policy instruments in agricultural environmental policy is very much dependent on the composition of the various organisations in the political arena, especially the cabinet and the Houses of Parliament. While in the end of the 1990s, left wing politicians at the ministries of VROM (Housing, Spatial Planning and the Environment) and LNV (Agriculture, Nature and Food quality) stimulated research on the applicability of economic instruments for environmental policy, the present Christian Democratic minister at LNV, whose party has a tradition of representing agricultural interests, soon removed economic environmental instruments for agriculture from the political agenda. The argument not to consider the introduction of economic policy instruments for agriculture was that these instruments would increase the administrative and financial burden on the target group already subject to ever more stringent policy regulations. Another set of policy instruments would endanger the continuation of a substantial number of agricultural enterprises and the international competitive position of the Dutch agricultural sector. As we have seen before, this is a standard argument of opponents of environmental levies, which, if true, can only be offset by a proper revenue rebate scheme or an EU-wide regulation. Besides, as was mentioned before, the introduction of another set of policy instruments might hamper the effectuation

of the (at that time) recently introduced set of policy measures based on the mineral accounting system.

Finally, the present minister at VROM, originating from the liberal VVD-party, does not seem to be as much in favor of economic instruments for environmental policy as her left-wing predecessor in the end of the 1990s. (The combination of) Two reasons may account for this. The first is that these type of (centralistic) economic instruments for environmental policy do not fit the general trends in policymaking of decentralisation, deregulation and liberalisation. Centralistic economic instruments are based on national laws stipulating the terms by which the instrument should be implemented and enforced. These detailed instructions at the national level limit possibilities for lower tiers of government and for the market to shape policy according to their views and preferences. The fact that policymaking according to the trends mentioned is one of the central points of attention of the present Minister of VROM became quite clear from the most recently published white paper on spatial planning (*Nota ruimte*) (Ministerie van VROM, 2004) published by that Ministry. Contrary to the former left-wing minister of VROM, who adhered to a centralistic and protectionist policy on spatial planning, the current minister aims to leave spatial planning as much as possible to the discretion of lower governments, who she judges to be sufficiently capable of representing the general public interest and of keeping a broad perspective that should prevent disintegration of national policy and fragmentation of the landscape. Besides, more room is created for private initiatives, including the involvement of private actors in management arrangements, by shaping a framework of regulations in which stakeholders are (more or less) free to manoeuvre, instead of regulating the playing field in detail. Without discussing the capabilities of lower public authorities in this respect, the question can be raised whether or not these lower public authorities really have a clear interest in representing the general public interest (including often underrepresented interests such as nature and the environment) and in keeping in mind the broader perspective. As was already discussed in chapter four, local political interests may conflict with the public interest (because of personal opportunistic interests) and may diverge from those of the national government. A reason for the latter is that in local politics, the relationship between politicians and their constituency is more direct, and therefore, politicians may be inclined to respond more directly to signals from this constituency. The questions with regard to this policy is thus whether local authorities can withstand the pressure from (powerful) local private actors and whether these authorities are able to base their decisions on considerations that exceed the level of their own mandated territory. Besides, political decisions at the local level may be more directly influenced by pragmatic considerations, such as financial feasibility of policy than politicians at the national and (even more so) the European level, which can permit themselves to base policy on more fundamental, paradigmatic considerations.

A second reason may be that the present minister of VROM does not adhere the same paradigm on the man-nature relationship (see chapter 2) as did her left-wing predecessor. The paradigm adhered to by the present minister tends more towards the 'frontier economics'-side of the spectrum, while that of her predecessor tended more towards the

'deep-ecology'-side of the spectrum¹⁹¹. As was discussed in chapter 3, in the paradigms leaning towards the 'frontier-economics' side of the spectrum, economic interests are usually placed higher in rank on the priority ladder than environmental interests. Besides, negative effects of economic activities on the environment are regarded as externalities of the present production and consumption system, and therefore will always (continue to) play a marginal role. In other words, the paradigmatic view on the man-nature relationship within this paradigm does not provide an incentive to fundamentally change the economic system. The reduced importance of the environment on the political agenda due to the shift in balance between political parties is illustrated by the fact that in the previous cabinet, the Minister of VROM was responsible for environmental policy, while in the present cabinet, this task has been delegated to a Secretary of State.

6.4.5. COMPARISON OF LEVIES FOR DIFFUSE WATER POLLUTION BY AGRICULTURE

INTRODUCTION

The previous subsections discussed a number of economic policy instruments for addressing diffuse water pollution by agriculture. In this section, these instruments will be compared with regard to factors at the meso- and micro-levels of analysis influencing their design and application (thus their content and role). As was mentioned before, the macro-level of analysis will be discussed at the end of the chapter, for all instruments addressing water quality issues. The instruments discussed are all of the centralistic type. Various varieties of levies have been studied to address both pollution by pesticides and fertilisers. These varieties included a tax on pesticides at various points in the product chain, from taxes on raw materials for production and import, via whole-sale and retail to emissions from actual use. The same counts for fertiliser or mineral levies. With these levies, often a distinction is made between levies on natural fertilisers (manure), artificial fertilisers and levies on total mineral use or emission. The types of instruments studied are presented in table 6.3 below. It must be noted that some of the levies discussed in this subsection were analysed more extensively within the framework of this thesis than others. As a consequence, not all instruments can be compared with regard to all the factors identified in chapter 3. Nevertheless, comparison of the instruments with regard to remaining factors is expected to yield useful insights for the purpose of this thesis.

¹⁹¹ Note that since both persons are or were members of the cabinet, both paradigmatic views probably lie still rather centrally on this spectrum, which represents a moderate and not an extremist viewpoint. Therefore, differences in paradigmatic views are a matter of emphasis on a gliding scale.

Table 6.3: agricultural levies studied

Levy	Pesticide tax	Mineral tax	Fertiliser tax	Agricultural levies based on Surface water pollution act
Characteristics				
Point in product chain	Product levy	Emission levy	Product levy	Emission levies
Countries studied	Netherlands, Belgium, Sweden, Denmark, EU-wide framework regulation	Netherlands (MINAS)	Netherlands, Norway and Sweden	Netherlands
Implemented (I) or studied/considered (S)?	I: Belgium, Sweden, Denmark S: Netherlands, EU-wide framework regulation	Netherlands: I	I: Norway, Sweden S: Netherlands	Netherlands: S

MESO-LEVEL ANALYSIS

Informal institutions

Paradigms

In the presently dominant policy approach towards pesticides, i.e. combining CAC-instruments (bans, quota, fines for illegal use) with suasive instruments (such as covenants with target groups for further reduction of pesticide use), the dominant policy paradigm is that based on the standard polluter pays principle (SPPP). As was mentioned before, centralistic EIs giving a negative incentive are usually based on the extended polluter pays principle (EPPP), except when the design of the instrument includes special provisions, such as a tax free base. These instruments were popular in the 1990s, when cabinets were in power that wanted to be a front-runner in environmental policy. The present cabinet is not as environmentally ambitious as the ones in the 1990s (especially the cabinets of Kok I and Kok II). The difference in man-nature paradigms, reflected in the type of polluter pays principle, may be exactly the reason for the present general unpopularity of EIs among target groups and their political representatives. Covenants, which imply an interactive and more hidden policymaking process, stand a higher chance of target group support, and as a consequence a higher chance of success. As a result, in the end, they may even prove to be more environmentally effective than a policy based on the EPPP (reflected in centralistic EIs), at least for the current phase of environmental policy and protection.

Culture

Problem ownership and burden of proof

Present agricultural policy is based on a system in which agricultural entrepreneurs are granted a right to pollute up to a certain level. This right has evolved over decades, and has therefore been claimed and thusfar fiercely defended by the agricultural sector. This right is reflected in the dominance of the SPPP in policy addressing pollution from agriculture. This

historically grown and insititutionalised right to pollute makes it hard to change agricultural practices towards more environmentally benign ones (see also Dietz, 2000). A factor adding to this situation is that the burden of proof of environmental offence at present lies with the government. Since agricultural practices are widespread and diverse, monitoring all activities would require enormous monitoring costs and efforts. Therefore, sensitivity to fraud is rather high. This is a general problem in addressing diffuse pollution, not just related to agriculture. Reversing the burden of proof to the agricultural entrepreneur, combined with rewarding entrepreneurs that have a better than standard environmental performance ('stick and carrot'-mechanisms), is likely to save government authorities substantial amounts of monitoring costs and is likely to improve awareness and 'incorporation' (*verinnerlijking*¹⁹²) of sustainable behavior and to provide an incentive for innovation. In theory, economic instruments can generate the necessary financial resources via the 'stick-mechanism' to give positive incentives to target groups (the 'carrot-mechanism'). The compensation of target groups for increased monitoring efforts and costs would be a point of attention with respect to reversing the burden of proof.

Changes in agriculture

At the same time, a slow change (macro-level trend) towards sustainable agriculture can be identified. In the past, initiatives for innovations towards sustainable agriculture predominantly came from government authorities, scientific institutes and environmental NGOs. However, since (under pressure of society, politics and science) the agricultural sector is slowly getting convinced of the necessity to make a transition towards sustainable agriculture, agricultural representative organisations nowadays also act as initiators of innovative production approaches. This is a step towards 'incorporation' of environmental concerns, as mentioned above. Motives for such initiatives, besides aforementioned pressure, may be business opportunities, creating a sustainable image and thus good will in the societal and political arena, and the prevention of government interference (command and control). Policy making use of suasive instruments (such as covenants about the conversion to sustainable agriculture) and positive incentives (such as subsidy and support programmes) may be regarded by agriculture and its representative organisations as doing more justice to this changing attitude. However, positive incentives cost the government financial resources, while negative incentives yield financial resources, and thus such an approach would create a financing issue.

Formal institutions

Policy

Occasions for the instruments

The pesticide tax in The Netherlands has been studied within the framework of the *WBM* (*Wet Belasting op Milieugrondslag*; Framework act regarding levies on environmental grounds). The mineral tax is the result of increasingly tight emission standards at both the national and EU-level. A fertiliser tax for The Netherlands has been studied within the same

¹⁹² *Verinnerlijking* is a term introduced by a former Minister for the Environment (Winsemius), referring to a paradigm shift among target groups of environmental policy leading them to incorporate environmental concern into their practices and take a pro-active position with regard to environmental protection, which would reduce the need to direct environmental policy at these target groups.

framework of tightening environmental standards. The occasion for studying the possibilities of agricultural levies based on the Surface water pollution act was a number of studies about financing water management within the framework of the preparations for *NW4*. So all studies were performed in preparation or as a result of the introduction of a formal institution at various levels, be it a white paper or a law.

Legal framework

EU-regulations on competition and government support are often an obstacle for generalistic environmental economic policy instruments at the national level that differ from EU-approaches. Pesticide use, for example, is regulated at EU level by Council Directive 91/414/EEC. According to an interviewee at the Ministry of *LNV*, this directive may allow for a pesticide tax, but the rebate of tax revenues to target groups, which is often a precondition for target group support, has to meet EU regulations about government support to domestic economic sectors. This has proved to be a major obstacle for several proposed schemes. Besides requirements with regard to competition and government support, national schemes may also be obstructed because of a lack of concordance with EU-schemes addressing the issue itself. For example, the MINAS-system was rejected by the EU, who based its policy on a standardised system with maximum loads of minerals per hectare, and maximum amounts of emissions (f.e. for nitrate) per country, enforced via (very) high penalties for member states. Such a system does not allow for levies on emissions. Therefore, in this case, EU-regulations aiming at standardised (CAC) instruments prevent the application of a sophisticated economic steering instrument.

The study regarding a *WVO*-levy for agriculture proved to be legally feasible at the national level, but this levy would be complicated in nature. A levy on (actual) emissions would require certainty about the cause-effect relationship and (*ex ante*) information on price-elasticity. Besides, this levy is difficult and costly to monitor and control. Besides, it addresses only emissions to water, and not to soil or air. As such, it would not qualify as an integrated levy. Finally, such a levy would have to comply with EU-regulations about competition and government support as well.

Guidelines and standardisation

Various studies have been performed on the possibility of introducing levies on input materials for or emissions from agricultural practices. One strong precondition for such levies from the perspective of target group acceptance was that (a major part of) the revenue would be somehow redirected to the target group. This proved to be a major obstacle, since such a rebate is subject to EU-regulations on government support to economic sectors (see above). Therefore, rebate would only be allowed to stimulate specific enterprises or activities in the agricultural sector, from the perspective of restructuring agriculture towards sustainability. In order for this to be possible, a standardisation would have to be made of sustainable practices. This proved to be a very complicated task for main stream agriculture. Both proponents and opponents agreed at the time that it was technically and institutionally impossible to certify single activities or production systems within otherwise regular enterprises. The only activities that could be certified (and would thus be eligible for such a rebate) were completely biological enterprises, since these enterprises could be certified as a whole. According to a policy officer of the Ministry of *LNV*, if it wasn't for the aspect of revenue rebate, a pesticide tax would have already been introduced in the 1990s, because

there was political will and agreement on principle between the parties involved on all other aspects. According to a policy officer at the Ministry of VROM, however, if the minister for the environment at the time (Pronk) would have had sufficient political mandate (and thus power), this obstacle could have been overcome.

EU-wide framework

EU DG-XI (the directorate general for the environment) considered it desirable to investigate the advantages and disadvantages of an EU-wide framework for pesticide levies. Such an EU-wide framework could also be regarded as a kind of standardisation of policy. Because of the problems involved in implementing the council directive on pesticide admission, a need was felt for additional measures in order to achieve the ambitious goals set in the Fourth Environmental Action Program. Besides, a need was felt to harmonise the EU internal market. Introduction of an EU-wide framework for levies on pesticides would take away the argument of competitive disadvantage and fraud across member state borders. However, as turned out from the research, such a system would be beset by insurmountable technical and political difficulties, amongst others because of the pervasive uncertainties about the dose-effect relationships of pesticides and the environmental effectiveness of economic instruments addressing pesticide use. So whereas a national scheme was blocked by regulations at EU-level, an EU-wide scheme was impeded by a lack of scientific knowledge, feeding all three levels of discourse and resulting in a lack of consensus.

Actors, coalitions and motives

Arenas

With regard to pesticide policy, a coalition exists in the societal arena between citizens, environmental NGOs and representative organisations of consumers. Environmental NGOs call for stringent pesticide policy from an environmental point of view, while consumer representative organisations call for this from the point of view of food safety. Individual citizens may be concerned about pesticides from both perspectives. Such a coalition is not likely to exist for the issue of mineral surpluses, since in this issue, food safety is not a concern. Therefore, representative organisations of citizens (in this case mainly environmental and nature NGOs) mainly address the environmental aspect. Because of the direct threat to human health from pesticides, there is a strong lobby from the societal arena to reduce pesticide use. The eutrophication of water systems by mineral surpluses from agriculture is a less directly threatening, more creeping environmental problem which receives less attention in the societal arena. This debate predominantly takes place in the scientific and political arena. A phenomenon being regarded as an issue in the societal arena may act as an important factor for stimulating the formulation and implementation of policy for the issue. Thus, from this perspective, advanced policy measures may be more readily expected with regard to pesticides than with regard to mineral surpluses.

Target groups and representative organisation(s)

The target group of the instruments studied (businesses in agriculture and horticulture) generally object to any levy, since these instruments are expected to increase the administrative and financial burden on the business and thus affect its economic and competitive position. This target group is well organised and well represented, which makes it a strong actor in negotiations, since they are effective in mobilising various types of

resources to exert power in the decision-making process (such as discourse, protests, financial resources and economic power). The sector seems to be rather homogeneous, which would facilitate a tailor-made design of centralistic economic policy instruments. However, location specific characteristics and differences in (combinations of) activities and specialisation make the sector more heterogeneous than expected on first sight. The target group of policy uses these differences to object to various initiatives for centralistic economic instruments.

Discourses

Ontological discourse

The dominant ontological discourse in all arenas (the political, administrative, societal and scientific) at present is that agriculture is still causing too much pollution of the environment. This discourse is represented by DG Environment of the European Union, environmentally oriented politicians and public administrators at the national level (mainly from the Ministry of VROM), ecologically oriented scientists and environmental and nature NGOs. The alternative discourse is that agriculture is doing enough to reduce environmental pollution already and that agriculture is severely suffering from environmental policy. This discourse is represented by the agricultural sector itself, its representative organisations, the industry depending on it, political actors representing the sector and 'agriculture oriented' public administrators. If EU-regulations had not supported the institutionalisation of the discourse of 'still too much pollution by agriculture', this alternative discourse might have been dominant in policymaking in The Netherlands. The reason that pollution by agriculture has been tolerated for a long time is that (modern) agriculture was regarded as one of the main 'motors' of the Dutch economy. In recent years, however, other economic sectors, mainly services and knowledge-based sectors, are increasingly considered as motors of the economy, and the relative importance of the agricultural sectors is considered to be decreasing. As a consequence, rural areas are assigned different functions (such as recreation for employees in the service and 'knowledge' sectors, and nature), which requires assigning a different function to water systems as well. As a consequence, the question which level of pollution of water systems by agriculture (and other sources of pollution) is allowed, is being redefined, leading to higher ecological ambitions and thus stricter standards (which encompasses a change in property rights). Trends in society may thus lead to a shift in ontological discourse, eventually resulting in changing policy and institutions.

Normative discourse

As was discussed before, the normative discourse regarding environmental policy has shifted in recent years from a pro-active, environmental front-runner discourse to a more conservative discourse following EU-regulations. A dominant story line in this conservative discourse is that being an environmental front-runner weakens the competitive position of the Dutch agricultural industry in the EU-internal market. On the other hand, pressure from the societal, political (especially EU) and scientific arenas to change the present (bio-industrial) agricultural production system because of its alleged excessive negative externalities (amongst others manifested via swine fever, fowl plague, mad cow disease and negative environmental effects) is forcing primary politicians (such as the minister of LNV) to stimulate a transition towards more sustainable agriculture. It can be concluded from the data that actors that were part of the previously dominant arrangement supporting

modernist agriculture attempt to adapt the discourse about sustainability to their existing production system and to fit it into the existing institutional framework.

Strategic discourse

Opponents of environmental EIs for agriculture stress the financial and administrative burden of these instruments on the target groups (related to the fairness criterion), the sensitivity for fraud, the uncertainty regarding the exact nature of the mechanisms linking agricultural activities and negative environmental impacts (environmental effect) and the uncertainty regarding the link between EIs and the reduction of this pollution (environmental effectiveness). Besides, opponents argue that a switch to bio-organic agriculture will marginalise the Dutch agricultural sector, which has gained an internationally important position exactly because of the production systems criticised for their unsustainability. The actor-coalition of this story line has been rather successful so far in preventing the introduction of EIs in environmental policy towards agriculture and radical shifts in production systems. However, examples of pesticide taxes in other EU-member states show that the first three of these objections can be overcome in several ways by an intelligent design. Advocates of economic policy instruments emphasise the positive effect of a dynamic incentive for the transition towards sustainable agriculture and the positive effect of a sustainable image of the agricultural sector for the sales of agricultural products on the EU-internal market. This was an important argument for Swedish farmers to accept a pesticide levy, which was combined with a rebate of the revenues to sustainable agricultural practices. The issue of price elasticity is a more fundamental problem, which to a large extent is an exogenous factor, which can probably only be influenced by suasive instruments (debate, education and communication).

Power and resources

Farmers and representative organisations mainly use the economic power of the sector and story lines to influence decision-making. Central in the discourse is the argument that agriculture is already kept on a tight leash and that (even) more stringent environmental regulation would marginalise the contribution of agriculture to the Dutch economy and the position of Dutch agriculture in international food markets. Besides, both the relation between the use of pesticides and fertilisers and (the gravity of negative) effects on the environment and the environmental effectiveness of centralistic instruments is fiercely debated.

Environmental NGOs mainly use discourse, scientific data, media-attention and public actions (societal agenda setting) as their resources to influence political decision-making. With regard to societal agenda setting, these organisations have a stronger resource for pesticide policy than for mineral policy, because of the already mentioned coalition between environmental NGOs and consumer organisations. Story lines focus on the argument that although agriculture has in the past few decades been subject to increasingly stringent environmental regulation, this sector continues to pollute the environment, with negative effects on both humans and the environment. So whereas the 'agricultural' discourse-coalition argues that external effects of agriculture have been internalised sufficiently, or deny the existence of remaining externalities at all, environmental NGOs argue this is not sufficient yet.

In centralistic arrangements, the national government uses its democratic mandate to influence environmental policy. The top-down character of these arrangements is one of the main arguments of opponents to oppose to centralistic instruments. Since the target group is a well organised and powerful group of actors, it is hard to implement and enforce any instruments these actors strongly oppose to. This probably accounts for the fact that in current environmental policy for the agricultural sector, the emphasis is on suasive instruments, consensus building and joint policymaking.

MICRO-LEVEL ANALYSIS

Technical criteria

Environmental effectiveness

As showed from the examples discussed, the environmental effectiveness of centralistic economic environmental instruments for addressing diffuse pollution by agriculture has been seriously undermined in several EU-member states because of technical and political obstacles. In most cases, stakeholders' (mainly target groups) objections have led to technical adaptations, which have compromised the environmental effectiveness of the instrument. Examples of such adaptations are exemptions of important target groups because of protests or administrative difficulties and the setting of a rate at which hardly any regulative effect occurs.

According to an interviewee, in theory it is possible to design a levy that takes the edge off counter-arguments (for example by a rebate of revenues to the target groups) and as a result avoid strongly compromising arrangements. The combination of a substantial tax and rebate of revenues in the form of education and training and technical measures led to a decrease in pesticide use in Sweden and Denmark of about 35 to 40% in a decade. However, such a design is unlikely to pass the concordance test at both the EU- and the Dutch national level. At EU-level, such an arrangement is likely to conflict with regulations for government support to economic sectors. Rebate of levy revenues to the target group is only allowed by the EU if it fits EU policy for agriculture, such as a shift towards sustainable agriculture, which has to be certified first. This proved to be a complicated matter. At the national level a rebate of revenues may conflict with general rules for the tax-system, which stipulate in which way these revenues may be applied.

Environmental and economic efficiency

The overall environmental and economic efficiency (i.e. at the level of society as a whole) of various policy instruments is beset by substantial uncertainties. These uncertainties relate to a substantial set of issues, such as problems with valuation of (both positive and negative) effects of the use of substances addressed, lack of information about the efficiency of current use of the substances, the exact effects (on the environment, the economy and society as a whole) of interventions through policy instruments and the exact administrative, monitoring and enforcement costs of the instruments.

An argument used by advocates of centralistic economic steering instruments in agriculture is that these instruments can help farmers improve their economic efficiency by optimising the use of inputs into the production process (the 'pollution prevention pays'-argument). This

argument was used in some EU countries to convince the target group (i.e. farmers) that environmental economic instrument need not have (exclusively) negative effects.

Dynamic incentive

In principle, all centralistic economic steering instruments provide a dynamic incentive, since they are based on the extended polluter pays principle. Besides, the rebate of revenues in the form of training, education or subsidies for sustainable agriculture can also lead to a positive dynamic incentive. This way, a double dynamic incentive can be achieved, as in the case of the pesticide tax in Sweden. However, technical and institutional adaptations (as a result of the pressure of actor coalitions) often lead to a distortion of the 'pure regulating taxes', which (strongly) compromise the dynamic incentive. Examples of institutional adaptations are the exemption of a number of economic sectors in the case of the Belgian pesticide tax, which resulted in a *de facto* exemption of all relevant sectors, and the EU regulations on competition and state support, making the rebate of revenues to target groups (in whatever form) very difficult. As a consequence of these compromising adaptations, target groups receive an incentive to innovate their production processes only up to a certain point, or don't receive an incentive at all.

Perverse incentives

In general, taxes on input materials of agricultural production processes are more prone to perverse incentives and undesirable side-effects than taxes on emissions. For example, taxes on (certain) pesticides in some countries are expected to lead to moving agricultural production to countries with less stringent pesticide policies, or to the use of older pesticides, which were not included in the list. These concerns were for example expressed by Danish farmers in case of a unilateral introduction of a pesticide tax in that country. These undesirable side-effects are facilitated by the fact that volumes of pesticides needed are relatively small, which facilitates smuggling and fraud. These perverse incentives are avoided in case of taxes on emissions instead of input materials. However, actual emissions in general are hard and costly to assess accurately.

Simplicity and specificity

The simplicity criterion is a serious obstacle for a tax on pesticide use. This group of substances is very heterogeneous. Each substance has a different dose-effect relationship and may have different mechanisms through which they affect ecosystem-functioning. Therefore, to be fair from a PPP-point of view, the tax ought to be differentiated according to (categories of) substance(s). This, however, is a very complicated task beset with substantial uncertainties and therefore this activity provides ample room for discourse. Besides, very sophisticated instruments, because of a larger number of rules for the market, compromise on proper (i.e. competitive) market allocation and bring along high perception costs. For fertilisers, this criterion is less of an issue, since these substances are more homogeneous in nature and it is relatively easy to establish the mineral content of various fertilisers.

Fairness/impact

From the point of view of fairness and impact, rebate of tax revenues to the target group and the height of the rate are crucial preconditions for target group support. Because of the latter, the price-elasticity is a crucial factor for environmental effectiveness and successful implementation. Only if price-elasticity is substantial, the tax rate can remain relatively low

and as a consequence target group support may be established. If price-elasticity is low, a high tax rate will have to be installed to obtain a regulative effect, and target groups will object from the point of view of fairness. This story line is strongly brought forward by target groups of both pesticide and fertiliser taxes, since for both substances, price elasticity is relatively low¹⁹³. Despite the low price-elasticity of pesticide use, studies on implemented pesticide taxes showed that the rate of the tax had a limited financial impact on the target group (farmers), because the contribution of pesticide use and the additional tax to total production costs for the enterprise was relatively low. The same can be concluded for the impact of the tax on the competitive position of domestic agriculture.

The mineral tax on emissions within the MINAS-system in The Netherlands ensures a close relationship between the tax and emissions to the environment. The instrument is specific and thus fair from the polluter pays perspective. Besides, scientific studies showed that 41% of the farmers affected could reduce their production costs by more efficient mineral use. Keeping this in mind, the financial impact on agricultural enterprise can be considered limited, and thus fair as well. The mineral tax within the MINAS-system thus scores high with regard to the fairness criterion. However, as was discussed before, the system does not pass the concordance criterion, especially with regard to the dominant normative discourse at EU-level regarding fertiliser policy.

Intentionality

All levies studied in this section have as primary objective a regulating effect to curb emissions to the environment. Secondary purposes are the greening of the tax system and revenue raising, either for covering administrative and perception costs or for the general state budget. Product taxes on materials and substances before consumption tend to be questioned more with regard to their true intention (either revenue raising or regulative effect) than emission taxes, because with the former, the link between the tax base and the environmental effect is often quite indirect. It may reduce the demand for certain substances, but it does not give an incentive to change the application practices of the substances. Most pesticide and fertiliser levies discussed in this section are product levies, while the mineral levy within the MINAS-system is a levy on true mineral emissions, and therefore more accurate from a regulative point of view.

The same type of concern as expressed with regard to product taxes counts for standardised taxes as opposed to taxes on actual emissions. Standardised taxes do not provide a dynamic incentive to change production practices and therefore, the regulative effect is likely to be limited. However, measurement of actual emissions of diffuse pollution from agriculture is complicated and therefore costly and labor intensive. As such, this activity will compromise on the efficiency of the instrument. In various studies, it was concluded that taxes on actual emissions of minerals and pesticides were too complicated. For example, in the study by LEI-DLO and DHV (1996), it was concluded that a WVO-levy on actual emissions was too complicated for pesticides, and therefore, a standardised levy was proposed. Such a levy, however, is likely to be heavily debated with regard to intentionality.

¹⁹³ For both, a price elasticity is of between zero and -0,5. For a calculation of the price-elasticity of pesticide use, see the example of Sweden earlier this section. For a calculation of the price-elasticity of nitrogen use (in Denmark), see for example Hansen (2001).

Rebate of revenue

As was mentioned before, involving the schemes for a rebate of revenue through well developed programmes of training, technical measures and stimulation of sustainable agriculture led to a broad support of environmental levies on agricultural activities in Scandinavian countries by the target groups. However, with an increasingly stringent EU-policy on internal market competition and government support, such schemes have become hard to implement nowadays. These EU-regulations may even lead to the repeal of the Scandinavian schemes, despite their success in stimulating the transition towards sustainable agriculture, especially through the rebate scheme.

Chance of fraud

Some levies stand a higher chance of fraud than others. With regard to mineral and pesticide use, opportunities for fraud are quite simply determined by the volume of the substances. Pesticide quantities needed are smaller in volume, and can therefore be more easily smuggled from abroad. Besides, transport costs are much lower. Possibilities for fraud, and thus the frustration of a tax scheme, are thus bigger with regard to pesticides than with regard to fertilisers.

Political criteria*Equity*

At present, water quality management, including activities to mitigate the effects of agriculture on the aquatic environment, is paid mainly by industry and citizens (*ingezetenen*) (see LEI-DLO and DHV, 1996). As such, industry and citizens indirectly subsidise agriculture. For example, present pesticide policy (admission of pesticides, education and training) is largely financed by general means (i.e. by the tax payer). Besides, the external costs of pesticide concentrations in water systems are transferred to consumers of drinking water, via higher purification costs. This financing mechanism is not in line with the polluter pays principle. The consequence is that actor groups are paying for water quality management that do (in a general sense) benefit from this management, but that are not the causers of the management costs. In this case, the PPP should have priority over the benefit principle, since the PPP is a more specific, better targeted principle. Taking the PPP as a starting point, it can therefore be concluded that the present policy approach is not equitable. According to an interviewee at the Ministry of Agriculture, Nature management and Food quality (*LNV*), this does not need to be a serious problem as long as present environmental policy is effective in further reducing the burden of agricultural activities on the environment. If policy is effective, this burden will be reduced, and the costs for water quality management will reduce as well. However, the fact remains that in this situation, actor-groups that are not the (direct) causers of the water pollution are paying for water quality management. Indirectly, they may be, since citizens, via their consumption patterns, help sustain unsustainable agricultural production practices. This relationship, however, is not one on one and the present system also affects actors that do not help sustain these practices (those that buy more sustainable agricultural products).

One of the factors that help sustain cross-subsidising is that the common tax payer is generally not well organised and represented. Besides, because of its heterogeneity, interests of this actor-group are dispersed, which makes it difficult to mobilise this group. As

a consequence, this group does not have the power needed to change the financing system. The fact that this actor group is not well organised and does not possess powerful resources, makes it an 'easy target' to carry the burden of financing public policy. As long as the government does not base the financing system for water quality management on the EPPP, this government, who's main task it is to represent the general interest, does not represent the general interests of the tax payer. Besides, the 'common tax payer' may be ignorant of the situation described above, or indifferent, because at present, water management costs are low relative to the costs of other public utilities. This situation may change if and when the height of water-related prices, taxes and charges are based on actual water use and pollution (via the '*waterspoor*' (see earlier this chapter and chapter 4)), and when the costs of water management are more purely allocated to the cost causers (i.e. more purely based on the polluter/user pays principle or the (direct) benefit principle).

Sustainability

The Scandinavian tax schemes presented in this chapter in general score high on the sustainability-criterion. Not only do they (intend to) have a regulative effect on emissions of harmful substances to the environment, but because of the rebate system, they also stimulate the transition of the agricultural sector into a sustainable one, keeping in mind economic and social feasibility. Since the dominant discourse about the sustainability criterion includes the ecological, social and economic dimension, these schemes score well on overall sustainability.

Concordance

As was discussed in the part about the legal framework, many tax schemes proposed at the national level were not in concordance with EU regulations on competition and government support with regard to the rebate of tax-revenues to the target groups. Besides, the MINAS system was not in concordance with the strategic discourse at EU-level, which is in favour of CAC-instruments. A *WVO*-levy for agriculture did not fit the dominant normative discourse at the national level regarding integrated approaches to pollution. From the examples discussed in this chapter it can be concluded that (lack of) concordance is often an important criterion on the basis of which initiatives for centralistic economic steering instruments are turned down. With the presently dominant mix of CAC-instruments and SIs, EIs are not likely to be introduced in this economic sector.

SUMMARY OF ECONOMIC STEERING INSTRUMENTS FOR DIFFUSE POLLUTION FROM AGRICULTURE

(Potential) stimulating and obstructing factors

Stringent EU-regulations stimulate far-reaching environmental policy measures for mineral use in agriculture. At the same time, however, EU-regulations (both the Nitrate-directive and regulations for competition and government support) are a major obstruction for the introduction of a truly regulative environmental tax in The Netherlands (the tax within the *MINAS*-system). EU-regulations regarding government support and competition in the internal (EU-) market hinder the introduction of instruments at the national level that are based on starting points or mechanisms that differ from the ones envisioned at the EU-level. Regulations regarding market competition only allow for rebate of revenue under very

specific circumstances. Certification and standardisation of sustainable agriculture would facilitate judgment by the EU in this respect and would improve options for revenue rebate. This, however, proved to be a far from easy task. According to an interviewee, the chance of success for centralistic regulative economic instruments for environmental policy also depends strongly on the administration in charge. He stated that in case of a strong will and powerful political movement towards these instruments, many, if not all, technical, institutional and political obstacles can be surmounted.

6.4.6 DECENTRALISED INSTRUMENTS FOR DIFFUSE POLLUTION FROM AGRICULTURE

BLUE SERVICES FOR WATER QUALITY MANAGEMENT

In chapter 5, blue service-arrangements were discussed from the perspective of water quantity management. Although in Dutch water policy these arrangements are mainly suggested for water quantity measures, they can in principle also be applied for water quality management, or for combined (integrated) water quantity and quality management. Blue services for water quality management often overlap with 'green services', which have been applied for some time in nature management already. An example of an application of blue services for water quality management is a stipulation of soil use in areas where groundwater is used for the preparation of drinking water, or in bufferzones around (key) nature areas. For example, government authorities can set requirements for the use of pesticides and fertilisers according to higher standards for the protection of ground water. As a consequence, farmers in the ground water protection area may incur a reduced production yield because of the stricter regulations, which is then compensated for by water managers (in this case the water company).

Informal institutions

Problem ownership

Whether farmers that reduce the load of pesticides and fertilisers are compensated by public authorities or whether farmers that exceed the maximum amount allowed are fined, depends on the problem-ownership, which is based on formal and informal institutions. Some may say the farmers are the problem owners, because they are the polluters, others may say they are not, since they were forced in the past by society to specialise and overproduce. The answer to the question who is the problem owner, is usually determined by the rules about pollution (pollution standards), laid down in formal public documents. According to these rules, those private actors that exceed the pollution standards should be fined, while those private actors that take extra efforts to reduce pollution (further than the maximum allowed concentration or load), should receive a payment for these extra efforts. This latter situation is the starting point of blue service-arrangements. An important institution in determining what are normal efforts by farmers with regard to the environment and what are considered extra efforts, is the 'good agricultural practice' (*GLP, goede landbouw-praktijk*). The GLP is a guideline initiated by the EU and elaborated for its Member States, in a consensus between government and agricultural representative organisations (see below).

Formal institutions

Guidelines and standardisation

Good agricultural practice stipulates which activities (such as environmental concern/protection) may be reasonably expected in normal agricultural enterprise, and which activities may be labelled special activities. In other words, 'good agricultural practice' is a minimum quality standard for agricultural enterprise. Under the EC Nitrates Directive (91/676/EEC) EU Member States have an obligation to produce and promote Codes of Good Agricultural Practice¹⁹⁴ as a means of providing all waters with a general level of protection against nitrate pollution. These qualifications may have consequences for the types of regulations applying to the blue service and therefore for acceptance of the arrangement, especially at EU-level. For example, whether or not an activity meets the qualification of 'good agricultural practice' determines whether or not the EU regards the payment of the blue service as (illegal) state support. Another important type of standard for agricultural enterprise are quality demands in the product chain of agricultural products. These standards may also have consequences for the types of water services that can be offered or the type of agricultural products that can be combined with blue services.

Strategic discourse

Story lines about possible arrangements

According to participants of a workshop on blue services held by *DLV Groen & Ruimte*¹⁹⁵ in 2004 (see Bleumink, 2004), blue service-arrangements are especially suitable for water quality measures. One reason for this is that water quality measures, in contrast to water quantity measures, are more easily taken at the level of one patch of land. This characteristic makes it easier to make agreements with single landowners compared to water quantity measures. Therefore, it is easier to meet the condition of voluntariness and the risk of failure is lower, since there is no risk of one farmer rejecting a collective agreement. Examples of extra water quality measures that could be arranged via blue services are agreements about the (further) reduction of the emission of minerals and pesticides. According to Bleumink, especially in water storage areas, the reduction of mineral use is important, in order to reduce the risk of mineral losses during peak storage. In such a situation, the semi-voluntary collective agreement for water quantity measures may be combined with an additional, voluntary blue service agreement for environmentally conscious (water quality related) management. An example of a (potentially) feasible combination of measures for both water quality and quantity management is the protection of water quality for nature combined with a higher water level (to fight desiccation) or more water level fluctuation (to increase water reserves, or to create a more natural environment for the development of a healthy ecosystem)¹⁹⁶. However, it must be noted that measures for water

¹⁹⁴ Source: http://www.ruralni.gov.uk/environment/countryside/Codes_of_Good_Agriculture_Practice/.

¹⁹⁵ *DLV* stands for *Dienst Landbouwkundige Voorlichting* (Service for Agricultural Advice). This institution used to be part of the Ministerie of *LNV* and is now a privatized consultancy. The department *Groen & ruimte* (green and space) of *DLV* gives advice about various aspects of rural spatial planning and development.

¹⁹⁶ It must be noted that non-standard contracts are not exclusively reserved for agreements between public and private parties. They may also be settled between two or more private parties. An example of

quality and water quantity management may not always match, such as in the case of combining blue services for a good water quality (for example for a nature area) with water storage involving water with an inferior quality.

Other envisioned integrated approaches are the combination of green and blue services. With regard to the combination of these types of services, however, it is not yet clear who should be the initiator. According to a spokesman of a water board, water boards are not the right organisation for this, since water boards are primarily responsible for water management (see Bleumink, 2004: 18). Therefore, he does not regard realising an integrated agreement for landscape, nature, broadening of agricultural activities with green-blue services and land consolidation (*ruilverkaveling*) the task of water boards. Provinces may be the right public institution to initiate and organise such arrangements.

6.5 CENTRALISTIC INSTRUMENTS FOR OTHER SOURCES OF DIFFUSE POLLUTION

6.5.1 INTRODUCTION

In this section, a number of centralistic economic instruments are discussed that address diffuse pollution of the environment, including water systems, originating from other sources than agriculture. Many of these instruments have been considered or implemented within the framework of the Environmental Taxes Act (*Wet Belasting op Milieugrondslag*). Instruments analysed include both negative and (related) positive financial incentives. The ones with a negative incentive include product and emission charges, the ones with a positive incentive amongst others include soft loans and tax deductions. The instruments discussed in this section are more or less directly related to diffuse pollution of water systems. Examples of such instruments are energy tax, excise on diesel fuel, stimulation of bio-diesel, tax on lubricants and positive incentives for sustainable building. These instruments will be described in a joint manner.

6.5.2 ELEMENTS OF THE ANALYTICAL FRAMEWORK

MACRO-LEVEL ANALYSIS

Many of the macro-level developments influencing policy for non-agricultural sources of diffuse pollution are similar to the ones influencing policy for agricultural sources of pollution. Important developments at this level are internationalisation and deregulation of governance, ecological modernisation and the emergence of post-material values and scientification. The internationalisation of governance has led to the development of

such a contract, related to water pollution by agriculture, is an agreement between landowners/farmers in a drinking water protection area and the drinking water company using the groundwater. Again, the matter of problem ownership would have to be dealt with and the amount of compensation for compliance or punishment for violation of the stipulation settled by an arbitration mechanism. The legal framework is a decisive factor in determining who should compensate whom.

stringent standards at EU-level, accompanied by high penalties. The threat of these high penalties for not reaching environmental goals has resulted in extra policy efforts by member states to address diffuse pollution. Within this context of taking additional measures, the strategy of greening the tax system has received renewed attention. In the 1990s, this strategy resulted in the implementation of a number of green taxes, but at the same time, a large number of other proposals was not implemented. In the early 2000s, a new study was performed to consider additional possibilities for green taxes to complement the existing set of measures to reduce diffuse pollution (Werkgroep vergroening van het fiscale stelsel II, 2000).

The trend towards deregulation encompasses both decentralisation and privatisation. Decentralisation has caused a tendency towards suasive instruments, such as covenants with economic sectors, backed up by CAC-instruments, and possibly decentralised economic instruments giving a positive incentive. These arrangements of SIs and positive stimuli, backed up by CACs, at present are the dominant strategic discourse for the abatement of diffuse pollution at the national level. However, the stringent regulations at EU-level force the national government to consider all possible strategies in this respect. Privatisation encompasses both the privatisation of formerly public organisations and the privatisation of formerly public goods and services. So far, the former type is mainly related to the water chain and is not addressed in this thesis. The latter type relates to the shift in discourse from viewing 'water as a condition' (provided by public authorities to private activities) to 'water as a service' or water as a product' (provided by anyone to anyone, depending on the property rights). This type is discussed throughout this thesis.

Ecological modernisation refers to a slow transition towards cleaner systems of production and consumption. In industry, and especially the chemical industry, attention for the environment has increased substantially in the last few decades. In the 1990s, the phenomenon of environmental annual reports emerged and larger companies started to create positions for environmental co-ordinators. In recent years, attention has shifted somewhat from the environmental aspect of sustainability ('planet') to the social aspect ('people'). An indication of this shift is the fact that the concept of 'Environmental management' has been replaced by the concept of 'Corporate Social Responsibility' (CSR). Regardless of the name, these initiatives indicate that industries are developing strategies to deal with the environmental and socio-economic impact they cause and with public authorities who represent the environment. Such a pro-active position of companies suits a policy in which these companies are given the opportunity to reduce their environmental burden by themselves. Theoretically speaking, EIs do leave the freedom of choice to business, but SIs do even more so. At the moment, SIs, such as covenants with industrial sectors, are the most popular strategies in environmental policy.

Scientification refers to the situation in which society increasingly depends on (quantitative) science to get information about all kinds of societal developments, including environmental impacts of human activities. This dependence on science partly results from the increasing complexity of production systems, products, their pollution mechanisms and their impacts on the environment. Whereas point sources of pollution were still relatively simple with regard to the latter two aspects, diffuse sources of pollution are usually complex with regard to all four aspects. Since diffuse pollution often shows a great variety of pollution mechanisms

(routes via which they end up in the environment), it will be too complex a task to make specific regulations for each individual mechanism. Therefore, the most feasible strategy is likely to be to deploy instruments that aim at the reduction of the use of the substance itself. Theoretically speaking, economic steering instruments for environmental policy are suitable for executing this strategy. This may be a reason for the fact that this type of instruments is often considered with regard to diffuse pollution, either or not within the framework of 'greening of the tax system'.

MESO-LEVEL ANALYSIS

Institutions

Informal institutions

Policy paradigms

In the present cabinet (Balkenende II), there is clear trade off between economic and environmental/ecological capital. This is a characteristic of the 'environmental protection'-paradigm. In this paradigm, economic growth has priority over environmental concerns, as long as environmental degradation does not clearly and substantially harm the economy. However, policy instruments and evaluation methods used in this paradigm usually do not include all negative environmental effects and positive values of healthy ecosystems in (economic) calculations and decisions. Therefore, the harm done to the environment by the economic system in place is not fully valued. This weakens the position of the environmental capital relative to man-made (economic) capital, leading to a relatively easy substitution of ecological capital by man-made capital.

Environmental goals (such as the Kyoto-protocol, disconnection of economic growth and environmental burden) act as framework-conditions for economic growth, and with the continuation of 'traditional' production and consumption systems, these goals become ever harder to achieve. This shows from frequent reports of the failure to achieve ambitious environmental goals, such as specific reductions of green house gas emissions. Environmental policy in this paradigm for a large part follows the SPPP. It is not the intention to be an international front-runner in environmental policy, but just to practice 'good housekeeping' and abiding by the law. At the same time, however, initiatives are being taken by the cabinet for centralistic economic instruments. According to an interviewee, these initiatives are not only taken because of opportunistic reasons. For example, in the CDA (center right Christian party), which at present is one of the coalition parties, there is (at least in words) a tradition of taking good care of the world. This attitude is referred to as stewardship (*rentmeesterschap*). This for example drives the present Secretary of State, who is a member of the CDA, to propose all kinds of environmental policy initiatives. Despite this, however, in the current political setting proposals for centralistic economic policy instruments in most cases are opportunistic in nature, with the revenue raising characteristic of negative incentives as an important motive. This is likely to be the main reason for the liberal Minister of Finance to favour centralistic EIs. Besides, the minister of VROM (who is a member of the VVD liberal party and who is ultimately responsible for environmental policy in the cabinet), together with a centre right majority in the Lower House, dismiss many of the initiatives in environmental policy.

Political agreements

According to an interviewee, in the yearly negotiations about the state budget, green taxes are sometimes used as trading goods in negotiations about a package of policy measures with a closed financial balance (package deal). Since (environmental) taxes generate money for the state budget, these instruments are popular in these negotiations, since they can help get a sound financing structure for public measures. The majority of increased income from green taxes is rebated via a reduction of income tax and business tax (*vennootschapsbelasting*) and positive incentives in environmental policy. An opportunistic political motive for such a greening of the tax system may be that a reduction of income and business tax is likely to make politicians popular among the electorate.

Formal institutions

Policy principles

All instruments discussed in this section are in principle based on the extended polluter pays principle (EPPP), and thus provide a dynamic incentive for environmental innovations. However, possible adaptations of these instruments to discriminate between situations can result in a less dynamic incentive and an instrument that in fact operates according to the standard polluter pays principle (SPPP). As was discussed in chapter 3, the EPPP is a principle that comes forth from man-nature paradigms that are eco-centric in nature. As such, it can be expected that actors that favour an ecological approach in water policy support centralistic economic instruments and that actors that adhere more anthropocentric man-nature paradigms are in favour of other types of policy instruments. This expectation is confirmed by the general shift from centralistic environmental EIs in the (more ecocentric) cabinets of the 1990s towards the deregulated instruments in the (more anthropocentric) cabinets in the early 2000s.

Legal framework

As was mentioned before, the Environmental Taxes Act (*Wet Belasting op Milieugrondslag, WBM*), issued on 23 december 1994, is an important framework act at the national level for the implementation of environmental levies. This act (both before and after it was introduced) stimulated a large number of studies and initiatives for greening of the tax system. At the international level, the Kyoto-protocol is an important regulation to stimulate reduction of emissions related to issues of global warming and air pollution. At present, at the international (global) level, the issue of climate change (the green house effect) is the dominant issue in environmental policy. As a consequence, initiatives within the framework of the greening of the tax system mainly relate to this policy issue. These initiatives may also lead to a reduction of emissions to the compartment of water, but this effect is indirect in nature, resulting from a general improvement in environmental quality. Besides, as a consequence of shock events related to the policy issue of 'terrorism', environmental issues as a whole do not have a high priority in the international policy arena. As a result of both trends, at present, not many international agreements are made with regard to (fresh) water management and the protection of aquatic ecosystems. The question, however, is whether or not the global level is the right level to address such issues, since the effects of fresh water (eco-system) management are largely confined to river basins.

At EU-level various laws and regulations have been introduced or are being prepared to stimulate member states to take environmental measures. Fines by the EU for not abiding by

their laws are usually quite substantial and are therefore a strong incentive for member states to take adequate measures. Usually, in these laws and regulations, the environmental quality is defined in terms of ambient environmental standards, or in terms of maximum total emissions of a specific substance per EU-member state per year (emission quota). These framework directives leave room to member states to decide how to achieve this goal. Often, a mix of instruments is allowed or even propagated. However, in some special cases (see for example the Nitrate directive), specific stipulations are included regarding the way government authorities are to execute environmental policy. These specific stipulations strongly reduce the range of options for policy instruments available to member states. With regard to the environmental compartment 'water' the WFD was already identified as the most important directive at EU-level. The economic content of this directive was discussed in chapter 4.

Discourses

Normative discourse

Discourse about niche markets and transitions

Economic environmental instruments are sometimes introduced in niche markets for reasons other than overall environmental effectiveness. An example of such an instrument is the tax exemption on bio-fuels in water transport. The ministries of Finance and VROM are usually not in favor of pilots in niche markets, because of their marginal contribution to the overall environmental effect. However, the Lower House can be in favor because of their signaling function, pragmatic considerations and/or a high environmental effectiveness for a specific aspect of the environment (f.e. for water systems). A pragmatic consideration in the case of biofuels was that in the main market on the short term a maximum percentage of bio-fuels of 5% in the fuel mix can be achieved without adapting the engines of all vehicles, while in some niche markets 100% bio-fuel use may be achieved, since the number of engines that needs to be adapted is relatively low. Besides, the infrastructure for fuel supply in niche markets may also be more easily adapted to bio-fuels than that of the main market (road transport). Finally, the introduction of an environmental innovation in a niche market is often regarded as a good strategy to take a first step towards a transition in a complete economic sector.

Strategic discourse

Discourse about point of entry of levy

As showed from the discussion in chapter 4 about environmental levies in EU Member states, The Netherlands do not apply levies on (end-) products as much as some other countries do. An important argument against levies on (end-) products, especially uttered by the Ministry of Finance, is that costs for implementation, monitoring and enforcement and administration are high. According to an interviewee, the strategy to raise levies early in the production chain prevents a highly diversified and fragmented tax system. For this (and other) reason(s), the Dutch national government aims at levies on inputs of production processes, such as raw materials, instead of end-products. A major disadvantage of such an approach is that levies early in the production chain often do not discriminate between various applications of process input, whether environmentally damaging or not (specificity

criterion). As a consequence, the relationship between the levy and the environmental effect may be weak.

Actors, coalitions and motives

Initiators

As showed from interviews with policy officers at the ministry of VROM, various actors can have various motives for either or not initiating or advocating EIs for environmental policy. The interviews showed that it is not necessarily actors adhering environmentally or ecologically oriented paradigms that take the initiative for these instruments. In case other actors, that (may) adhere other, more traditional (antropocentric and economy-oriented) policy paradigms, take the initiative for EIs in environmental policy, the motives for this initiative are usually different and less ideological. For example, the motive for politicians to support green taxes may be the increase in tax burden on environmentally damaging activities in exchange for an alleviation of the tax burden on other tax bases, which may be expected to increase the 'green' image of that politician and/or his popularity for removing another, more unpopular tax.

Supporters and opponents

Target groups

Arguing from a theoretical perspective, it can be expected that 'general tax payers' are in favour of environmental taxes. With environmental taxes, payment occurs according to the user/polluter pays principle. This can be regarded as a fair and just principle from an environmental point of view, since only actors that use (natural) resources or use the waste assimilating capacity of the environment pay taxes. Another argument for general tax payers to support EIs, is that an increase in revenues from environmental taxes in principle leads to a decrease in other, more general taxes. However, as was argued before, the general public and thus 'general tax payers' are usually underrepresented in policy arrangements. This counts for most arrangements with various policy approaches and instruments. Specific taxes are more visible than general taxes, such as income and corporate taxes. Besides, they are directed at activities usually undertaken by specific target groups. As a consequence of their specificity and visibility, target groups of 'special' taxes raise their voice, and usually they do this more loudly, since they are better organised, have more resources at their disposal and have a more specific interest to defend than do general tax payers. Part of the general tax payers will also be (potential) payers of specific taxes, to which they may object. Not surprisingly, specific target groups usually prefer positive financial incentives instead of negative ones. However, positive incentives are paid from other levies, which may not be equitable from the user/polluter pays perspective.

Political and administrative actors

According to an interviewee, the Ministry of VROM does not strongly prefer positive or negative incentives, since the primary criterion for environmental instruments is their environmental effectiveness. With regard to centralistic economic instruments for the environment, VROM in general (from a paradigmatic point of view) is in favor of variabilisation of state budget-raising activities. Levies on the use instead of the possession of natural resources and (potentially) harmful products are considered more equitable (possession is usually less elastic than use) and (environmentally) effective (because of the

dynamic incentive)¹⁹⁷. The Ministry of Finance is usually in favor of negative incentives, because of their revenue raising characteristics. The Ministry of Economic Affairs takes a somewhat dichotomous position, since this ministry represents both vested economic interests and aims at stimulating innovations and a transition towards a sustainable economy.

Temporary commissions

Temporary commissions played an important role in investigating options for greening of the tax system and making an initial judgment about the feasibility of specific instruments, since politicians tend to base their decision with regard to high potential environmental taxes for a large part on these commissions. Two types of commissions played a role in studying options for greening the tax system: external and internal commissions. The external commissions included representatives from science, environmental NGOs, employers, employees and the (central) government. These commissions were composed in such a way as to form a broad representation of societal, economic and political stakeholders. The argument for having such a commission is that unanimous judgement from the commission about the (high) potential of certain instruments almost automatically guarantees (with considerable certainty) a broad support for this instrument in all arenas. Such a commission thus acts as a democratic legitimisation of policy initiatives via an 'open planning process'. The internal, interdepartmental commissions in general were smaller, including politicians and especially civil servants from several ministries (VROM, LNV, Finance, Economic Affairs, V&W). The purpose of these commissions was not to establish broad support in society, but to perform an *ex ante* or *ex post* evaluation of policy instruments suggested by politicians or to be investigated by the external commission.

Power and resources

Some green levies (charges, taxes) are not introduced because actors in the political arena fear heavy protests from well organised and powerful target groups, such as the transport sector in case of an (increase in) excise tax on diesel fuel. Such a tax would raise protests from a large number of actors involved in the transport sector and those depending on it, such as gas stations near the borders, transport business and private users. For example, almost all lease cars are diesel driven. Since these target groups include a substantial part of the country's citizens, politicians fear the loss of votes in the next elections.

As was also observed in the 'case' of the Blauwe Stad (see chapter 5), the ones suffering from a government measure will raise their voice more than the ones benefiting. As such, these parties are also more interesting for media. Besides, the (main) parties benefiting from green taxes are the environment, citizens in general and (non-polluting) tax payers. The environment itself does not raise its voice, and it is not always completely clear who (officially) represents the environment in the debate. The fact that everyone benefits from a healthy environment is too indirect an effect (and thus interest) to weigh heavily in decision-

¹⁹⁷ With regard to some products, it can be questioned whether this is completely true. Some products require substantial amounts of raw materials, water and energy for their production. An analysis of the environmental burden of products during their complete life cycle (Life Cycle Analysis, LCA) could shed more light on the 'environmental burden ratio' of production, use and disposal.

making and to be strongly represented and 'the tax payer' is too heterogeneous a group of actors to be strongly represented. Therefore, the target groups of taxes will usually be more heavily represented in the debate than general interests.

MICRO-LEVEL ANALYSIS

Technical criteria

The interdepartmental task force studying options for greening of the tax system screened alternatives on three main criteria: economic effects (distributional effects, competitive position of economic sectors in the Dutch economy and that of the Dutch economy as a whole internationally), environmental effects and budgetary effects for the state budget. These criteria can (in this situation) thus be regarded as the most important criteria for evaluation, which have to be balanced in order to arrive at an acceptable tax scheme. As was mentioned in the presentation of the actors involved, these criteria are the most important criteria for the Ministries of Economic Affairs (and other Ministries dealing with socio-economic impacts of policymaking), the Ministry of VROM and the Ministry of Finance, respectively. Besides selecting on the environmental effectiveness criterion, the Ministry of VROM aims to apply the PPP as much as possible. An ideal instrument for diffuse pollution would thus be one through which the polluter pays, the environmental goal is achieved and public and stakeholder support is achieved as well, because of limited negative or even positive economic effects. As was mentioned before, public (or rather: target group) support is more likely with positive incentives. However, with positive incentives the polluter doesn't pay. A combination of taxes and rebate of revenues may have the best of both sides.

With regard to some activities, policy instruments can be effective in niche markets, both in terms of curbing total emissions to the environment by this niche market, and in terms of curbing total emissions to a specific compartment of the environment (f.e. emissions to water). However, with regard to most products and types of emissions, the main environmental effects are to come from adaptations in main stream product use or main stream activities. These main markets are usually the best institutionalised and best represented markets, which makes them hardest to change. Introduction of levies in niche markets may 'warm up' the main market for these instruments and the consequences they will have for this main market. Besides, these niche markets act as pilots for implementing the schemes.

6.5.3 CONCLUSION

(POTENTIALLY) STIMULATING AND OBSTRUCTING FACTORS

The discussion of the instruments in this section showed that political ideology can be both an stimulating and obstructing factor for any type of policy instrument, depending on the dominant normative and strategic discourse. In the present political setting, dominant normative discourses do not favour centralistic environmental steering instruments. What counts for political ideology counts for political opportunism as well. The fact that this opportunism can be helpful was demonstrated by the example that instruments for greening

of the tax system may be used as negotiating material in budget negotiations, even by parties that will not take the initiative for these instruments from an ideological point of view.

Besides these national political factors, strict EU-regulations can be regarded as a strong stimulus for environmental policy measures, including economic ones. This counts especially for economic policy measures regarding fossil fuel use and other emissions to air, since the debate on climate change is dominant in international environmental policy. However, most of these substances relevant for climate policy only cause marginal diffuse pollution of water systems. On the other hand, strict EU-regulations about competition and government support decreases the range of options for designing an instrument that is suitable according to all criteria. This especially counts for the rebate of revenues to target groups.

6.6 SUMMARY

In this chapter, policy for water quality management was analysed by using the analytical framework of chapter 3. For this analysis, a distinction was made according to type or mechanism of pollution: point source pollution, diffuse pollution and hazardous waste. The analysis of policy approaches to issues in water quality management showed that no economic approaches are considered or in place for addressing hazardous waste. For both point sources and diffuse sources of pollution, such economic approaches are in place, and additional arrangements are considered. The analysis yielded insight into factors that determine whether or not economic approaches are considered and implemented for water quality management, and what the role and content of such approaches is in the total of policy. In this section, a summary will be given of the findings in this chapter. This summary mainly addresses the overall scope and content of economic approaches in water quality management. In the next chapter, various policy arrangements for water quality management involving economic policy instruments will be compared amongst each other and with arrangements for water quantity management.

6.6.1 SCOPE OF ECONOMIC INSTRUMENTS IN DUTCH WATER QUALITY MANAGEMENT

ECONOMIC INSTRUMENTS FOR WATER QUALITY MANAGEMENT

Compared to other countries, The Netherlands know a substantial number of economic policy instruments directly related to water quality. While most EU- and EEA-countries know only 1 or 2 of such instruments, the OECD listed three of such instruments for The Netherlands, namely the sewage charge, the water effluent charge and the manure charge. However, the reason for sharing the manure charge in the category of 'water taxes and charges' while putting the pesticide charge and fertiliser charge in the category of 'charges on agricultural inputs' by the OECD (1999) remained unclear. The degree to which these instruments have an incentive effect varies. The effluent charge, which is meant for private actors discharging polluted water onto surface water systems, is (as much as possible) based on actual load of polluting substances. This charge therefore gives an incentive to reduce the pollution load. This charge has led to a dramatic decrease in point source pollution since its introduction in

the 1970s. The sewer charge, however, is based on standardised categories. Single person households are charged for a load of polluting substances equivalent to the load produced by one person in one year (*inwoner equivalent*). All other households are charged for three *inwoner equivalenten*, no matter how large the family and no matter their actual pollution load. This charge therefore does not give any incentive to reduce the amount of waste water produced.

6.6.2. ECONOMIC APPROACHES TO POINT SOURCES OF POLLUTION

The waste water levy (effluent charge) is the main levy for point sources of pollution in The Netherlands. This levy was the first levy for water quality management in The Netherlands. Since state support for water quality management was (largely) denied, the levy operates according to the full cost recovery principle. Besides, the height of the levy is based on the pollution load, which makes it a levy operating according to the polluter pays principle. In combination with technical measures and other types of instruments, it has been very succesful in curbing pollution from point sources. As such, the scheme has been an example for many other countries.

The main remaining issue with regard to point sources of pollution are overflows of central sewer systems. The dominant approach to this problem is technical in nature and the main instruments are regulatory instruments. However, economic principles, methods and instruments play a role as well. The starting point for newly built areas can be the cost-cause principle, which means that the actors responsible for hardening of the surface (real estate owners, providers of road-infrastructure) pay for the compensatory measures. The situation in which water boards *de facto* pay for those measures by subsidising preferred alternatives, does not lead to a direct link between cost cause and cost payer. In case overflows do take place, the burden of proof is now on municipalities. An economic approach to this situation would entail letting the municipality choose between two options: either taking measures to prevent the (effects of) overflows, or compensating the ones that suffer from it. The latter requires a clear and suitable institutional framework, through which the sufferers can be easily identified and will be adequately compensated for all the costs related to the effects of the overflow. The question is if such an institutional framework can really be put in place and if such an approach would be cost-effective.

6.6.3 ECONOMIC APPROACHES TO DIFFUSE SOURCES OF POLLUTION

With regard to diffuse sources of pollution, The Netherlands scores moderately high relative to other EU- and EEA-states. Top scores on environmental taxes and charges are achieved by the Scandinavian countries. The Netherlands score particularly low in the categories 'environmental tax on agricultural inputs' and 'environmental tax on other goods'. Agricultural inputs mentioned by the OECD are fertilisers and pesticides. With regard to eutrophication caused by agriculture, a system of levies on mineral surpluses (MINAS) was introduced in The Netherlands in 1998. This system can be called a true environmental regulatory tax, with the intention of reducing the use of fertilisers in agriculture. In other member states (Finland, Sweden, Austria), taxes are raised on products (the fertilisers

themselves) and not on the surpluses emitted to the environment. By taxing surpluses, the Dutch MINAS system can be said to be the most advanced environmental economic instrument in the EU for addressing mineral surpluses. Taxes or charges on pesticides are also quite common in EU member states, for example in Denmark, Finland, France, Norway, Sweden and Belgium. Such taxes or charges have not been introduced in The Netherlands, for reasons of simplicity and efficiency, mainly. Studies have also been conducted on the possible introduction of an EU-wide regulatory framework for levies on pesticides. A strong argument in favour of such a framework would be that it takes away an important argument for opponents of these instruments, namely the negative effects on competitiveness and the provocation of fraud at the borders (smuggling) in case of a unilateral introduction of a pesticide levy or tax. Besides, it is expected to stimulate industry to innovate towards more environmentally friendly (alternatives for) pesticides. However, the introduction of such an EU-wide framework is encountered with substantial technical and political difficulties. The category of 'other goods' mainly refers to taxes on consumer products, such as batteries, plastic carrier bags, disposable containers, tires, disposable razors, disposable cameras, lubricant oil and solvents. The fact that The Netherlands did not introduce environmental taxes for certain substances or products should not lead to the conclusion that there is not a proper environmental policy in place. From an interview with a policy officer of the Ministry of VROM, it turned out that it is the policy at the national level to install levies on input materials of production processes instead of on output (final product), in order to prevent a fragmented system of environmental levies.

According to OECD (1991; see chapter 3), product charges have medium prospects for application in water management. Emission charges have low applicability to diffuse pollution, since for this type of charge, the source of pollution needs to be clearly identifiable and the emission clearly measurable. These criteria are hard, if not impossible, to meet for instruments addressing diffuse pollution. According to OECD (1991), deposit-refund systems also have low applicability to water issues. As was discussed in chapter 4 (see EU COM (97) 9 final), they are being used in a number of countries, although not primarily as instruments for water policy. Nevertheless, the application of economic instruments based on the PPP could be extended in Dutch water management, as was shown by the overview of applications of these instruments in other EU-member states. The main issue in water management in which their application may be extended is that of diffuse pollution. Diffuse pollution from industry, consumers, transport and infrastructure could be addressed through emission and product levies, as is the case in several countries with regard to several types of emissions and products. Examples of such levies are product charges on pesticides, lubricants and fuels and deposit-refund systems for potentially harmful products, such as batteries.

6.6.4 FACTORS INFLUENCING THE APPLICATION OF ECONOMIC POLICY INSTRUMENTS IN WATER QUALITY MANAGEMENT

The analysis of policymaking regarding such levies for The Netherlands shows that a considerable number of possible levies is being studied and that some of those levies are seriously considered for implementation. This development is in contrast with the observation by De Savornin Lohman (1994, see chapter 3). De Savornin Lohman proposed that since with regard to environmental policy, politicians are judged by the effect of policy

on the quality of the environment, they prefer instruments that cause an efficiency risk to those that cause an environmental effectiveness risk. Apparently, there is a (number of) factor(s) causing a change in this position. Reasons for the reconsideration of these instruments may be the increasing pressure from the EU (and other actors) to address certain water quality related problems, and the implementation deficit of other types of instruments for diffuse water pollution, which has led to a stagnation of progress in water quality improvement. Another, more opportunistic factor contributing to the (relative) popularity of centralistic levies for environmental policy is the revenue raising characteristic of these instruments. This allows a shift towards greening of the tax system, which allows for a tax alleviation of other unpopular taxes such as income and business taxes. An important institution in this respect is the national framework directive for taxes on environmental grounds.

INFLUENCE OF EU-REGULATION

Many activities with regard to taxes and charges presently take place at EU level. Environmental economic instruments applied or proposed in Member States have been compared in various studies. Most of these studies serve one or both of two purposes: the first is assessing if these instruments cause competitive disturbances in the EU internal market. The second purpose is to consider possibilities for applying environmental economic instruments at EU level. As was mentioned earlier, the effect of such an EU wide framework would largely take away arguments of member states that these instruments result in competitive disadvantages. Although a major part of the Dutch water quality policy and regulations is more strict than that formulated at the EU-level, for some issues EU-regulations will act as an accelerator for Dutch national water quality management. One such issue is eutrophication of surface water by fertilisers from agriculture. The threat of substantial penalties for exceeding the EU nitrate standard has led to more stringent measures than would have been achieved in the policymaking process in the national political arena. EU regulations on environmental quality, including water quality in general, are thus a strong stimulus to (re)consider levies for diffuse pollution. An inhibiting factor for their implementation also originates from EU regulations, namely those regarding a free internal market, regulating state support to domestic economic sectors. These regulations mainly relate to the rebate of revenues. As such, they strongly inhibit (potentially successful) economic schemes for addressing diffuse pollution of water systems, since Swedish schemes showed that the rebate of revenue can be a strong precondition for target group support.

CHAPTER 7 META-ANALYSIS

7.1 INTRODUCTION

In chapters 4 to 6, an empirical analysis was made of proposals for and implementation and use of economic policy instruments and evaluation methods in Dutch water management. The purpose of this chapter is to confront and compare the data of these chapters with each other and establish whether or not themes and patterns can be discovered with regard to the factors that play a role in the implementation of the instruments discussed and the way these instruments are used (which factors and how). This analysis aims to lead to answers to the question which factors are unique for specific issues, aspects of water management and types of instruments, and which factors are generalisable to several or all issues discussed. This comparison of categories of instruments for different aspects of water management is referred to as meta-analysis. For a systematic meta-analysis, I will make use of the analytical framework of chapter 3.

The chapter starts below with a description of the criteria used for making a categorisation of types of instruments (section 7.2). Then, in sections 7.3 to 7.6, various categories of economic instruments will be compared. The scheme for comparing categories of instruments in these sections will be explained in section 7.2. A summary of the chapter will be given in section 7.7. Based on the analysis in this chapter, I will draw conclusions in chapter 8.

7.2 CRITERIA FOR CATEGORISATION

In order to be able to compare the instruments described in the empirical chapters, I made a categorisation of these instruments. This categorisation was based on 3 distinctions (criteria for categorisation), which came forth from theory about economic policy instruments (see chapter 2) and self-made distinctions based on this theory and a common categorisation in water management (see chapter 4). The comparisons made in this chapter are:

- Methods for economic policy evaluation versus economic steering instruments;
- Centralistic versus decentralised arrangements;
- Instruments addressing water quantity versus water quality management.

This chapter also contains a number of comparisons of instruments or arrangements that fall in the same category. For example, in the section about instruments for water quantity management, blue services and PPP-arrangements, which fall in the same category of decentralised instruments, are compared. The reason for this mutual comparison of instruments in the same category is that it leads to the identification of similar and different factors between these arrangements. As a result, the comparison of these arrangements

with arrangements in other categories will become more useful. By knowing these similarities and differences, the validity of generalised patterns (induction) can be assessed with more certainty.

In this thesis, the second comparison mentioned above is mainly relevant for economic steering instruments, and not so much for economic evaluation methods (EEMs). In theory, this categorisation can also be applied to evaluation methods. It would be interesting to study similarities and differences between these categories of EEMs. However, keeping in mind the time limits of this research, it was decided not to study decentralised EEMs in detail. Besides, only one type of economic evaluation method was addressed extensively in this thesis. Therefore, no comparison can be made between EEMs at various levels of governance.

The combination of the criteria presented above yields a categorisation of empirical data of this thesis as represented by table 7.1 below:

Table 7.1: categorisation of empirical data

Economic instrument Aspect of water-management	Economic steering instrument		Economic evaluation method	
	Centralistic	Decentralised	Centralistic	Decentralised
Water quantity management	Ground water and surface water extraction taxes	Blue services for water quantity management PPP-arrangements for water quantity management (LEI-study)	SCBA Rivieren-land	See text
Water quality management	Surface water pollution charge (<i>WVO-heffing</i>) for point sources of pollution Agricultural taxes (pesticides, mineral-charge, surface water pollution charge on diffuse pollution from agriculture) Levies on other sources of diffuse pollution	Blue services for water quality management	See text	See text
Water quantity and quality management combined	See text	Blue services for integrated management PPP-arrangements for spatial projects (f.e. Blauwe Stad)	See text	See text

Besides the decentralised EEMs, the table shows a number of other gaps. Most of these gaps are a consequence of the choice to focus on other arrangements for several reasons. The analysis of centralistic EEMs by means of the analytical framework takes a lot of time, since the public projects and policy programs evaluated are usually complex in nature and span a long period of time. Therefore, it was decided to only analyse one such arrangement. To

some extent, the SCBA of the alternatives in the Rivierenland-study meets the criteria of an EEM for a project combining water quantity and quality management (comprehensive project-evaluation), but the concept was primarily motivated from the perspective of water quantity management. Therefore, it is put in that category. Economic evaluations of projects for water quality management are often expressed in terms of cost-effectiveness, not as cost/benefit-ratio. Therefore, these methods are inherently not integrative and cannot be compared *ceteris paribus* with the SCBA for the Rivierenland-study. Centralistic economic steering instruments addressing both water quantity and water quality issues are scarce, if existent at all. Probably, they do exist in the form of subsidies or co-financing of projects or programmes that aim to improve water quality and quantity management in an integrated way, for example in a specifically designated area, such as a residential area or a business park. However, in this thesis I chose not to address 'positive incentives' such as subsidies, other than directly related to the types of instruments chosen as object of study in this thesis. Centralistic EIs giving a negative incentive are and have to be (very) specific in nature, and therefore they are not likely to address water quality and quantity management at the same time.

By combining the various criteria in the table above, a scheme emerges for comparing various types of policy instruments. First, decentralised arrangements for water quantity management are compared (section 7.3). The comparison of decentralised arrangements and centralistic arrangements is not performed separately for water quantity management in order to avoid repetition. The comparison of the two arrangements involving centralistic instruments for water quantity management was already performed in chapter 5. After this comparison of arrangements for water quantity management, the same is done for arrangements for water quality management (section 7.4). First, agricultural taxes are compared with taxes on other sources of pollution. Then, these arrangements for diffuse pollution are compared with the arrangement for point source pollution (the surface water pollution charge). In section 7.5, arrangements for water quantity and water quality management are compared. Since no extensive analysis was made of decentralised arrangements for water quality management, nor of economic evaluation methods, this section only contains the comparison of centralised instruments. In section 7.6, centralistic and decentralised arrangements are compared for the joint categories of water systems quantity and quality management. Finally, in section 7.7, steering instruments (both centralistic and decentralised) are compared with the economic evaluation of the Rivierenland-project.

7.3 COMPARISON OF DECENTRALISED ARRANGEMENTS FOR WATER QUANTITY MANAGEMENT

7.3.1 INTRODUCTION: THEORETICAL DIFFERENCES

As was mentioned in chapter 5, the main theoretical difference between blue services and PPP-arrangements is that in case of PPP-arrangements, goals of private and public partners are achieved (or strived for) in joint co-operation, while in case of blue services, private actors supply a service to another (public or private) actor on the basis of a business agreement. Private actors in blue service-arrangements do not necessarily have a strong

motive to engage in an arrangement with public actors, while in PPP-arrangements, they do. In blue service arrangements, therefore, the private actors are not likely to be initiators of the arrangement. Besides this difference, blue services and PPP-arrangements show a lot of similarities. The type of activities they can be used for overlap to a substantial degree.

Van Bommel et al. (2003) distinguished two types of PPP-arrangements: joint ventures (type 1) and management arrangements based on private law (type 2). Joint ventures (which are new legal entities) are usually used for the realisation of a project (area development contracts), while arrangements based on private law (contracts between public and private partners, without engaging in a new legal entity) are usually used for water management measures in areas in which no new land use functions are created. In performing public management tasks (type 2), PPP-arrangements show considerable resemblance with blue service arrangements. However, with regard to some respects, these arrangements differ from blue services as well. The main difference is that in case of PPP-arrangements, private parties (may) have an interest in changing the local water management situation, while in blue service-arrangements, private parties usually have an interest in maintaining the present situation. This difference in interests results from the fact that with PPP-arrangements, the private parties involved are usually new actors that want to change the function of the area, while in blue service-arrangements the private actors are existing dwellers and the existing land use function is maintained and combined with a water management measure. In this situation, the new (additional) land use function of water management is usually not attractive for the private actor, except (maybe) for the financial compensation that results from the arrangement. In PPP-arrangements, the private party usually does not get his income from payment by the water manager for a water management service, as is the case in blue service-arrangements. Instead, the private actor may even contribute to financing water management, in exchange for commercial exploitation of the designated area.

7.3.2 ELEMENTS OF THE ANALYTICAL FRAMEWORK

MACRO-LEVEL ANALYSIS

Market changes: relative prices of goods and services

Both blue service- and PPP-arrangements respond to changing needs in society with regard to rural areas, such as the decreasing importance of (traditional, modernistic) agriculture and the increasing need for recreational facilities. Whereas blue service-arrangements aim at strengthening (or revitalising) the existing agricultural function by widening the range of services provided by the agricultural enterprise, PPP-arrangements (especially type 1) usually replace the agricultural function by new functions. From an ideological point of view (preserving agriculture as the most important 'method' for land management in rural areas), farmers and their representative organisations can be expected to prefer blue service-arrangements for water management to PPP-arrangements. Since the agricultural sector realises that, under pressure of public opinion and societal trends (such as ecological modernisation and growing appreciation of non-material values), changes will have to be made in agricultural practices, a commercial approach to spatial water management via blue

service-arrangements may be seen as the best strategy to represent agricultural interests and consolidate the position of agriculture in the rural area.

MESO-LEVEL ANALYSIS

Policy purposes and choices

Purpose of the arrangements

As was mentioned above, two types of PPP-arrangements were distinguished. In case of a type 1-arrangement (usually erected for area development), the purpose of the PPP-arrangement from the perspective of public authorities is to get to a proper cost-benefit balance for project realisation by having private parties co-finance the project. In case of a type 2-arrangement (for water management measures combined with commercial exploitation), the purpose is to achieve cost-effective water management (and possibly other public tasks in rural areas) by involving private actors. The latter is also the purpose of blue services. Thus, generally speaking, both PPP-arrangements and blue service-arrangements have the purpose of cost-effective water management, but the way they aim to achieve this differs. PPP-arrangements aim to make private parties co-finance public tasks, while blue service arrangements aim to spend less financial resources on management by paying private actors for allowing water management to take place on their property as an alternative for the appropriation and management of areas by water managers themselves.

Complexity and priority order of the arrangements

According to Van Bommel et al. (2003: 59), blue service-arrangements are in general easier to construct than PPP-arrangements. Besides, in most cases, the execution of management tasks by the water manager himself is easier to arrange than in case of involving private parties for this. Therefore, according to Van Bommel et al., water managers, when looking for ways to realise spatial water management goals, (should) maintain a priority order. First, they will consider taking measures themselves. If this is considered unachievable or undesirable (for whatever reason, including cost-effectiveness), they will consider blue services, and if this is also considered unachievable or undesirable, PPP-arrangements will be considered.

Informal institutions

Paradigms

One of the financing principles of PPP-arrangements (especially type 1) is that profitable land use functions (partly) finance non-profitable (public) land use functions. This can be seen as a form of 'internalisation of externalities', which is a central characteristic of the 'resource management'-policy paradigm. In blue service arrangements, on the contrary, private actors are rewarded for offering (public or private) services. As Van Bommel et al. (2002 and 2003) indicated, in many cases one can question whether blue services should be regarded as services offered by landowners that go beyond standard practice, as standard practice, or even as stopping former services to landowners by water boards (and thus in essence by nature). The dominant discourse seems to be the first interpretation. This interpretation fits the environmental protection paradigm. A principal strategy of this paradigm is to 'legalise the environment as an economic externality' (see Colby, 1990; and chapter 3). Furthermore,

in this paradigm, 'command and control regulatory approaches are relied upon to set limits on pollution or other damage. Because economic analysis seeks only limited, monetary-based types of information, and ecological benefits are difficult to quantify, environmental management in this paradigm only shows up as added costs. Impacts of excessive environmental depletions (resource exploitation) or insertions (pollution) are dealt with after they occur and are usually paid for by the public at large' (Colby, 1990). Many of the characteristics of the environmental protection paradigm can be found in blue service arrangements. Firstly, the distribution of property rights is based on CAC-instruments for environmental management, which are based on the SPPP. Besides, water management shows up as costs, ecological benefits are not quantified and the water management measures are paid for by the public at large, since the existing distribution of property rights is largely consolidated. This latter aspect is likely to enhance the acceptance of blue service arrangements by suppliers of the service. In order to make PPP-arrangements possible, the zoning plan often has to be adapted, and public authorities can raise the environmental quality standards of the area by setting new preconditions. This way, these arrangements may operate according to the EPPP and water management is (at least partly) paid for by directly involved private parties. As such, in these arrangements, environmental costs and benefits are, to a certain degree, internalised in private economic decision-making. This approach fits best in the paradigm of resource management. However, the benefits of aquatic ecosystems, as is a characteristic of this paradigm, are not yet made explicit.

Formal institutions

Policy principles

Both decentralised arrangements are in line with the subsidiarity principle formulated at EU level and the deregulation policy (and thus the trend towards deregulation) formulated at the national level. Furthermore, the benefit principle (formulated at national level) and the cost recovery principle (formulated at EU level) are combined. According to the first principle, the ones that benefit from water management activities (in this case the water board, on behalf of the 'general public') pay the ones that make the costs (or incur the damage). The second principle states that this should be done to such a degree that these costs should be fully recovered. With regard to these arrangements, it should always be considered carefully who benefits from the measures and thus who should pay. These questions address issues of property rights, which lie at the very heart of the debate about spatial measures and should therefore be handled with care. The discussion of paradigms underlying PPP- and blue service-arrangements showed that PPP-arrangements are based (more) on the extended polluter pays principle (EPPP), while blue service-arrangements are based on the standard polluter pays principle (SPPP). The reason for this was explained before.

Guidelines and standardisation

In case of blue service-arrangements, there needs to be clarity about what activities are regarded as 'standard' water management activities by private actors, which will not be paid for, and 'extra' services, which will be paid for. Standard land and water management services by private actors can be described in guidelines such as 'good agricultural practice' and 'standard' versus 'exceptional' (or 'extra') water nuisance. In case of PPP-arrangements, such a distinction between standard and extra services also needs to be made, but in this case, the argumentation is the other way around. In PPP-arrangements, private actors are

required to co-finance public water management facilities that can be regarded as standard facilities for that area. Any extra water management facilities a water manager wants to introduce in that area (such as storage of external water, as is the case in the Blauwe Stad-project) will have to be paid by that water manager. As was mentioned above, for both types of arrangements, clarity about property rights (especially disposition and use rights) with regard to land use and 'environmental use space' (*milieugebruiksruimte*) is crucial to determine whether or not an activity is an 'extra activity', which should be rewarded.

Contracts

The type of contracts for blue service arrangements and PPP-arrangements are quite similar, and to a large extent, the aspects that need to be paid attention to are comparable. The contracts of PPP-arrangements for structural water management activities are more similar to blue service contracts than PPP-arrangements for area development. In case of management agreements, either via blue services or PPP-arrangements, long-term contracts are more important for the (primary) private actors involved than in case of area development contracts, since in the former situation, the primary private actors are dwellers, while in the latter, they are nomads.

Phase of institutionalisation

Both PPP-arrangements and blue service-arrangements are relatively new arrangements in water management and have not been applied to a large extent yet. However, in other domains, experience has been gained with both approaches. Blue services can be compared with green services, in which landowners (mostly farmers) offer management services to improve the ecosystem. Experiments with these arrangements have been performed for a while, and therefore, they are nowadays fairly well institutionalised. The relevant question in this respect is whether or not blue service arrangements require institutions that are (very) different from the ones needed for green service arrangements. This is likely to depend on the type of blue service foreseen. Generally speaking, the limited controlability and predictability of water introduces an extra risk factor in agreements. Besides, the fact that blue services often need to be offered in substantial areas in order to contribute to the water management purpose foreseen (at least for water quantity management) usually makes collective agreements necessary. This maybe less the case for green services. However, this matter was not discussed in detail in this thesis. Experience with PPP-arrangements has been gained in infrastructure, urban development and the development of rural areas. So far, however, they have not (as explicitly) included public water management projects or management tasks. The question with regard to the institutional setting is similar to the one for blue and green arrangements.

Discourses

In spatial water management according to blue service or PPP-arrangements, the normative discourse shifts from 'water as a condition' to 'water as a service' or even 'water as a product'. The expectation is that this shift in normative discourse will intensify the debate about property rights, especially disposition and use rights of land and 'environmental use space'. As was indicated before, in blue service arrangements, the 'service' is offered by private actors, while in PPP-arrangements, private actors finance water management facilities, and thus the 'service' is offered by the public water manager (the private party (indirectly) pays for the water required, without being a demanding party). Besides, in PPP-

arrangements, other land use functions are often adapted to the possibilities of the water system, and not vice versa. This approach can be referred to as eco-pragmatism. This approach will lead to a fundamental and structural re-distribution of property rights in the long-term.

Actors

To a large extent actors in blue service-arrangements and PPP-arrangements are similar. Both arrangements involve (a) public water management organisation(s) and private landowner(s). One major difference is the fact that in PPP-arrangements, often entrepreneurs (both nomads and dwellers) are involved that do not possess land. Besides, depending on the type of PPP, the private actors involved are more likely to be of the nomadic type. In blue service arrangements, the primary private partners involved in the arrangement are exclusively landowners, who are usually dwellers and/or their representatives. This situation has to do with the fact that in blue service arrangements, water management measures are usually combined with existing land use functions, while in PPP-arrangements, often new land use functions are introduced (including water management), involving new landowners or users. This offers (business) opportunities for entrepreneurs that do not hold the property rights of the land in question. In other words, the change of land use function in the development plan (zoning plan) is often the very motive for non-land owning entrepreneurs to get involved in the PPP-arrangement. As a consequence, the potential range (in categories) of private actors in PPP-arrangements is larger than in blue service arrangements.

Nomadic entrepreneurs are more likely to regard water and related activities as a commercial product or service than dwelling entrepreneurs, since they are not (emotionally or ideologically) attached to the land and the existing land use function. Nature terrain managers and nature organisations are more likely to be in favour of temporary water management measures in nature areas in case this is arranged in a PPP-arrangement than in case it is arranged via a blue service arrangement, since a PPP-arrangement is likely to involve a change in land use function towards nature (so new nature), while in case of blue service arrangements, existing nature is involved, which may be negatively influenced by temporary water storage. This distinction is not so relevant for structural water quantity measures, since these will in most cases be beneficial for nature, no matter the type of arrangement.

The public authority authorised to change the zoning plan is the municipality. In blue service arrangements, the existing land use function usually remains the same. In some cases, an additional land use function (*nevenfunctie*) 'water storage' or 'water management' will have to be introduced, and the zoning plan will have to be adapted for this. This is especially the case for structural water management measures. In most situations involving blue service arrangements, however, no adaptation of the zoning plan is required. Therefore, the role of the municipality will in general be larger in PPP-arrangements than in blue service-arrangements. The changing of zoning plans is a democratic procedure which provides any actor with the opportunity to object and start a legal procedure based on public law. As a consequence, PPP-arrangements have the character of policymaking processes according to the majoritarian politics model (see Wilson, 1989 and chapter 5). One of the characteristics of this model is that costs and benefits of public facilities are spread evenly over various

actors. In the case of PPP-arrangements, costs and benefits are allocated mainly according to the extended polluter (or user) pays principle. In blue service-arrangements, since often no change in the zoning plan is required, the policymaking model shows more similarities with the corporate governance model. In this model, deals can be made between public and private parties without the regular mechanisms for democratic legitimisation and control. In this model, the costs are spread over a large number of actors, while benefits usually accrue to a more limited number of actors. Blue service-arrangements are, however, not a form of client politics. According to Wilson, in such a model, the costs are spread over a large number of actors, while the benefits accrue to only a very limited number of actors. There are several reasons why this is not the case with blue services. Firstly, the assumption is that everyone in a river basin benefits from blue service-arrangements, and that therefore, these measures can be legitimately paid from a general water management budget. Secondly, it is not clear whether or not the landowners paid for their service or compensated for damage benefit from the scheme (in other words, whether or not compensation is sufficient to (more than) offset the damage/costs incurred).

All in all, the number of (types of) actors involved in blue service-arrangements is small compared to PPP-arrangements. This in general makes the policymaking process involving PPP-arrangements more complex. Hence the priority order made by water managers with regard to the way to achieve policy goals, as discussed before, is likely to be applied in practice.

Power and resources

In decentralised arrangements, private stakeholders (especially target groups) are usually involved in an early stage, because of the dependence on these actors for the realisation of the arrangement. This approach is comparable to that of suasive instruments, either at the national or the regional or local level, since both decentralised and SI-arrangements are based on voluntary co-operation laid down in some sort of agreement. At the national level, the policy of voluntary agreements needs to pass the process of democratic legitimisation in the lower house. At the regional or local level, this does not always have to be the case, as will be argued below.

The general public has several ways to influence the decision-making process of decentralised instruments, depending on the type of arrangement. In case of a PPP for which an amendment in the zoning plan is needed, the general public can influence the decision-making process via the democratic institutions of this process, such as public hearings, legal protests and lobbying. Besides, representative democratic legitimisation takes place in the municipal council. In case no amendment in the zoning plan is needed, options for the general public are more limited. The primary actors are the water board and the landowners, and democratic legitimisation has to take place in the water board council and possibly in the provincial council (since the province supervises water boards). The options for direct influence (public hearings, legal protests and lobbying) are not available or only to a limited extent. Lobbying by stakeholders in the council of water boards is less common practice than in the councils of the public bodies for general democratic representation (central government, provinces and municipalities). Blue services may therefore be perceived the general public as a less democratic instrument than PPP-arrangements.

Authority

Since in blue service-arrangements often no change in development/zoning plan is envisioned, water managers have limited legal resources to enforce 'the water interest' in spatial planning via these arrangements. Only in case locations are appointed by higher (i.e. national or provincial) government levels for peak or calamity storage, based on a paramount societal interest, the 'water interest' can be enforced upon an area. In that case, however, one can no longer speak of a blue service-arrangement, since these arrangements are based on voluntariness. Since in case of a change in the zoning plan water boards do have legal instruments to enforce water related interests (via the *watertoets*), the position of water boards in PPP-arrangements is stronger than in blue service-arrangements.

MICRO-LEVEL ANALYSIS

Technical criteria

Transparency and voluntariness

Transparency about the terms of co-operation (the content and consequences of the contract) and stakeholder goals and intentions seem to be crucial for both types of arrangements, since they are both based on voluntary co-operation of stakeholders and/or approval by the general public (that can influence the process via direct participation, legal procedures, representative democracy and by influencing stakeholder opinions). Transparency and voluntariness may be interrelated. PPP-arrangements are more transparent than blue service-arrangements, since the process of appropriating land in the PPP-arrangement is legitimised by the majoritarian process of changing the land use function in the zoning plan. For the co-operation of landowners with blue service-arrangements, no such democratic institutions exist. As a consequence, this process may be more susceptible for undemocratic processes involving the exertion of power, the use of story lines and moral pressure.

Contract characteristics

Motivation mechanisms are more important in some arrangements than in others. They seem to be more important for long-term arrangements than for short term arrangements, since in the former, moral hazards are larger. Long-term arrangements play a role in both blue service- and PPP-arrangements for water management (type 2). PPP-arrangements for area development are usually shorter term arrangements (because they involve nomadic private actors instead of dwelling ones). Moreover, the mutual dependence and mutual benefit of these area development arrangements are more prominent than in case of management agreements or blue service arrangements.

Transaction costs

As was indicated in the presentation of the separate approaches, water boards do not hold the power to force landowners to co-operate with water management measures via blue services-arrangements . Therefore, water management via these approaches will require a careful negotiation process which may take a long time and which may involve substantial transaction costs. In PPP-arrangements, a legal procedure needs to be passed for the adaptation of the zoning plan. This procedure for changing the zoning plan also takes a lot of time and involves transaction costs. Once consensus has been reached and the zoning plan

has been changed, however, the goals of the PPP- and BS-partners can be achieved relatively quickly and with limited transaction costs, since they are backed up by a legal agreement.

Political criteria

Public, stakeholder and target group support

Firstly, in blue service-arrangements, (potential) suppliers of a water management service are more likely to have an emotional or ideological relationship with the land and the land use function. Therefore, it may be hard to convince these landowners of the necessity of water management measures. Secondly, in case of management agreements (either via blue service or PPP-arrangements), long-term relationships are started with dwelling suppliers. In order for those long-term relationships to succeed, actors involved need to trust each other. Finally, in PPP-arrangements for area development, investments in public support and support from secondary stakeholders seems very important, because of larger financial risks for public authorities and scepticism about the (public) financial feasibility of the project.

Equity

As was mentioned before, in blue service-arrangements, private actors are rewarded for offering water products or water management services. These blue services are paid for by the general budget of the water manager. The questions with regard to this construction are whether the actors offering the service should be rewarded and whether the actors financing the general budget should pay for the blue service. In contrast with this structure, in PPP-arrangements, private actors are made to contribute to financing public facilities. As long as this contribution is substantial, the equity issue will probably play a smaller role in the decision-making process about PPP-arrangements than in the one about blue services.

Sustainability

Blue service and PPP-arrangements show varying scores on the sustainability criterion. Arrangements that aim to change water management in order to achieve a structural positive effect on the long-term, such as countering subsidence, desiccation or salinisation, providing good water quality or prevention of (local) water nuisance, will score higher on the sustainability criterion than arrangements that aim at temporary mitigation of water nuisance, such as peak and calamity storage. The former arrangements aim at long-term effects and are preventative in nature. The latter measures are more reactive in nature and directed at benefits (or prevention of costs/damage) on the short term (peak storage). However, in turn, these measures may be more sustainable than technological approaches to flood protection, for a range of reasons (such as eco-pragmatism, diversification of agriculture and lower operation and maintenance requirements (and costs)). Combining agriculture with water management is likely to score well on the sustainability criterion from a socio-economic point of view. These measures lead to a diversification of farmers' sources of income, which may lead to better perspectives for continuation of their businesses.

Innovation

Both types of management arrangements (blue services and PPP-arrangements for water management) can stimulate innovative approaches among farmers. Innovations can be stimulated by financial incentives and output oriented goals in the contract. In order to invest

in innovation, farmers need certainty about the income from blue services. Therefore, long-term management contracts can stimulate a shift towards more sustainable agriculture. The involvement of farmers (and other dwellers, mainly landowners) in the decision-making process about decentralised arrangements is likely to give these actors confidence in the future (feasibility of their business). Innovations in other land use functions are more easily introduced in case of project development (type 1 PPP-arrangement), since in this situation, the design of an area can be approached in an integrated way, applying multiple land use planning. In the arrangements in which existing landowners keep their property rights, path dependent objections or hesitation may exist regarding multiple land use planning.

7.3.3 SUMMARY

In this section, decentralised arrangements (blue services and PPP-arrangements for multiple land use planning including water storage) were compared that pro-actively deal with developments in society and the physical environment on a regional or local scale in rural areas. Since these arrangements are new in water management, not much experience exists yet with regard to their application. Therefore, the arrangements have not yet been institutionalised, which results in a considerable degree of uncertainty about their feasibility and risks, and considerable transaction costs for the reduction of these risks via information gathering and the settlement of contracts between parties.

With regard to property rights and their translation into contracts (who pays who?), the normative discourse shows two opposing story lines, uttered by two policy coalitions. On the one hand, the agricultural sector, its representatives and related interests emphasise the payment of landowners for water services they provide. On the other hand, water managers and related interests emphasise the service these water managers already provide to the agricultural sector, via for example water level management. Whether farmers and landowners should pay or be paid for water management services depends on the formal existing and future land use function of the area and the rules and regulations attached to that land use function. Farmers have acquired a historically grown right on water level management for agricultural purposes. Therefore, if this water quantity management regime is changed, for example for the purpose of water storage, they will claim the right to be compensated. In case the water regime is not changed, a stricter application of the benefit principle may gradually lead to a higher degree of cost recovery for water level management from the agricultural sector. This would gradually lead to an informal but real change in property rights. Activities by the EU with regard to formulating normal ('good') and extra agricultural practices are likely to lead to such a gradual change in property rights. This is especially relevant for blue service arrangements, the property rights in which are not likely to change through national policy.

The various arrangements discussed in this section differ with regard to (discourses about) the priority order of the policy principles applied. As a consequence, they also differ in the discourse about property rights. In case a current land use function is going to be combined with a new function related to water management, such as water storage, the dominant discourse is that the existing distribution of property rights will be taken as the starting point for the design of the payment/compensation scheme. This situation applies to blue service-arrangements. In these situations, the fact that water managers already offer a service to

the landowners, for which they should be paid by these landowners according to the full cost recovery principle, does not seem to play a role in the debate. In case the land use function, as laid down in the zoning plan, is going to be changed for the purpose of realising a project or introducing new land use functions, a redefinition of property rights becomes possible. In other words, an adaptation of the zoning plan is an opportunity for public authorities to impose new environmental or water management standards (and the related property rights) on a specific area. This mechanism can be applied in both types of PPP-arrangement.

THREATS

As was discussed in the presentation of PPP-arrangements in chapter 5, giving more room to the market in spatial planning (which is envisioned in the recently published Nota ruimte (Ministry of VROM, 2004)) reduces possibilities for PPP, since private parties do no longer need public parties to realise their plans. This threat is less of an issue in blue service arrangements than in PPP-arrangements, since the private actors involved in the former type of arrangements are less likely to change land use without incentives from public parties. In both cases, by the way, private actors will need permission from public authorities, either in the form of a permit or an amendment of the zoning plan. Whether this provides sufficient guarantees for the representation of public (water) interests was not addressed in this study. Another threat to these arrangements are EU regulations about competition and state support.

7.4 COMPARISON OF ARRANGEMENTS FOR WATER QUALITY MANAGEMENT

7.4.1 INTRODUCTION

In chapter 6, a number of economic instruments for water quality management were discussed. In this section, the categories of instruments addressed separately in chapter 6 will be compared. First, in subsection 7.4.2, levies addressing diffuse pollution from agriculture will be compared with other levies addressing diffuse pollution. Then, in subsection 7.4.3, levies for diffuse pollution will be compared with the levies for point source pollution, represented by the waste water charge.

7.4.2 COMPARISON OF TAXES FOR DIFFUSE SOURCES OF POLLUTION: AGRICULTURAL VERSUS OTHER ACTIVITIES

INTRODUCTION AND GENERAL CHARACTERISTICS

In principle, the instruments compared here are similar in nature (see below). Therefore, mainly differences between the categories will be highlighted here. Similarities will only be highlighted in case they are considered key characteristics of both categories of instruments. Besides, only those elements of the analytical framework will be discussed that were considered either remarkable or significant and that did not overlap with previous sections.

Purpose/occasion of the instruments

The purpose of the instruments compared here is quite similar. Both categories aim to influence environmentally adverse behavior causing diffuse pollution. Both agricultural and non-agricultural instruments studied or implemented have been studied within the framework of greening the tax system. Therefore, these instruments automatically also have a revenue raising purpose. This seems to be more dominant with regard to target groups that are not very well organised, i.e. to diffuse pollution from heterogeneous sources. Therefore, they seem more prominent in the category of non-agricultural sources than in the agricultural sectors, since the latter sector in general is a well organised and powerful target group. The good representation of this target group in the political arena may well account for the fact that both regulative and revenue raising environmental taxes for issues related to agriculture are scarce.

MESO-LEVEL ANALYSIS

Actors

Target groups

In general, target groups oppose to centralistic economic policy instruments with a negative incentive because of the expectation that they will increase the financial and administrative burden. Opposition from agriculture seems to be stronger and more effective than that of other target groups. One likely reason for this is that this target group is more homogeneous in nature than most others. Besides, and partly as a result of this, they have a stronger representative organisation than many other target groups. Especially general tax payers are too heterogeneous to be effectively united and strongly represented. Besides, in general they lack the resources to influence political decision-making. As a consequence, there is a tendency towards under-representation of this target group in political decision-making. However, this aspect was not studied in this thesis. In contrast to 'general tax payers', and in line with agriculture, other economic sectors (such as industry and transport) possess the financial resources needed to form an effective representative organisation and to exert pressure on the political decision-making process in various ways.

Discourse

At present, the dominant ontological discourse in environmentally oriented political circuits with regard to diffuse pollution is that there is a lack of awareness about the state of the environment and the effects of human activities on this state of the environment. The argument for the normative discourse following from that is that economic instruments (alone) do not help, since they do not raise awareness¹⁹⁸. Without target group awareness, no target group support results, and without target group support, no environmental effectiveness will be achieved. Therefore, and (probably) for other reasons, the emphasis in addressing diffuse pollution is on SIs, such as covenants with separate economic sectors and on corporate social (and environmental) responsibility. In these approaches, government authorities try to reverse the burden of proof and lay it on the target groups, together with

¹⁹⁸ See Russell (2001) and chapter 2 for a discussion of the relationship between imputed cause of environmental problems and suggested policy approaches.

placing the responsibility for monitoring with these target groups. This reversal aims to have two types of positive effects: lower monitoring and enforcement costs for public authorities, and (forced) awareness raising and a pro-active attitude of target groups. Fiscal measures may occasionally fit in this approach, but they do not constitute the backbone.

SUMMARY

Obstacles and stimulating factors

In the period of the environment-oriented cabinets of Kok (I and II), there was a lot of political attention for centralistic economic steering instruments for environmental policy. During the cabinets of Balkenende (I and II), this attention largely disappeared. As a consequence of negative or insufficient results in environmental policy and the increasing pressure from the EU in this respect, the debate about greening of the tax system has resurfaced again in recent years. This debate has resulted in the introduction of a number of centralistic economic instruments for environmental policy providing a negative incentive and other levies may still be introduced. An important advantage of these instruments (which partly explain their popularity in the political and administrative arena) is their revenue raising characteristics, which is likely to result in support from the Ministry of Finance, and which may lead to an alleviation of the tax burden on other activities which are less related to the Polluter or User Pays Principle. Generally speaking, however, centralistic economic steering instruments are still not popular.

7.4.3 COMPARISON OF INSTRUMENTS FOR POINT-SOURCE AND DIFFUSE POLLUTION

GENERAL CHARACTERISTICS

Level of implementation

An advantage of the waste water charge over the levies for diffuse pollution is that the details of the charge are tuned to local circumstances. This is possible because the charge is based on a framework act. This characteristic makes it possible to make the charge more specific. This is likely to reduce the number of (groups of) actors that feel negatively and unrightfully affected by the instrument. A tailor-made approach is possible because of two main characteristics of the issue addressed. Firstly, the waste water charge is an instrument directed at covering the costs of waste water collection and purification. Therefore, in principle, the instrument aims to charge only true users and polluters, and only to the degree needed to ensure full cost recovery. Secondly, because of the decentralised collection of the charge, the locality of the infrastructure, and the locality of the effects of non-compliance (local and to some degree separated recipient water systems) it is possible to diversify according to exogenous variables (local circumstances). This is more difficult for the levies for diffuse sources of pollution. Firstly, the instruments to address these sources are not primarily meant as financing instruments, but as regulative instruments (difference in intentionality). With these types of instruments, it is more difficult to diversify according to exogenous variables. Secondly, in order not to get too much variation in the way these levies are implemented and collected, the levies for diffuse pollution are collected at a central level.

Besides, a number of other characteristics, such as the scale of effects, the diversity of activities addressed, the complexity of the mechanisms regulated, and the fact that many of the substances addressed affect not just the environmental aspect 'water' make it difficult and costly to diversify (discriminate) and thus specify the instruments.

MACRO-LEVEL ANALYSIS

Shock events

A central characteristic of diffuse pollution is that sources are numerous and widespread and that the effects occur gradually and via complicated mechanisms. Therefore, this type of pollution is not very visible, which makes it hard to keep attention focused on this aspect of water (quality) management¹⁹⁹. Other aspects of water management, like water excess, or occasional point source calamities, can cause shocks in the societal and political arenas, which ensures agenda setting and thus considerable attention for these issues for some time period. This is usually not the case with diffuse sources of pollution. The biggest shock events with regard to diffuse pollution are usually related to the publication of (alarming) scientific studies. However, the awareness about the severity of the situation is not always transferred from the scientific to the political and societal arena.

MESO-LEVEL ANALYSIS

Informal institutions

Problem ownership

The issue of problem ownership shows similarities between the situation regarding point sources of pollution in the 1970s and that regarding diffuse pollution in the 1990s and 2000s. This similarity can be explained by the similar stage of institutionalisation these policy issues were in in those periods of time. The initiative for a waste water tax in the 1970s resulted in fierce protests by both industry and citizens, since they didn't regard themselves as polluters. At that time, the main cause of this perception was the general unfamiliarity with environmental issues. Since the 1960s and 1970s, environmental policy has been accepted as an integral part of public policy (in other words: has institutionalised), which has resulted in the acceptance of a (substantial) number of policy arrangements to address environmental issues. The debate about diffuse pollution in the 1990s and 2000s shows similarities to that regarding point source pollution in the 1970s, in that target groups often do not regard themselves as polluters. However, in this case, this perception is not the result of unfamiliarity with environmental issues in general, but rather of arguing from the point of view of existing environmental institutions, and perhaps unfamiliarity with the gravity of diffuse pollution. The dominant story line of opponents of further measures is that target groups have already been (sufficiently) addressed (and thus affected) by environmental policy in the past, and that an adequate arrangement is already in place. The dominant paradigm in this point of view is that humans are allowed to use 'environmental buffer capacity' to a certain degree, as regulated by environmental standards (SPPP). Institutions

¹⁹⁹ Such 'not so visible' environmental problems, which are not so easy to address and (thus) continue to exist are often referred to as 'creeping environmental problems'.

have been based on this paradigm that grant polluters a historically grown right to pollute. Stricter environmental regulation than the existing standards is argued to be very costly for target groups and will result in only marginal improvements in environmental quality. Therefore, this step is rejected on the grounds of efficiency and economic impacts. The second factor leading to the situation that sources of diffuse pollution may not regard themselves as such is that the effects of diffuse pollution may still be uncertain or unclear to the polluters, and may therefore be trivialised. In other words, there is no consensus in the ontological discourse about many types of diffuse pollution.

This issue of problem ownership and informal property rights was already identified with regard to farming. However, in other economic sectors too, polluters may not initially regard themselves as problem owners. This attitude clearly fits the 'water as a condition'-discourse. In this discourse, customers/actors benefiting from water management do not necessarily bear an equal portion of the costs and hold the opinion that they should not, since water is a public good, and water management is a public task. Instruments that fit the 'water as a service'- or 'water as a product'-discourse may (in the long run) change target group attitude towards incorporation of the (E)PPP.

Formal institutions

Levels of policymaking

Because of the different moments in history the societal and political agenda setting took place, the institutional framework is different with regard to the dominant policy level. The laws and regulations for point source pollution in the 1970s and '80s were introduced at the level of the EU Member States. The political emphasis of the policy arrangements therefore lay with the national governments as well. Later, when EU-regulations were prepared and introduced, either national arrangements were tuned to EU-regulations, or the EU-regulations were formulated in such a way as to form a framework that could fit in national arrangements. As we have seen before, some national arrangements even served as examples for EU-policy, as was the case with the Dutch waste water tax. In the debate about policy for diffuse sources of pollution, EU-policy and regulations are important and sometimes decisive for initiatives at the Member State level from the very start. Because of the dominance of policy and regulations at the EU-level, Member States seem to have become more reluctant to take policy initiatives for diffuse resources themselves. They fear that front-runner initiatives may be repealed by the EU because of non-concordance with the normative and strategic discourse at EU-level. Rather, they appear to wait until clarity exists about the policy intentions at the EU-level before constructing or further intensifying their own arrangements.

Organisation of water quality management

For a long time, water quality issues were not considered a task of water boards. This even remained the dominant story line when water quality related problems as a result of economic growth and developments became undeniable in the 1960s. For centuries, water boards had only been occupied with water quantity management. Still, the active tasks of water boards with regard to water pollution are concentrated on point sources of pollution. Active tasks with regard to diffuse water pollution are mainly performed by other ministries, such as *LNV* for diffuse pollution from agriculture and *VROM* for most diffuse pollution from

industry, transport and consumers. The ministry of V&W and related water research institutes are mainly involved in monitoring water quality and in performing studies in relation to water quality policy. Intensive co-operation and co-ordination between the ministries mentioned would therefore be required for an effective integrated water quality management.

Embeddedness and stability

In the 1960s and '70s, point sources of pollution were the most visible sources of pollution. In that period, little awareness existed regarding diffuse sources of pollution. Besides, the degree of diffuse pollution and its effects were more limited than in the 1990s and at present. As a consequence, since the 1970s the institutional framework addressing point sources of pollution has developed more completely than that for diffuse sources of pollution. Additional factors enhancing this difference are that the number of types of point sources of pollution is limited and there is less uncertainty and doubt about the relationships between emissions and environmental effects and between a policy instrument and its regulative effect. As a consequence, policy arrangements regarding point sources of pollution are more stable than that regarding diffuse sources. The larger consensus about sources of pollution, dose-effect relationships and the effectiveness of policy instruments (in short, the generally lower degree of uncertainty) makes it easier to implement centralistic policy approaches for point sources of pollution than for diffuse sources of pollution. The pervasive uncertainty with regard to these aspects for diffuse pollution may be an important reason for the present preference for less 'blueprint'-like policy arrangements, involving suasive instruments, backed up by CAC-instruments.

MICRO-LEVEL ANALYSIS

Technical criteria

Environmental effectiveness

With regard to almost any economic steering instrument, there are *ex ante* doubts about the environmental effectiveness of the instrument. Since the primary intention of the waste water charge was not regulating environmentally relevant (and adverse) behaviour, but rather (full) cost recovery, this issue played less of a role in this arrangement than in the arrangements addressing diffuse pollution. This may be one of the reasons for the recent switch in strategy towards putting more emphasis on the greening of the tax system (and thus the revenue raising characteristic) of centralistic economic instruments addressing diffuse pollution than was formerly the case. The succesful reduction in pollution load from point sources (and thus its environmental effectiveness) can for a large part be ascribed to the rebate of the revenu of the tax to the target groups in the form of technical assistance, information and training with regard to switching to less polluting production technologies.

Dynamic incentive and easy of monitoring

Studies showed that the waste water charge provides a dynamic incentive to further reduce the pollution load of waste water, since the height of the charge (for dischargers onto surface water and large dischargers onto the sewer system) is based on actual pollution. In general, monitoring of emissons or pollution loads (immissions) is (far) more complex and costly for diffuse sources of pollution, which makes it difficult to base the height of the levy on actual

emissions. Therefore, with diffuse pollution, levies will usually be based on standardised estimates, which reduces their specificity and dynamic incentive. On the other hand, standardised levies bring along lower monitoring costs and efforts.

Political criteria

Intentionality

As was mentioned before, the instruments for diffuse pollution primarily aim at regulating environmentally adverse behaviour. Because pervasive uncertainty (and thus doubts expressed by opponents) exists about the relationships between substance and environmental effect and the environmental effectiveness and the efficiency of the instruments, they are heavily contested. The waste water charge, besides being directed at curbing emissions, is also directed at fully covering the costs of waste water treatment. As such, the relationship between the height of the charge and the costs covered is more clear and direct than for instruments for diffuse pollution. This enhances the likeliness of acceptance of these instruments.

7.4.4 SUMMARY AND CONCLUSION

In this section, a number of centralistic economic policy instruments for water quality management were compared. First, (centralistic) economic policy instruments for diffuse pollution by agriculture were compared with similar instruments for other sources of diffuse pollution. After that, instruments for diffuse pollution were compared with the waste water charge addressing point source pollution.

The expectation with regard to both categories of instruments for diffuse pollution was that similar factors would play a role in their design and implementation, because of the similarities with regard to level of implementation and type of issue addressed. To a large extent, this expectation can be confirmed. The major difference between these two categories is that (in general), the agricultural sector as a target group is better organised than many other sectors. Besides, the instruments addressing pollution from agriculture only address one economic sector. Most other instruments address several economic sectors and (groups of) actors and more diverse activities. As a consequence, interests may be more diverse, protests may be more difficult to organise and target groups may be affected by the instrument to different degrees. This may make it more difficult for opponents to organise strong opposition. Besides, the diversity of target groups may make it easier for politicians and public administrators to change the design of the instrument to 'please' (specific) target groups. Whether this takes place in practice did not show from the available data. On the other hand, the heterogeneity of the target groups of instruments for non-agricultural sources makes it more difficult to design a scheme that is equitable and fair. This may lead to target group protests after all, and target groups with similar interests may join to form a strong policy coalition opposing to the instrument. In short, the policy arrangement for addressing other sources of diffuse pollution is more complex than that for addressing diffuse pollution by agriculture in various respects.

Since the waste water charge is an economic instrument the decision-making of which took place at the national (central) government level, it is in that respect similar to the

instruments for diffuse pollution. The main difference lies in its level and way of implementation. The level of implementation of the waste water charge is more local than that of instruments addressing diffuse sources of pollution. This allows for more tailor made design and application of the instrument. The way the instrument is implemented varies among public authorities, in that the waste water charge, besides aiming at a regulative effect to improve environmental quality, has a strong emphasis on full cost recovery. Because regional and local characteristics may vary, the height of the charge may vary as well in order to achieve this full cost recovery. This relationship between charge and costs made by the water manager may make the instrument more transparent, and as a result more acceptable for target groups. The instruments for diffuse pollution primarily intend to have a regulative effect, and the full cost recovery principle does not play a (substantial) role. This may result in lower transparency with regard to the use of the revenues, and as a consequence in lower target group support. Besides, the mechanisms addressed by these instruments are in general more subject to uncertainty, and therefore more heavily debated. One of the ways to improve target group support is a scheme which provides for rebate of revenues to the target groups, possibly in the form of a positive incentive for environmentally more benign behaviour. Another way, which seems to be gaining in popularity, is to legitimise the instrument not exclusively from the perspective of the regulative effect, but also from the perspective of a shift towards greening of the tax system, which legitimises the (non-labelled) use of revenues. This argument is even used by political actors that in general do not adhere to strong environmental paradigms.

7.5 COMPARISON OF CENTRALISTIC ARRANGEMENTS FOR WATER SYSTEMS QUANTITY AND QUALITY MANAGEMENT

In this section, instruments for water quantity and quality management are compared. This section contains the comparison of only one category of instruments, namely centralistic instruments (for both water quantity and water quality management). The reason for this is that neither decentralised arrangements nor arrangements involving the economic evaluation of arrangements for water systems quality management were analysed explicitly. Insights about macro-level factors are discussed in the next section.

MESO-LEVEL ANALYSIS

Formal institutions

Organisation of water quantity and quality management

Whereas water quantity management has a very long tradition in The Netherlands, water quality management is of relatively recent date. The institutions for water quantity management, such as water boards, for a long time had full mandates for water quantity management. For this reason, water quantity management has been performed in an isolated manner by (public) water quantity specialists for a long period of time. Water quality management, from the onset, was much more a policy domain that was addressed by several types of public organisations at the same time, such as those concerned with public health, the environment, agriculture and nature management. This is also reflected in the formal institutions addressing water quality, which originate from several ministries (though

mainly from the Ministry of VROM) and the wide range of policy instruments and principles, to a greater or lesser extent aimed at protecting water quality. The fact that several organisations are involved in water quality management makes policy arrangements addressing these water quality issues a complex matter.

Legal framework

Centralistic water quality instruments are subject to stricter EU-regulations than centralistic water quantity instruments. A number of reasons may account for this. The first is that no large scale trading of 'free water' takes place among member states. For raw materials and products (inputs and outputs) of production chains subject to environmental quality instruments this is often the case, which means that they are subject to EU-regulations regarding government support and (EU-) internal market rules. A second reason is that activities causing pollution more often have trans-border effects than water quantity related activities, especially those related to water extraction (demand management)²⁰⁰. This means they are more likely to be regulated by EU-regulations. A third, related reason is that because of these trans-border characteristics and the existence of the EU-internal market, many environmentally polluting activities can best (most effectively and perhaps also most efficiently) be regulated via policy at EU-level. Of course, activities affecting water distribution among countries can and do have cross-border effects. This is especially true for the effects of upstream activities on downstream supply. For The Netherlands, however, this has not been a dominant policy issue in international negotiations in the past. In North-Western Europe, water quantity related concerns on a cross border/international river basin scale mainly relate to water excess, not to (potential) shortage. The introduction of the European Water Framework Directive (WFD), and the emphasis on the river basin approach in it, may result in some focus on international water quantity distribution and regulation.

MICRO-LEVEL ANALYSIS

Technical and political criteria

Simplicity and specificity

It can be argued that centralised water quantity instruments are in principle more simple than water quality instruments, since the good regulated is more homogeneous in nature (which is a pre-condition for transactions in perfect ('neo-classical') markets). Ground water use in turn can be more easily regulated via economic steering instruments than surface water use, since it is more easily excludable from use by actors that don't hold property rights. In water quality management, the goods and substances regulated are often diverse and are often produced via a wide range of processes, which makes the design of the instrument addressing these substances more difficult. Therefore, it can be expected that EIs in water quantity management can be more easily designed according to the theoretical preconditions of neo-classical economics than EIs for water quality management addressing diffuse pollution. The difficulty of designing centralistic economic instruments for diffuse

²⁰⁰ As a consequence, the focus of EU-water policy and regulations is on water quality management. Water quantity management issues in international river basins are largely left to the riparian states and any co-ordinating mechanisms they have erected.

pollution that comply with these theoretical preconditions may account for the popularity of CACs and SIs for addressing this issue.

SUMMARY

Stimulating and obstructing factors

A major obstacle for the introduction of centralistic economic steering instruments is the pervasive uncertainty about a number of aspects, such as the gravity of the problem (ontological discourse), the dose-effect relationship (idem) and the effectiveness and efficiency of the instruments (normative discourse). This uncertainty is more pervasive for issues with a high degree of complexity, such as most diffuse pollution. Therefore, issues with a smaller degree of complexity, such as ground water use, seem to be more suitable for this type of instrument. At present, the dominant strategic discourse with regard to diffuse pollution is about the use of suasive and command and control instruments. The dominant normative discourse in water quantity management is about regulating supply, not demand. This is reflected in a limited use of centralistic economic steering instruments in water systems management.

7.6 COMPARISON OF CENTRALISTIC AND DECENTRALISED ARRANGEMENTS

INTRODUCTION

This section contains a comparison of centralistic and decentralised arrangements for water management. Both categories of instruments were addressed in the discussion of instruments for water quantity management. The analysis of instruments for water quality management did not include an extended description of decentralised arrangements. Therefore, this subsection will contain an induced discussion and analysis based on the comparison of centralistic and decentralised arrangements for water quantity management, complemented with insights in centralistic arrangements for water quality management.

GENERAL CHARACTERISTICS

Purpose of the instruments

The centralistic instruments discussed in this thesis primarily intend to curb the use of a (scarce) natural resource or the buffer capacity of the environment, which should lead to a reduction of the negative effects of human activities on the environment, and thus an improvement of environmental quality. Another, major (but in principle secondary) goal is the raising of revenues, either for financing policy addressing these environmental issues, or for general purposes (greening of the tax system). The decentralised instruments can serve a broad number of goals, depending on the arrangement and the combination of land use functions. These goals include goals related to water management, such as retention and storage (reducing water supply to downstream areas in times of excess and enhancing water

supply, both in a quantitative and qualitative sense, in times of shortage), and revitalising the rural area (via water quantity and quality measures).

Level of application

The centralistic instruments discussed, especially those directed at diffuse sources of pollution, operate at the national level. A precondition for such instruments is that they, in principle, may not discriminate between various types of activities or groups of actors. This means that the instrument has to be designed in such a way that it is applicable to every situation. As such, it cannot take into account variations in exogenous factors, such as geophysical differences between areas and different types of water use. Decentralised instruments, on the other hand, operate at the regional or local level. The number of private actors directly involved and the geographical area under concern are much smaller than with centralistic instruments. Therefore, it is easier to take into account the specific interests of stakeholders and specific regional or local circumstances. This in general allows for more tailor made arrangements. The type of contracts in decentralised arrangements (incomplete contracts) allows for these tailor made approaches and for adaptations to changing circumstances. It can therefore be said that this type of instrument is inherently more flexible than centralistic instruments. Besides, for decentralised arrangements, the pool of potential instruments (and thus arrangements) is large.

MACRO-LEVEL ANALYSIS

Shock events and agenda setting

Since the near floods in 1993 and 1995 in the major rivers and a number of local floods by precipitation, flood protection is high on the political agenda. In 2003, a period of drought occurred, which resulted in a dyke breach in the secondary system. Yet, this effect of water shortage seems to receive much less structural attention than the threat of flooding due to excess water. Instruments that address water excess (such as the spatial measures for storage of peak flows) therefore in recent years have been given higher priority than the ones addressing water shortage (structural spatial measures for enhancement of water supply and measures limiting water use (demand management)). This may be explained by the fact that in history, dealing with excess water and flood risks has always been the central focus of water management in The Netherlands. At the same time, however, spatial measures in water quantity management aim at both retaining and storing excess water in times of high precipitation and enhancing supply for dry periods. So via spatial measures, policy for water shortage, and maybe also for water quality, can 'catch a ride' on the wave of attention for flood protection. This is not the case for demand management via centralistic instruments (which involves a range of economic steering instruments for both water quantity and quality management). This type of instruments is mainly stimulated by policy initiatives at the national and international level, such as greening of the tax system (framework act on taxes on an environmental basis) and EU-regulations for environmental and water policy.

Shock events versus creeping processes

Issues related to excess water and some water quality related issues (such as emission of pesticides) are much more accessible to the general public than other water quality related

issues, such as leaching of dangerous substances, and structural and permanent water quantity problems related to a shortage of water (desiccation, subsidence, inlet of water of a different quality). As was argued before, this accessibility and visibility to a large extent depends on the occurrence of shock events. As a consequence, it is easier for advocates of strict environmental policy to mobilise the general public for the acute, visible issues than for the creeping, non-visible ones. Water excess is easily regarded as a direct threat in several ways and water quality related issues are usually regarded as acute if they involve direct health risks. In contrast, structural phenomena related to water shortage and slow, creeping processes of diffuse pollution are not really an issue in society, and the debate about this issue remains largely confined to the scientific, administrative and political arenas. Long-term, creeping processes in water quality and quantity management thus easily escape public attention, although their consequences in the long-term may prove to be far more profound and fundamental. Centralised instruments often address environmental issues which are characterised by long-term, creeping processes such as diffuse pollution and desiccation, while decentralised arrangements often address issues that are characterised by occasional shock events. As a consequence, it is in general more difficult to keep political and societal attention focused on the former category of issues than on the latter.

Political modernisation

The main trend affecting centralistic arrangements is that of deregulation. Deregulation is used as an argument to redistribute accountability (both responsibility and liability) between state, society and the market. This mechanism can be observed in centralistic arrangements for both diffuse pollution and flood protection for the primary system. In policy regarding diffuse pollution, public authorities aim to do so via the story lines of corporate social responsibility and self monitoring (*verinnerlijking*). As a consequence, at the national level, suasive instruments are more popular than market based instruments. In flood protection, the story line is that the government cannot guarantee a hundred percent safety and that (therefore) part of the flood risks will have to be borne by private actors. This thought is shaped by the new safety strategy in which the presence of water is natural and society is designed and structured according to the awareness of this presence.

Although centralistic economic instruments in theory leave allocation of goods and services to the market (while 'only slightly' steering this allocative mechanism) and thus can be indicated as an instrument meant to lead to deregulation and liberalisation, in practice they are not perceived as such. One reason for this is that in reality government authorities carefully define the framework within which the market is free to allocate. Although decentralised instruments do not necessarily decrease centralistic government influence either, the position this centralistic government takes in the decision-making process about policymaking and implementation is perceived by other stakeholders as being different. In perceptions about these arrangements, the power is more evenly distributed among stakeholders, and they provide more room to manoeuvre for target groups. Centralistic economic instruments are generally perceived as top-down instruments implemented by a strongly regulative central government and may therefore not be popular instruments in the light of the trends in governance of deregulation, liberalisation and privatisation.

Changes as a result of the relation between policy domains

In recent years, several shifts in political attention for various water related policy issues have occurred. A number of shock events related to water quantity management and other macro-level developments (such as institutionalisation of environmental policy) have caused a shift in recent years from attention for water quality management to attention for water quantity management. At the same time, various developments in society and in water management have caused a shift in the normative discourse in water quantity management from technocratic approaches and demand management towards spatial approaches and supply management. The combination of these trends has resulted in a shift in attention from integration of the policy domains of water and environment to integration of water and spatial planning. Because of the regional scale of water systems and water quantity management, the integration of water and spatial planning inherently requires a different level of policymaking (regional and local, instead of national). This trend towards more regional and local arrangements is stimulated by the general trends towards deregulation (in line with the subsidiarity principle). Water management approaches at a different scale also brings along different types of policy instruments. Whereas in the relationship between water and the environment, the emphasis with economic instruments was on centralistic steering instruments, these types of instruments are not suitable for application in policy arrangements at a lower scale of governance, such as in the regional and local arrangements resulting from the integration of water and spatial planning. These new arrangements have led to a search for new policy instruments, which were found in subsidies, public-private partnerships and incomplete contracts.

MESO-LEVEL ANALYSIS

Informal institutions

Paradigms and related instruments

The type of policy instruments proposed in environmental and water policy depends on the dominant paradigm in society on the man-nature relationship. For example, subsidies for environmental innovations suggest dominance of the weak sustainability paradigm. The argument for this is that, since they cost public funds and don't generate them, they are necessarily marginal instruments. Subsidies are usually financed by general budgets, and therefore paid by 'the general tax payer'. Since this group of stakeholders is usually not part of a strong policy coalition, is not very well organised and represented and moreover is very heterogeneous, subsidies usually are not strongly opposed to. Subsidies allow existing, 'normal' production activities to continue their (more) polluting activities. Therefore, there are hardly any motives for economic actors operating these 'normal' production activities to oppose to this instrument and hardly any incentives to change behaviour. The same can be said about arrangements that indirectly (continue to) subsidise specific economic sectors, such as in the case of regional and local water quality management based on the weak sustainability paradigm, in which industry and citizens pay the majority of the costs for ambient water quality management, although these are for a major part caused by agriculture. An example of a (new) type of arrangement that operates within the existing paradigmatic framework are the decentralised management arrangements for water quantity management (BS- and type 2 PPS-arrangements). As was discussed before, in contrast to

this, decentralised arrangements for spatial development projects (type 1 PPS-arrangements) do allow for setting standards according to the extended polluter pays principle.

From the perspective of the presently dominant paradigm about the man-nature relationship, instruments based on the SPPP are less conflicting than instruments based on the EPPP, since the latter involve a larger departure from the existing distribution of property rights. For centralistic instruments (based on the EPPP) to be accepted by economic actors, a paradigm shift would be needed towards the paradigm eco-development, since in this paradigm, economy and environment are (often) not opposing interests, but mutually dependent and supportive interests, the co-operation between which can generate synergetic effects. Another paradigmatic aspect that may influence the acceptance of policy instruments is that centralistic instruments for environmental policy are strongly motivated by ideology, while decentralised arrangements are more pragmatic in nature. While ideological starting points will always be contested by opponents adhering other or no particular ideologies, the pragmatic approach may more easily gain support from stakeholders, and especially from target groups, amongst others because this approach is more likely to lead to opportunities for these target groups.

In case of realising a green tax system, environmentally friendly practices become much more the norm, while modernist production and consumption practices are treated as the exception (punished for polluting behaviour). This approach inclines towards a strong sustainability approach. Since the practice of green taxing is a more recent approach than subsidising, the approach has not developed strong enough story lines and sufficiently institutionalised policy arrangements yet to 'challenge' the more vested approach of subsidising in particular situations. It must be noted that many policymakers and scientists argue that target groups should be addressed through both negative and positive incentives (stick and carrot mechanism) and through a mix of different types of policy instruments (CACs, SIs and EIs). In case of applying a stick-and-carrot-mechanism, EIs giving a negative incentive will be needed to finance those that provide a positive incentive.

Problem ownership

Target groups of centralistic instruments usually don't regard themselves as problem owners of environmental pollution or damage. In most cases, they regard environmental policy primarily as a concern for government institutions, that mainly have negative effects on these target groups. This may be different for other types of policy instruments. SIs, for example, inherently imply communication with target groups of policy, which may contribute to awareness raising about environmentally adverse behaviour. CAC-instruments may also require contact and communication between government authorities and target groups, in case of (self-) monitoring and enforcement. Centralistic economic instruments are typically imposed on target groups by the central government without consent of these target groups and through fairly anonymous mechanisms. Because of a lack of (inherent) communication and education, these instruments may easily result in low awareness about their necessity and resulting low target group support. However, as some cases showed, this support may be substantially increased by involvement of target groups in decision-making processes, rebate of revenues and communication and education programmes. These aspects of involving target groups and other stakeholders in policymaking are inherently more present in decentralised arrangements. Besides, because these arrangements are often based on the

weak sustainability paradigm and/or involve clear advantages for private actors, there is less controversy with regard to problem ownership of private actors and the related negative incentives imposed on these actors by the government.

Formal institutions

Policy principles

As was mentioned in the theoretical chapter, centralistic instruments are based on the extended polluter pays principle (EPPP) and thus give a continuous incentive to limit the environmental burden of activities, even if the use of natural resources or the use of 'pollution absorption capacity' falls within legal boundaries. Decentralised instruments for water management arrangements (blue services and type 2 PPP-arrangements), on the other hand, are based on the Standard Polluter Pays Principle (SPPP). This principle means that actors using natural resources or 'pollution absorption capacity' no longer receive an incentive to reduce their environmental burden as soon as they operate within the boundaries set. This means that users/polluters that already operate within the boundaries can, in theory, increase their environmental burden up to the level of the boundary. In blue service- or PPP-arrangements for water management, private actors are even rewarded for efforts that go beyond those needed to stay just within the legal boundaries. This situation may substantially contribute to the acceptance of the instrument by the 'target groups'. Just as with positive centralistic incentives, however, these positive decentralised incentives cause a financing problem for public authorities, and a related equity question. These positive incentives are likely to be financed from the general budget, and thus (again) by the 'general (water) tax payer', while these 'general tax payers' may not always be the cost causers of the management measures, or the ones (directly) benefitting from the arrangement. When considering these arrangements, it should therefore always be kept in mind which actors pay and which benefit from the arrangement.

Legal framework

At the national level, centralised instruments are based on restrictive regulations²⁰¹ and on combined stick and carrot-mechanisms, while national policy facilitating decentralised instruments is more based on opportunities for local public authorities and private actors. For these types of arrangements, restrictive regulations mainly come from the EU-level. Both centralistic and decentralised instruments are influenced by regulations at the EU-level. The WFD is a potential stimulating factor for centralistic instruments directed at demand management. However, the unilateral implementation of centralistic instruments at the member state level is increasingly impeded by EU-rules on competition in the internal market. These rules don't allow member states to raise import taxes on products originating from other member states. Without such import taxes, domestic economic actors are expected by opponents to have a competitive disadvantage on the EU-market in case a (unilateral) centralistic instrument is implemented that gives a negative incentive on the use of certain environmentally adverse products or services. Other international stimuli for demand management measures are the proclamation of water as an economic good at the

²⁰¹ Acts like the *WVO* (surface water pollution act), *WM* (*Wet Milieubeheer*, Environmental management act), *WBB* (*Wet Bodembescherming*; Soil protection act), *Waterleidingwet* (Act on water works), etcetera.

Dublin conference in 1992²⁰² and the call for demand management measures by the World Bank (1993). However, these stimuli are policy principles and don't have a legal status.

As was mentioned above, decentralised instruments are also affected by EU-regulations, but in a different way. Two main types of regulations apply to these arrangements: regulations regarding government support to economic sectors and regulations regarding tendering procedures. The regulations regarding public tendering do not *per se* limit possibilities for setting up a PPP or blue service-arrangement. Blue service-arrangements are so location bound and dependent on specific actors (present landowners), that public tendering in the EU-internal market is not likely to be relevant. For PPP-arrangements (especially type 1), this may be the case, but it does not need to obstruct the realisation of such an arrangement. Regulations regarding government support, however, are more likely to impede the realisation of blue service- and PPP-arrangements. Payment by public authorities to private actors performing public management tasks may be regarded by the EU as state support. As was mentioned before (see chapter 5), the options within this framework have not been explored exhaustively yet.

Economic rules

Centralistic steering instruments aim to regulate the allocation of resources or environmental use space via the market mechanism. In principle, they are designed and meant to operate in a non-discriminatory way. When no exemptions are in place, they do not discriminate between actors operating in a specific market. Because of this non-discriminatory operation, they leave the functioning of the market mechanism (i.e. allocation based on perfect competition) as much in tact as possible. Most decentralised instruments, on the other hand, do not operate according to a competitive market, since measures are location- and actor-bound. In other words, in this 'market', all kinds of monopolies exist, such as the ones based on geographic characteristics of the arrangement. Therefore, potential suppliers of the service are quite specific and the pool of potential suppliers is limited. This is especially the case with services offered by existing landowners (dwellers). In case of a PPP in which nomadic private partners are involved (usually PPP-arrangements for project development), the market is more competitive on the supply side. Private actors for the supply of services can then be selected by a tendering mechanism, which has to abide by EU rules. Demand is usually limited to one or a few actors.

Contracts

As opposed to centralistic instruments, decentralised instruments are not based on the neo-classical school of economics and do not presume efficient allocation via the market mechanism, since the 'market' they operate in is far from a perfect one. Therefore, these instruments fit the new institutional school of economics, which assumes complex products and services, and therefore necessarily incomplete contracts between customers and suppliers. Blue service arrangements and PPP-arrangements may be regarded as instruments creating a market (for water management measures) or supporting specific

²⁰² International Conference on Water and the Environment (ICWE) in Dublin, Ireland, on 26 to 31 January 1992, principle no.4: 'Water has an economic value in all its competing uses and should be recognized as an economic good'.

products or services in a market (such as 'clean' agricultural practices) (see chapter 2). In case of PPP-arrangements for area development, the government is the demanding party, and competition can take place between private actors for the best offer to supply a good or service. In case of blue service-arrangements or type 2 PPP-arrangements, the potential suppliers are chosen by the demanding party (usually but not necessarily water managers) and the question is merely whether or not these potential suppliers accept the offer.

Guidelines and standardisation

For negative economic incentives, it is often the tax base and tax rate that have been standardised (for example in mass units of active ingredients or inhabitant equivalents). Specification (and thus standardisation) of the tax base (the activity subject to a levy and the specific variable the height of the levy is based on) fixes the type of (economic) instrument to be implemented. This may lead to the situation that certain effective location- or nation-specific approaches are not allowed (see for an example the MINAS-levy, discussed in the previous chapter) and that perverse incentives are given or fraudulent adaptations by target groups result. So standardisation of negative economic incentives may even inhibit efficient or effective, tailor-made approaches to issues of diffuse pollution. Whereas previously, this may have especially been an issue in the tuning of national and regional/local policy, at present, this process is now mainly taking place between EU- and Member State policy. As was mentioned before, standardisation processes relevant for decentralised arrangements mainly consist of the establishment at EU-level of Good Agricultural Practices. These GAP-standards help define whether private actors in decentralised arrangements are offered or offering a service or product. On the account of the above, it may be concluded that activities towards standardisation of policy at EU level seem to be positive (helpful) for decentralised arrangements, and may be either helpful or obstructing for centralistic arrangements, depending on the degree of concordance of nation state policy with EU policy.

Actors

Generally speaking, in centralistic arrangements there is a larger role for representative organisations (*maatschappelijk middenkader*)²⁰³ than in decentralised arrangements. In the latter, more opportunities exist for stakeholders to directly raise their voice in the decision-making process, which more resembles a direct democracy. In order for the decision-making process about centralistic arrangements to occur in a democratically representative fashion, it is therefore important for these representative organisations to have close contact with their grass roots and to have a clear picture of their opinions. Whether this is always the case is questionable. However, answering this question was not part of this study. The location specific application of both blue services and PPP-arrangements limits the number of potential actors involved in decision-making. This reduces the complexity of the initiative compared to centralistic instruments. This characteristic of these arrangements may give actors the feeling that they are part of and can influence the decision-making process, which is likely to generate trust and understanding.

²⁰³ Governance via arrangements involving mainly representative organisations is referred to as 'corporate governance' (see chapter 2 and Wilson, 1989).

Temporary commissions

The role of temporary commissions for the investigation of potential policy instruments can, but not necessarily does, play an important role in the choice of centralistic policy instruments. On the one hand, judgments by the commission about the feasibility or desirability of certain policy instruments are likely to enhance or reduce political effort to introduce these instruments. On the other hand, since the advice of commissions does not have a binding status, political opportunism may cause politicians to neglect the commission's advice. The actual influence of a commission's advice amongst others depends on the authority assigned to the commission. Another factor influencing the fate of the advice is the degree to which it fits the dominant (normative) discourse (concordance). In general, commissions installed by the houses of parliament have considerable authority. Often, most of the recommendations made by such commissions are adopted by the houses of parliament and the cabinet. Commissions installed by lower public authorities usually have less authority, and their recommendations and findings are more heavily contested.

Power and resources

The various types of instruments vary in the degree to which (specific types of) stakeholders can influence the decision-making process. The influence of actors involved in the design (preparation) of centralistic policy instruments depends on who is the initiator and which actors have an interest. According to an interviewee, in most cases a task force is erected that includes representatives of various stakeholder groups to ensure (direct) democratic legitimation. In some cases, however, these preparations are held in the administrative and scientific arenas, with the involvement of only a limited number of (mainly administrative and political) actors, and without representation of societal stakeholders. After preparation in the administrative and scientific arenas (supportive research and pre-selection), the instrument has to pass the democratic legitimisation process in the political arena. Target groups and other stakeholders (f.e. environmental NGOs) can influence this process via lobbying. The public, in general, does not play an important (direct) role in this process. The main ways citizens can influence the process is via representative organisations. Besides, the process of democratic decision-making in the lower house is to guarantee the representation of the people at large.

With regard to environmental economic instruments providing a negative incentive, there is an uneven representation of target groups paying for these instruments. Green taxes, for example, are paid by polluters, often being both producers and consumers. Producers are usually well organised and represented and part of strong policy coalitions. Besides, they can make extensive use of resources, such as financial ones, to back-up their lobbying activities in the political arena. This is not really the case for consumers. The stakeholder benefiting from this instrument are 'the general tax payer', through a reduction of general taxes, and society as a whole, benefiting from a cleaner environment. As was mentioned before, these stakeholders are less well organised to lobby for these advantages. Besides, a continuous ontological discourse takes place about the effects of pollution on the well being of society. In this discourse, consumers usually have more diverse and dispersed interests than producers.

With regard to the design of decentralised arrangements, it seems that a larger number of actors can be involved in various ways, such as via direct involvement in the arrangement, regular democratic representation, public hearings and objections and lobbying. The scale of

these arrangements is often such that people feel more involved than in case of centralistic arrangements. An important aspect of decentralised arrangements is that the power-relationship between public authorities and private actors is less hierarchical than with centralistic arrangements. Reasons for this more equal position are the fact that these arrangements in general require voluntary co-operation of private actors. Co-operation cannot be enforced, since private actors hold the property rights of a crucial resource for the arrangements, namely land. Voluntariness, and the automatically resulting position of stakeholders at the negotiating table may be an important advantage of decentralised arrangements over centralistic ones in terms of public and stakeholder support. In voluntary arrangements, because of a more equal distribution of power, public authorities have to operate much more carefully, and therefore have to be much more sensitive to the interests of private stakeholders. Once an agreement has been reached, however, there is a stronger guarantee for target group support. It must, however, always be kept well in mind which stakeholders are involved and (thus) which interests are represented in the negotiations and which are not. Voluntariness may also be an obstructing factor. This is mainly the case for management arrangements for which the co-operation of a (large) number of landowners is required in order for the arrangement to be effective and/or efficient. Centralistic economic instruments are not based on voluntary co-operation by target groups. In fact, positive (economic) incentives and suasive instruments, such as covenants, are the only other types of centralistic instrument that can be based on voluntary co-operation by target groups. Exactly because in case of centralistic instruments the central government can dispose of authority to derive power over private actors, these instruments may be rejected by target groups as being too authoritarian.

Discourse

Ontological discourse

With regard to centralistic instruments in water quantity management, the ontological discourse is dominated by the notion that water and ecosystems depending on it are scarce. With regard to decentralised instruments for water quantity management, scarcity not only relates to water, but also to space and public financial resources. This difference in perception of what goods and services are scarce influences the debate about the normative and strategic discourse. In case a larger number of goods and services are regarded as scarce, the decision-making process is likely to involve a larger number of interests, and therefore becomes more of a balancing act. In this balancing act, water is likely to be only one of the interests to be included in the decision-making, instead of the main interest.

Normative discourse and related policy paradigms

The normative discourse with regard to centralistic or decentralised instruments to a large extent revolves around the issue of fairness (from the point of view of the polluter or user pays) versus target group acceptance. The centralistic policy instruments studied in this thesis are based on negative incentives for activities that are considered undesirable from an environmental point of view. They aim at limiting supply of or demand for products or services that result from these activities. Decentralised spatial water quantity management, on the other hand, aims at enhancing the supply of water or limiting its potential damage by giving positive incentives. As was discussed before, policy instruments that stimulate positive activities in general are preferred by target groups to instruments that repress negative

activities. Therefore, it is likely that decentralised water quantity management measures generate a higher stakeholder support than centralised water quantity management measures (at least the type studied in this thesis, giving a negative incentive). However, the problem with positive incentives (also with centralistic instruments) is that these instruments are financed from a general budget, which is undesirable from the point of view of equity, since in this case, the actors causing undesirable effects are not the ones paying for it (in other words: the polluter or user does not pay).

The EU water framework directive mentions demand management measures and getting the prices right as strategies for 'more rational' use of the scarce resource of water. This would stimulate the application of centralistic demand management instruments for water quantity management. However, at the national and lower government levels, at this moment, supply management by means of spatial measures dominate the political and administrative debate. As a consequence, the political climate is favourable for decentralised spatial water (quantity) management measures (supply management). Besides, decentralised spatial water management arrangements fit the subsidiarity principle (formulated at EU-level) and the trend in political modernisation at the national level towards deregulation and privatisation. A reason for the popularity of decentralised arrangements could be that in these arrangements, no fundamental choices have to be made with regard to the distribution of property rights regarding natural resources and their use. Therefore, this new type of instrument fits the present Institutional Resource Regime (see chapter 3 and Varone et al., 2002).

MICRO-LEVEL ANALYSIS

General remarks

Balancing various technical and political criteria

Centralistic instruments often face the dilemma of finding an acceptable compromise between various criteria, such as specificity/discrimination, equity, fairness, administrative costs and perception costs. Sophisticated (discriminative and specific) instruments are more likely to prevent target group protests based on the polluter or user pays argument ('we are affected by the tax, but we are no polluter or user, or at least not to the degree other target groups are'). However, these sophisticated, discriminative instruments are more complicated and therefore usually encompass a higher administrative burden on both public authorities and target groups and are therefore less efficient. The reaction of stakeholders may vary and may relate to opposing characteristics. If taxes are very specific, target groups may object to the fact that they are the only actor group subject to the tax, or that they have to invest considerable resources to keep the administration of the tax. On the other hand, the more general the tax, the more target groups may argue that they should be excluded from the tax. As a consequence, there will always be a reason for some actors to object to a centralistic levy.

Flexibility and specificity

In principle, from the perspective of equity, centralistic instruments are not allowed to discriminate between target groups or types of activities addressed. The degree to which centralistic instruments can address specific sources of pollution is thus (very) limited.

Because of this limitation, centralistic instruments may often be perceived as too broad sweep and not relevant or fair with regard to specific types of use of natural resources or environmental buffer capacity. Any exemptions for specific types of water use or water pollution from whatever perspective (fairness, relevance, perception costs, etc.), compromise the universality and proper functioning of the centralistic instrument (i.e. distorts the market it operates in), and may therefore in turn cause counter-reactions by actors that are not exempted. In short, centralistic instruments have to balance continuously between general applicability (no discrimination) and specificity (relevance). In contrast, decentralised arrangements are usually more flexible (adaptable), since the institutions fixing the arrangement (contracts) can be more easily changed than those of centralistic arrangements (laws). However, even with decentralised arrangements, transaction costs for changing the institutional setting are still considerable.

Technical criteria

Cost-benefit balance and imponderabilia

Centralistic economic policy instruments for the environment have a lot to do with internalising (negative) external effects on the environment. Earlier, it was argued that for decentralised instruments, this is less the case, since they are largely based on the SPPP. At the national level, there is a plea for valuing *imponderabilia*, and thus for internalising external effects. At the regional and local level, however, centralistic instruments seem to be interpreted in a different way, namely as an instrument predominantly aimed at raising revenue. In chapter 4, it was observed that the paradigmatic views of the global, EU and national policy levels are largely in line, while relative to this, the regional and local level usually have a downward level of environmental ambition because of practical considerations and a different set of concerns.

Cost-effectiveness

Whether or not the new spatial approaches to water quantity management as discussed in this thesis are more cost-effective than centralised arrangements for water quantity management, may for a large part depend on the outcome of the discourse about property rights. At present, no dominant discourse exists yet in this respect, let alone that this discourse has resulted in clear rules of the game. The coming years will prove which story line will emerge as the dominant one, and thus how these arrangements will be designed. At present, it seems that property rights will largely remain intact. The main factor that may more fundamentally change property rights are EU-regulations regarding good agricultural practice and more stringent water and environmental quality.

Revenue raising characteristic

Centralistic economic steering instruments with a negative incentive to private actors are instruments that in the first place aim to have a regulative effect on the use of natural resources or environmental use space. However, as an (often considered desirable) side-effect, they also have a revenue raising characteristic for public budget. For this reason, these types of instruments can be expected to be preferred by the Ministry of Finance over instruments with a positive incentive (such as subsidies and blue services). Arrangements providing a positive incentive will thus always have to be compensated by revenue raising arrangements (either or not via a negative incentive to environmentally adverse activities).

However, this aspect does not seem to be a dominant criterion in the strategic discourse in the societal and political arenas about decentral arrangements. The general lack of attention in the public debate for this aspect of instruments giving positive incentives may be caused by unawareness or may be convenient for advocates of these instruments to consciously 'forget'. However, the aspect does play a role in the scientific and administrative arenas.

Equity

From an equity point of view (distribution of costs and benefits among groups of actors in society), instruments giving a negative incentive to economic actors (demand management instruments) are superior to the ones giving positive incentives (supply management instruments) because of the (stricter) application of the (extended) polluter pays principle and/or the user pays principle. Demand management measures negatively affect mainly target groups and related actors, while supply management measures negatively affect the general tax payer. However, whether or not the user and/or polluter pays principles are accepted as legitimate (and dominant) principles to judge the equity of a scheme depends on the actual and perceived distribution of rights to pollute and/or use natural resources. Considering the dominant perception about property rights to pollute and use environmental buffer capacity, chances of a stricter application of these principles are slim.

Dynamic incentive

Contrary to centralistic arrangements that operate according to the EPPP, decentralised arrangements do not automatically give (continuous) incentives to target groups to further reduce environmentally adverse activities. Such incentives can in principle be included in covenants and contracts, both for buyers and for suppliers. The very absence of a dynamic incentive may well account for the popularity of decentralised arrangements. The majority of private actors (especially target groups) usually regard centralistic policy instruments (the ones giving a negative incentive) as a burden, and not as an opportunity for innovation, although innovation through the dynamic incentive is regarded as one of the main positive effects of negative incentives²⁰⁴. However, the benefits due to innovative opportunities will (at first) only accrue to a small number of entrepreneurs, while the majority (main stream) of the target group will not be able to benefit at first. Only when innovative approaches gain ground because they become (more) standard practice (in other words: gain market share) or because incentives to adapt become sufficiently strong, are main stream economic actors likely to adjust to and possibly benefit from the innovation. Usually, a considerable 'initial threshold' exists for switching to innovative approaches. This threshold (required investments and related risks) is likely to deter (vested) economic interests. Therefore, public authorities should strive to take away these thresholds as much as possible.

Political criteria

Concordance

All centralistic instruments are based on a framework of CAC-instruments. In fact, a proper framework of environmental standards and a legal system to settle disputes are preconditions for a proper functioning of centralistic economic instruments. Besides

²⁰⁴ It must be noted that this characteristic of negative incentives is mainly regarded as an advantage by (some) public administrators, NGOs and scientists, and usually not by target groups.

depending on this 'backbone', economic instruments are usually regarded as part of a mix of instruments, including CACs, SIs and technological measures. In some cases, however, combining EIs with SIs or additional CACs is (at present) regarded as 'too much regulation'. Whether or not this is the case depends on the dominant normative and strategic discourses. Initiatives for EIs besides other instruments already in place are likely to be heavily disputed by target groups (and possibly other actors), especially when substantial uncertainty exists with regard to their (cost-) effectiveness and efficiency.

Stakeholder, target group and public support

In centralistic arrangements, stakeholder or target group support is less crucial for the successful implementation of an instrument than in (voluntary) decentralised arrangements. Off course, (ideally,) centralistic instruments are based on democratic legitimisation as well (via democratic representation in the lower house). However, the link between a lack of stakeholder group or public support and its consequences for the implementation of the instrument is less direct than in case of decentralised instruments, since the former are not based on voluntariness. For centralistic arrangements, however, a lack of target group support may have substantial consequences for the environmental and cost-effectiveness of the instrument, as a result of, for example, sabotage and fraud. Since both types of decentralised arrangements for water quantity management as discussed in this thesis involve positive incentives (business opportunities) for private parties, target group support is more likely to exist for these arrangements than for CAC-instruments or economic instruments involving negative incentives.

Intentionality

All centralistic economic instruments for environmental policy are subject to debate about intentionality. The center of debate in this respect is the question whether the instrument is intended as a revenue raising instrument or as an instrument aiming to establish a regulative effect. According to an interviewee at the Ministry of VROM, to circumvent this problem, centralistic levies are often legitimised both from the point of view of its environmental regulative effect and its revenue raising characteristic. The latter is done within the framework of the greening of the tax system, which legitimises revenue raising, since this shift (at least in theory) is compensated by tax alleviations on other activities. A major factor contributing to this debate is uncertainty in all three types of discourse. Opponents of centralistic arrangements use this doubt as a resource (story line in the discourse) to object to these arrangements. In this respect, opponents will often claim that the instrument is purely meant for fiscal purposes (the target group as 'milkcow').

For decentralised arrangements, such doubts about the intentionality of the arrangements do not exist, at least not with regard to blue services and PPP-arrangements for management. As was shown by the example of the Blauwe Stad, such doubts may exist with regard to PPP-arrangements for area development. This doubt (or scepticism) related to the distribution of costs and benefits between public and private parties, and thus to the spending of tax money. With decentralised instruments, the link between the arrangement and the effectiveness of the policy will in general be more straightforward and controllable by the public initiators and verifiable by the private actors involved. This may, however, be more related to the level at which the instrument is applied than to the type of instrument itself. At the national level, the (environmental) effectiveness of the policy instrument may

also be uncertain and difficult to predict and measure for suasive (such as covenants) or command and control instruments. However, because of the (more) participative nature of the process, transparency about the intentions of public authorities may in general be considered higher by stakeholders for suasive instruments, which may result in larger target group support. This may be the reason for favouring SIs at the national level.

Usefulness and necessity

Similar doubts from stakeholders (mainly target groups) as those regarding the intentionality of centralistic instruments are also likely to exist with regard to the usefulness and necessity of these instruments. These doubts relate to a difference in paradigmatic point of view between public authorities concerned with environmental policy on the one hand, and other public authorities and economic actors on the other. The latter group is likely to question the necessity and usefulness of instruments that operate according to the extended polluter pays principle. Firstly, the usefulness and necessity of extra measures and a continuous (dynamic) incentive will often be hard to prove, mainly because of pervasive uncertainties regarding the monitoring and calculation of the benefits of environmental policy. Secondly, a regulatory framework (CAC-instruments based on the SPPP) is often already in place, and extra policy instruments (especially those based on the EPPP) are considered to be too much regulation, too complicated and too damaging for the target group(s). Thirdly, target groups argue that additional environmental measures lead to exponentially rising marginal costs of environmental measures. Whether or not continuous efforts according to the EPPP are or are not regarded desirable is mainly a matter of paradigmatic perspective.

With regard to decentralised arrangements, similar scepticism is likely to exist with regard to the usefulness and necessity of spatial water management measures. This scepticism showed from the data regarding the Blauwe Stad-project. Turning land into water runs counter to the nature of the Dutch, especially those that cultivate the land. However, as showed from the official position of the *LTO* regarding blue services, the agri- and horticultural sectors are starting to get used to the idea of spatial water management services and are developing a business-like attitude towards it.

Sustainability

As was mentioned in the theoretical chapter, the concept of sustainability has many definitions and operationalisations. With regard to corporate social responsibility, usually three aspects of sustainability are mentioned: the economic, the social and the environmental (or ecological) aspect. There seems to be a considerable degree of consensus about this subdivision of the concept of sustainability. These aspects can be the starting point for assessing the sustainability of policy instruments. Centralistic economic policy instruments (especially the ones giving a negative incentive) in theory score well on the ecological dimension of sustainability, because of the dynamic incentive they provide. However, as was emphasised by an interviewee, they often score less well on the social dimension, especially regarding target group support. Through fraud and sabotage, this may in turn lead to reduced environmental effectiveness and therefore to a reduced score on the ecological dimension as well. Besides, if price elasticity is small, a dynamic incentive may not lead to the desired environmental effect. With regard to the economic dimension of sustainability, opinions about economic instruments diverge to a large degree. Vested interests often argue that economic instruments for environmental policy are not fair and

equitable and deteriorate the competitive position of economic sectors or the Dutch economy as a whole. Advocates of strong environmental policy emphasise the business and economic opportunities of environmental innovation and the general benefits to the economy of having healthy ecosystems and a healthy living environment. These positions strongly relate to the man-nature policy paradigm adhered to, as discussed in chapter 2.

In decentralised arrangements, the environmental or ecological dimension of sustainability depends on the type of measure taken. If measures aim at preventing floods, desiccation or water pollution in a structural manner, they may be regarded as ecologically sustainable. If they aim at mitigating these effects, they may contribute to policy goals, but they will not be very ecologically sustainable, since sustainable measures generally aim at preventing undesirable effects, instead of mitigating or compensating them. However, such mitigating measures may be more sustainable from the social and/or economic point of view than centralistic arrangements, or at least perceived as such by stakeholders.

Risks and uncertainty

General

The risk and uncertainty related to environmental effectiveness and a number of other criteria seem to be larger, or at least perceived as such, for centralistic arrangements than for decentralised arrangements. Generally speaking, centralistic economic instruments are accompanied by considerable uncertainty with regard to a considerable number of aspects (such as environmental effectiveness, necessity, undesired side effects, equity, fairness and intentionality). These uncertainties entail risks for both public and private parties and are therefore heavily debated and contested. The majority of centralistic arrangements is questioned with regard to their intentionality, because of uncertainty in all three levels of discourse. Uncertainties in the ontological discourse often relate to mechanisms like dose-effect relationships. Those in the normative discourse relate to issues such as the effectiveness of supply or demand management. Uncertainties about the environmental effectiveness and/or efficiency of centralistic instruments are part of the strategic discourse. All these uncertainties may be used by opponents as an argument to question the true intentions of the instrument.

Since decentralised arrangements are fairly new, not much experience exists with regard to their effects. Their effectiveness, however, in general does not seem to be doubted. Besides, depending on the design, the types of contracts involved in decentralised arrangements can be made inherently more flexible and therefore able to deal with uncertainties and changing insights (by formulating in the contract how to deal with unforeseen circumstances). In centralistic instruments, it is more difficult to deal with risks because of the 'one moment' introduction of an arrangement compared to possibilities for a stepwise introduction and evolution of decentralised arrangements. Besides, in decentral arrangements, risks can be addressed in transparent communication between actors. In centralised arrangements, design takes place in a more 'hidden' arena, which may create distrust among target groups, since they are not directly involved. The combination of all the aspects of uncertainty results in a generally lower support for centralised than for decentralised arrangements.

Environmental effectiveness risk

As was argued in the theoretical chapter, economic policy instruments for environmental policy entail an environmental effectiveness risk, since there is considerable uncertainty about the true effects of the instrument in reality. This effect depends on a number of factors, which are hard to predict in advance. The importance of the environmental effectiveness risk as a criterion in decision-making by various actors, as argued from a theoretical perspective, was confirmed by empirical data. However, this risk does not only count for centralistic instruments, but also for decentralised arrangements. The latter is the result of deregulation policy in spatial planning, which aims to provide the market with more freedom to realise private projects. According to Van Bommel et al. (2003), this reduces opportunities for realising public facilities, because private parties become less dependent on public parties for achieving their goals. However, the environmental effectiveness risk does not seem to be questioned very much in the discourse about these arrangements.

Risk of fraud

Besides the environmental effectiveness risk, centralistic instruments often entail a fraud-risk. This counts for both centralistic instruments for water quantity and for water quality management. For both types of instruments, the agricultural sector seems to be the economic sector with the highest chance of fraud. Two reasons may account for this. The first is that agricultural activities are dispersed and are therefore hard to monitor and control. The second argument, which may be used by the target group itself, is that profit margins in the agricultural sector have been marginalised and therefore, farmers cannot allow themselves financially to invest time and financial resources in alternative methods. Uncertainty and unawareness about the costs and benefits and (dis-) advantages of alternative methods may also prevent switching to more sustainable practices. However, this argument is not unique for the agricultural sector. Besides, it can be taken away by an intelligent design of arrangements addressing these issues. Awareness raising among private parties (via training, education and support) and financial or economic support play an important role in 'selling' sustainable alternatives.

Uncertainty about the institutional framework

With regard to decentral arrangements, at present, the largest uncertainty relates to the compatibility of these arrangements with EU regulations for competition and government support, especially with regard to (long-term) management arrangements. As long as this uncertainty remains, agreements are unlikely to be made on a large scale. Since the arrangements are relatively new, no comprehensive jurisdiction exists yet about which arrangements are allowed and which are not. Pioneer initiatives will need to provide more clarity on this point. Because of the risks private partners run in these pioneer initiatives, they are likely to be undertaken more easily if they are supported financially by public authorities.

SUMMARY: OPPORTUNITIES AND THREATS

When comparing centralistic and decentralised arrangements, a number of major differences can be observed. Firstly, decentralised management arrangements take the existing distribution of property rights as a starting point for determining who pays and who gets

paid. This is different for PPP-arrangements for development, since the amendment of the zoning plan is used as an opportunity to set new targets with regard to public facilities, including water management. Centralistic instruments operate according to the extended PPP, and therefore usually change property rights, since the existing situation is usually based on the standard PPP, or on no PPP at all. Secondly, the theory of decentralised arrangements is based on bounded rationality, transaction costs and risks. These arrangements thus inherently deal with imperfect situations. Theory behind centralistic instruments is in principle based on assumptions of perfection, and is therefore in principle less realistic. Based on these two differences, it may be expected that decentralised arrangements meet less resistance from target groups and may as a whole be more popular than centralistic arrangements. However, these instruments often operate on different issues, and therefore they should not be regarded as substitutes, but rather as complementary to each other.

Since decentralised instruments potentially serve a large number of purposes, the chance of finding a successful and feasible combination of land use functions is substantial and chances for a successful arrangement are as well. This is more true for PPP-arrangements than for blue services, since the options for land use combined with water management measures in the latter are usually limited to agricultural use or nature. The private actors to be involved in blue services arrangements (mostly farmers and nature managers) may not have a (clear) motive to get involved. The range of goals to be served by centralistic instruments is usually more limited (achieving an environmental effect, greening of the tax system, raising tax revenues or achieve innovation). Besides, some of these goals are less accepted as legitimate by society.

Application of centralistic economic instruments depends on many factors, such as the dominant normative discourse (limited or extended PPP), the Institutional Resource Regime (IRR) and consequences for competition with other EU Member states or with states outside the EU. Opponents of economic environmental instruments (based on the polluter pays principle) often use the criteria of equity and fairness to argue against these instruments. The role of science can be to study the validity of these claims and to study and present alternative approaches that may provide opportunities to meet the objections of the target groups. As was argued before, the competitiveness-argument can often be (partly) offset by a redirection of the revenues of a charge to the target group(s). This revenue rebate, however, often proves to be an important obstacle, since it is subject to EU regulations on competition and government support. The only way to get EU-approval for revenue rebate seems to be to standardise activities that are eligible for revenue rebate, such as certified sustainable products or production processes. This process of certification, however, poses major obstacles in itself and will require considerable time and resources.

According to an interviewee, centralistic economic instruments for environmental policy are considered by various actor groups in several arenas (mainly politicians, civil servants and target groups) as too centralistic, too broad sweep, and too complex from a political, technical and legal point of view. Meeting the theoretical preconditions for proper functioning of these instruments and political conditions at the same time is very difficult, if not impossible. The result of trying to match these diverging preconditions is likely to result in a compromise, and thus a reduced performance with regard to at least one criterion. Besides,

as showed from the discussion of centralistic instruments in chapters 5 and 6 and the comparison of these instruments with decentralised arrangements, there are always some groups of actors that find a reason to complain about centralistic instruments. This seems to be less the case with decentral arrangements.

7.7 COMPARISON OF STEERING INSTRUMENTS AND EVALUATION METHODS

In this subsection, economic policy instruments and economic evaluation methods in water systems management are compared. The category of economic policy instruments as described here includes both centralistic steering instruments and instruments in decentralised arrangements. The category of economic evaluation methods is represented by the SCBA as studied within the framework of the *Rivierenland*-study. The comparison of these categories thus includes all types of instruments and methods discussed in this thesis. As such, this section also serves as overall discussion and conclusion of this chapter.

GENERAL CHARACTERISTICS

Issue

The central issue with regard to the evaluation method as discussed in this thesis (chapter 5) is accommodating excess water (in the primary system). This can also be the issue for the decentralised instruments (in the secondary and/or tertiary system). Both approaches have in common that they do not necessarily look at quantitative aspects only, but may also address qualitative aspects (of water and the environment/landscape as a whole) and land use functions other than water storage. In other words, they aim to have an comprehensive (or integrated) approach. The centralistic instruments related to water quantity management addressed extraction of water from water systems (demand management) and have less to do with qualitative aspects of water management²⁰⁵, spatial planning and supply management. Most central instruments for addressing diffuse pollution addressed only one substance of a small group of substances. Centralistic economic instruments for water management are thus not very integrative in the sense of addressing various issues (in water management and other policy fields) at the same time. However, they do integrate the environmental aspect into the decision-making process of private actors.

Characteristics of the instrument

In centralistic approaches, the instrument is based on complete contracts. In decentralised arrangements, the basis is incomplete contracts. The method involved in the economic evaluation is a SCBA. The instruments in the three types of arrangements discussed here are thus quite different in nature. The common denominator is that all three arrangements in some way aim to incorporate (the value of) environmental externalities in economic decisions, either taken by public or private actors.

²⁰⁵ Except for an indirect relationship with the quality of terrestrial ecosystems, by addressing the policy issue of desiccation.

MACRO-LEVEL ANALYSIS

Developments in society

Trends in preferences, demands and desires

Trends in society towards more leisure time and resulting demand for nature and recreational facilities leads to changing demands for land use functions, especially in rural areas. Besides, this changing demand is also stimulated by conscious consumerism and the resulting demand for 'quality products'. Both trends favor integrated spatial approaches according to the 'room for water' policy. Conscious consumerism could in principle also support centralistic approaches that aim to internalise negative externalities on nature and the environment. However, this mechanism may be too complex to understand for many citizens/consumers. Besides, such approaches conflict with consumers' interest in cheap products and services. Therefore, 'conscious consumerism' can be regarded as an 'elastic luxury good', which (the majority of) consumers abandon as soon as it conflicts with fulfilling basic needs. Quality products and services resulting from integrated decentralised arrangements may also conflict with consumers' interest in cheap products and services, but contrary to 'regular water', these products and services have an explicit 'quality label' for which consumers may be more easily willing to pay. Water (both drinking water and surface water) is regarded as a basic good (showing low price-elasticity) for which people will be less willing to pay a higher price.

Another trend in society, which to a large extent is the result of centralistic, modernist and technocratic approaches to water management, is the decreased acceptance of water nuisance. Public water managers now aim to reverse this trend by introducing new water management approaches that blur the sharp distinction between dry and wet, that do not rely as much on centralistic and technocratic approaches and that do not guarantee a 100% protection against water nuisance. As was mentioned above, these approaches fit the trend of decentralisation and deregulation, which in this case may lead to cost reductions for public water managers. This strategy was a (more or less explicit) strategy in the Rivierenland study. Decentralised arrangements also operate in line with this principle. Centralistic steering instruments have a less clear relationship with this trend. In general, these instruments do not match with deregulation.

Changes from within

Transition to integrated water management

All arrangements described here to some extent contribute to integrated water management. The decentralised arrangements and the room for the river-approach in the Rivierenland-study (the spatial approaches) aim to integrate various water management activities (water quantity and quality management, groundwater and surface water management) and various (other) land use functions (agriculture, nature, recreation, water storage). Besides, especially the decentralised arrangements aim for an interactive approach, involving stakeholders and their resources. The centralistic arrangements aim to integrate nature and the environment into water management, by internalising external effects on the environment of water related activities into the price/costs of these activities. However, these arrangements do not involve stakeholders in decision-making to the degree that

decentralised arrangements do. Besides, nature and the environment may be regarded by target groups as elitist concerns and false legitimisations for policy instruments. So whereas centralistic arrangements may score higher on the ecological dimension of sustainability (because of the extended user/polluter pays principle), decentralised arrangements may score higher on the social and economic dimensions of sustainability/integration, at least from the perspective of private actors. As we have seen before, in water quantity management, there is a trend towards spatial, supply management approaches. In spatial planning as a whole, there is a trend towards multiple land use planning, which, by definition, is integrative in character (horizontal or diagonal integration). Besides, the decision-making processes for multiple land use planning are often bottom-up, open planning processes. These approaches may therefore score well on the criteria of interactiveness with society and economic revitalisation.

MESO-LEVEL ANALYSIS

Informal institutions

Culture

In all three categories of arrangements (in this case in the *Rivierenland*-study, the alternative approach is assumed), the aim is an 'ecologicalisation' of the economy/society. For the decentralised arrangements and the *Rivierenland*-study, the cultural (and paradigm) shift required is that from 'fighting against water' to 'living with water'. Areas that were once conquered on the 'eternal enemy', are (periodically or permanently) given back to this 'enemy'. Besides, this enemy should no longer be regarded as enemy, but as an ally. For the centralistic arrangements, the cultural shift is that from 'exploitation of water' to 'preservation of water' and 'protection of water dependent ecosystems'. Any arrangements that contribute to the ecologicalisation of the economy can be said to be integrative in character from the ecological perspective. Both the centralistic instruments and the *Rivierenland*-concept can be claimed to contribute to a cultural shift and (thus) to the process of ecologicalisation of the economy. Whether this also counts for decentralised arrangements depends on the type of polluter pays principle applied and the definition of good practices, as was argued before.

Problem ownership

For a long time, public authorities have been responsible for water management in all forms: protection against flooding, water level management for land use, provision of drinking water, collection and treatment of waste water, provision of sufficient surface water for various purposes. Since a few years, public water management organisations are trying to make private (groups of) actors share responsibilities for water management and the related risks and liabilities. One of the ways to achieve this is to make society more aware of the value of water, the costs of water management and water related risks (the illusion that safety can be guaranteed for 100 percent and the increasing risks due to continued investments in flood prone areas). Making private and other public actors (co-)responsible for certain water management tasks and liable for the consequences of too much, too little or too dirty water is a dominant story line about deregulation by water managers ('if society cuts the budget of public water management, we can no longer guarantee the quality of our services').

Procedural rules

For all three types of tools/instruments, procedural rules exist with regard to the decision-making process about implementation of either a policy approach or methods and instruments that are part of such an approach. Many of these procedural rules have even been laid down in public and private law. However, these formal institutions exist to a much smaller degree for the stages preceding the official democratic decision-making process. Informal procedural rules may exist, but in general these are non-transparent and therefore susceptible to arbitrariness by primary (initiating) actors. It cannot be told with certainty from the data of this thesis which type of arrangement, method or instrument is most subject to informal, undemocratic rules governing the policymaking process. Decentralised arrangements seem to be more susceptible for the corporate decision-making model and (thus) less based on majoritarian politics than centralistic arrangements. However, the need for a change in the zoning plan is likely to guarantee democratic decision-making in a number of these arrangements according to this model after all. Centralistic decisions, on the other hand, have to be approved by the Houses of Parliament, which should guarantee representative democratic decision-making. Whether this decision-making takes place on the basis of objective information, is however not always clear. Discourse about the need and urgency of certain policy programmes and measures, either or not backed up by public opinions, may play a crucial role in this arena. It was discussed in chapter 5 that measures in the room for river policy may be taken in diagonal arrangements, making use of institutions that allow for a shortened procedure²⁰⁶. The associated question is whether or not this leads to an erosion of democratic decision-making. The consequences for the ecological dimension of sustainability depends on the substance and organisation of the arrangement. However, the score of these arrangements with regard to the social dimension is not likely to be very high. All in all, untransparent procedures may be a threat to integrated water management, since they do not guarantee the representation of all interests in decision-making.

Formal institutions

Policy principles

As was discussed before, the decentralised arrangements are based on the SPPP, while centralised arrangements are based on the EPPP. Another way to put it is that centralistic instruments aim to internalise externalities in the price of goods (and thus in the market transaction), while decentralised instruments in general do not, or only to a limited degree. Whether an economic evaluation is performed according to the SPPP or EPPP depends very much on the types of costs and benefits included and the way environmental effects are valued. A societal cost-benefit analysis (SCBA), as in the Rivierenland-study, in principle aims to value all effects on society, thus including (positive and negative) effects on the environment. As such, it would operate according to the EPPP. However, compared to methods for calculation of direct costs and benefits, methods for valuation of indirect costs and benefits are underdeveloped and 'under-institutionalised', and, as a consequence, always risk to be under-represented in economic evaluations. Because methods for the valuation of the environment/nature have not been standardised yet, the costs of performing

²⁰⁶ It must be noted that some of the procedural rules discussed here have been institutionalized and could therefore be discussed in the part about 'formal institutions'. The reason for not doing so is a coherent presentation of the discussion.

such valuations are high, and the outcome is likely to be contested. These may be reasons not to engage in such valuations at all (see also Schuijt, 2003).

Institutionalisation

In all arrangements discussed in this thesis, the economic approach is subject of (heavy) debate. In centralistic arrangements, the focus in this debate is on the intentionality and effectiveness of an economic approach. In evaluations of projects and policy, the focus is on the content and role of the economic evaluation, especially with regard to the valuation of nature. In decentralised arrangements, questions are raised, mainly by private stakeholders, about the necessity of the arrangements. Besides, there is considerable skepticism towards the feasibility of the approach because of its relative novelty. Of the three approaches, economic evaluation is the oldest method (instrument) and is therefore well standardised and institutionalised. However, its role and content are being redefined, slowly leading to new standards and institutions. One of the major issues in this respect is the valuation of *imponderabilia*, such as nature and the value of ecosystems. As the word already indicates, the valuation of these imponderabilia has not been institutionalised yet and is therefore the main obstacle in making economic evaluations more integrated. For an extensive discussion of the valuation of *imponderabilia*, I refer to Schuijt (2003). Centralistic economic instruments for the environment have existed for a few decades as well. Therefore, the mechanisms and approaches are fairly well institutionalised and standardised. However, their application is still heavily contested. In other words, there is no consensus in the strategic discourse. Decentralised arrangements are not completely new either, but they are in the way they are being suggested and used in water management. Therefore, they have not been well institutionalised and standardised yet in this policy field. This situation causes substantial uncertainty about their applicability in water management and their effects on various groups of actors.

For both the national (EEM) and the regional/local level (decentralised instruments), in recent years the institutional framework was adapted to allow for spatial water quantity measures. At present, this is the dominant normative discourse in water systems quantity management. For centralised instruments, to a certain degree such an institutional framework was already in place. The recent discussion about the greening of the tax system has given this institutionalisation a new impulse, amongst others via the Act on Environmental Taxes (*Wet Belastingen op Milieugrondslag*).

Organisation and level of scale of water boards

One of the institutional consequences of both political modernisation and the transition towards integrated water management is the merger of water boards. This process has led to larger, more powerful organisations, both regarding their position towards other public authorities and towards private actors. In these larger organisations, there is likely to be more staff-like functions and more room for research and development. This may lead to more innovative management approaches initiated at the water board level, such as the decentralised arrangements. Besides, their organisation according to river sub-basins is expected to lead to a more integrated approach of water management and related problems. Consequences of this development for integrated economic evaluations are not directly clear. However, it can be stated that the lower the level at which such evaluations are performed, the narrower these evaluations are likely to be and the less likely they will be integrated in

character. Therefore, the merger of waterboards into larger organisations with a broader scope is likely to lead to wider and therefore more integrative evaluations.

Guidelines and standardisation

Guidelines and standardisation are part of the institutionalisation as mentioned above. Both SCBAs and decentralised arrangements are fairly new instruments in Dutch water management that have not been fully standardised yet. Therefore, the role of actors and the role of the instrument/method in the decision-making process is often not clear yet. Guidelines and standards (such as OEEI for economic evaluation and 'ideal contracts' for decentralised arrangements) are important institutions that fix (stabilise) the role and content of the economic instrument and the role of actors in the decision-making process. This standardisation can substantially reduce transaction costs because risk and uncertainty are reduced. At the same time, it fixes the position of stakeholders and their paradigmatic view on water management and the use of instruments. Therefore, stakeholders have a strong interest in influencing this process of standardisation. As we have seen in the discussion of various arrangements, the EU plays an important role in these processes of standardisation, both in a positive and a negative way.

Standardisation is not really an issue with regard to centralistic instruments. On the one hand, since these types of instruments have existed for quite some time, they have already been standardised to a substantial degree with regard to both process and 'standard' content. On the other hand, these instruments can be used for such a wide range of policy purposes that they can never be fully standardised. The same could be said about decentralised instruments and economic evaluation methods. However, with centralistic instruments, standardisation is guaranteed by laying down the instrument in a law. This is not the case for EEMs and decentralised arrangements. So far, formal institutions standardising the use of these instruments and methods in (integrated) water management are limited.

Discourse

Normative discourse

Not surprisingly, the normative discourses of decentralised instruments and that of the alternative approach to flood protection as presented in the *Rivierenland*-study show major similarities. Both aim at breaking down the sharp and rigid separation of land and water, of dry and wet, and at the combination of water retention and storage with other land use functions. Both also aim to provide for more (room for) water and therefore create opportunities to benefit from the positive effects of water. Both the decentralised instruments and the room for river approach emphasise the benefits of combining water management measures with taking measures to achieve other policy goals. Whereas with decentralised instruments, combinations can be made with various other land use functions (and thus policy goals), the emphasis with regard to room for rivers is on the combination of water quantity management and nature (development). A strong story line in the normative discourse regarding the room for river approach was the argument that river basins should be seen as one (eco-) system and as such could play an important role in the ecological main structure. This argument legitimised the plea for all kinds of measures to remove barriers, improve water quality and increase wetland area. A more flexible approach to permitting

other land use functions in the river beds could result in other function combinations, such as housing, provided that these land use functions are adapted to the primary functions of water retention, storage and discharge. Although policy for ground water extraction also has a clear link with nature, this link does not (as clearly) involve the ecological main structure. In many cases, the nature area affected is not part of the (envisioned) EMS. Even if it is, the link is not as clear (as visible and imaginable) in the debate about ground water use, and therefore, this motive is less appealing. Measures for 'room for the river' may therefore have a stronger ally in nature development than measures for fighting desiccation.

In water quantity management as a whole, the dominant normative discourse at the national level has, under influence of shock events (droughts and floods), in recent years shifted from limiting demand to enhancing supply (combined with retention and storage). In general, this discourse better suits target groups, since it may offer business opportunities, is based on voluntariness, and in general does not involve negative incentives, as is the case in (most) demand management measures. However, it may not suit the Ministry of Finance and the general tax payers, since it costs public money instead of raising it, if applied according to the standard polluter principle. Besides, it is not in line with the dominant trend at global and EU-level towards demand management measures. However, the influence of the EU on the normative discourse in water systems quantity management seems to be limited compared to water systems quality management. Therefore, the national government can largely choose its own course in this respect.

The role of science in the normative discourse regarding various approaches differs. In the (economic) evaluation of alternatives in the *Rivierenland*-study, there was a strong emphasis on scientific results (from various disciplines), since these were supposed to act as a legitimisation for the choice whether or not an alternative approach was useful and feasible. With regard to the decentralised instruments, the approach by public water managers is very careful, because of the voluntariness and the lack of legal authority of the water managers. In this process, therefore, (scientific) studies about the feasibility and usefulness of the instruments play an important role for the legitimisation process as well. With regard to the example studied for centralised instruments, the political and ideological drive, rather than scientific information, seems to have played a dominant role in the decision-making process. A cautious, step by step approach via legitimisation by (scientific) research would have taken too much time and would have caused too much debate to be able to introduce the instrument within the period of governance of the favourable administration. Besides, in these arrangements, the government authority is less directly dependent on private actors for the success of the arrangement. However, the arrangement needs to be introduced in such a way as to prevent heavy target group protests. The strategy therefore was to bring forward several arguments at the same time to legitimise the instrument ('covering bets').

Scientific discourse

With regard to all three types of methods and instruments, a scientific discourse takes place about economic evaluation of policy approaches (related to water and the environment), although for one instrument more explicitly than for the other. This includes activities such as the valuation of costs of damage to the environment, the benefits of healthy (aquatic) ecosystems and the calculation of cost-effectiveness. For decentralised arrangements, especially PPP-arrangements, the focus is on calculating and monetising the benefits to

nature of new water quantity management approaches and the benefits of nature for society (see, f.e. Brouwer et al., 2003). For centralistic instruments, the emphasis is on calculating the cost-effectiveness of environmental policy. Compared to the former, the policy goal is given, and the economic evaluation therefore does not consider the benefits of the policy. In the economic evaluation of measures regarding the 'room for rivers'-policy, the aim is to be comprehensive, by valuing the costs of activities that damage the environment, the costs of activities that aim to restore the environment and the benefits of healthy (aquatic) ecosystems. This is a matter of perspective, since the costs of one alternative can be regarded as the benefits of another and vice versa (in other words, the costs and benefits are always relative to a reference situation)²⁰⁷. It can be stated that for all of these methods for economic (e)valuation of environmental effects, a heavy scientific debate is taking place with regard to their content and their role in decision-making processes in policy. As a consequence, none of these methods for economic (e)valuation of environmental effects have been standardised for or have become standard elements of (economic) policy evaluation yet. At present, therefore, the interests represented by 'traditional' economic evaluations are still in a strong position (in the center of policy arrangements). However, the trend is that ever more studies focus on the economic (e)valuation of effects on the environment and that, as a consequence, economic valuation of nature is taking an increasingly important place in economic policy evaluation.

Actors and motives

The actors involved in each of the policy arrangements differ because of the differences in issue, discourse and scale, but most notably because of the stage of the decision-making process. Most of the centralistic instruments discussed have been implemented, and therefore, target groups and other stakeholders, their positions and reaction are not hypothetical. The decentralised instruments, in general, are in an exploratory or preparatory stage, but with serious intentions. In some cases, these arrangements have already been implemented. So although in most cases, the instrument is not in place yet, stakeholders are involved in decision-making, and they will realise that intentions are serious. One could therefore say that their reactions are 'revealed preferences' (how people really react) and not 'stated preferences' (how people say they will react). The Rivierenland-study is the most hypothetical arrangement of the three types compared here. For that reason, and because of the potentially controversial ideas of the approach, the number of actors involved by the initiator is still rather limited, involving mainly actors from the political, administrative and scientific arenas and not (or not many) societal and economic actors. Besides, the preferences of the actors involved are hypothetical, and therefore stated preferences.

Agenda setting

Which actors are involved in the decision-making about the design of the policy arrangement and the policy instruments in it depends, amongst others, on the mechanism for agenda setting. Both the decentralised instruments and the Rivierenland-study are the result of shock events that mobilised the societal, political and administrative arenas. The reaction to these shock events consisted of two types of measures: short term and long-term measures. The short term measures were technocratic measures, which served the purpose of

²⁰⁷ For a discussion of the dimensions of a (comprehensive) economic evaluation of flood protection measures within the Rivierenland-study, see Boot (2001).

enhancing the feeling in society of control over and protection from the water system, according to the existing dominant paradigm. For the Rivierenland-study, this meant increasing the safety standard of the existing defense structure of dykes and dams, and at the same time increasing the feeling of safety in society through these measures. For local water nuisance, this meant measures like increasing pumping capacity to mitigate the effects and improve meteorological warning systems so that preventative measures could be taken, such as lowering the water level in a polder in anticipation of heavy precipitation.

After this stage of short term technocratic measures to 'restore order' (both technically and mentally), parties started thinking about long-term, structural approaches towards the problem. Since society was somewhat put at ease by means of the short term measures, the issues did not occupy a high position on the societal agenda anymore. This gave the administrative, political and scientific arenas the opportunity to develop a long-term approach in relatively quiet circumstances (little media attention and a low position on the societal agenda). This was especially convenient for controversial approaches that would stir society. This seems to be more the case for safety approaches towards river flooding than for policy towards local water nuisance, since river flooding is more life threatening and the proposed new strategy has larger consequences. As a consequence, private stakeholders seem to be more involved by water management authorities in local approaches than in case of structural approaches towards river flooding. At the same time, however, water managers (at the national level) want to increase awareness in society about changing circumstances and changing approaches and philosophies about water management, such as the room for water approach and the message that the defense system does not guarantee a hundred percent protection from flooding. So far, this is done mainly through information campaigns that focus on (the less controversial) local water retention and storage measures.

The centralistic instruments of a ground water extraction tax resulted from periods of high attention for environmental problems in the political and scientific arenas, especially for desiccation. In this debate, a considerable consensus seems to exist about the ontological discourse. Contrary to the flooding issue, the desiccation issue was not brought to the attention of the societal arena through a shock effect, at least not one with a similar impact. Information about the problem of desiccation did reach the societal arena via (alarming) scientific reports, but the sense of urgency in society to do something about this issue was not as widespread as with regard to the threat of flooding. As a consequence, the debate about the normative and strategic discourse was mainly held in the political, administrative and scientific arenas. In the period the instrument was introduced, a political climate existed that favoured centralistic economic instruments for environmental policy. The political actors in favour of a ground water extraction tax seem to have benefited from that climate and from the fact that attention in the societal arena for this issue (from advocates, but especially from opponents) was relatively low. The limited degree of organisation and representation of consumer interests with regard to this issue also enabled producers of drinking water to transfer the burden of the tax to end users. The example of the ground water extraction tax shows that political attention for creeping environmental problems is crucial for introducing environmental taxes. This attention can be drawn by continued attention to these problems in the scientific and societal arenas. Besides, such instruments can be stimulated by framework acts about greening of the tax system and entrepreneurship in the political arena.

Intermediary organisations

With regard to all types of arrangements, intermediary organisations (can) play an important role. The types of organisations and their roles differ mainly according to the level at which the instruments are introduced. Stakeholders may have acquired a position in the negotiations themselves or they may have been involved by the initiator for specific reasons (resources, legitimisation). At the national level (CEIs), the former is more often the case than the latter. The stakeholders involved in these arrangements usually created and applied their own resources to gain a stronger position in the debate/negotiations. An example of such a resource is knowledge created by environmental NGOs with regard to the effects of a policy measure or programme on the environment. At the regional or local level, it is more likely that stakeholders are involved because of specific resources, without which the initiative cannot succeed. In other words, at the local level, stakeholders often have a 'natural' position at the negotiating table, while at the national level, (more) stakeholders will have an 'acquired' position. The natural position of the stakeholders at the regional or local level, combined with the voluntariness of the arrangement, automatically gives these stakeholders a stronger position in the negotiations. At the local or regional level, because of these required resources, stakeholder-representative organisations may play an important role in constructing effective and efficient arrangements. An example is the involvement of a farmer's nature organisation, which can act as an intermediary between water managers and individual farmers. This position of mediation may be performed by organisations that are involved from a different, purely commercial perspective, such as banks, insurance companies and consultancies. Whereas landowners and their representatives have a natural position in the arrangement, these organisations have an acquired position. Another distinction is that the former are dwellers and the latter are nomads (see Van Bommel et al. (2003)). Dwellers may be more easily accepted by the general public (which are also dwellers) as negotiating party than nomads. Generally speaking, in centralistic arrangements, intermediary organisations play a role in the process of legitimisation via the corporate model of governance. These are acquired rather than natural positions.

Representative organisations and grass roots

For all types of arrangements, it seems that representative organisations do not dare to take radical positions because of the fear of losing grass root support. This is more the case if these grass roots have diverging interests. In case of centralistic instruments, for example, the grass roots of environmental and nature NGOs at the same time are consumers of drinking water. Therefore, these NGOs will be careful to ask for tax levels high enough to achieve a significant effect. In case of the Rivierenland-study, environmental and nature NGOs may not want to take an extreme position with regard to room for the river (such as reclaiming land for the flood plain) because it needs a coalition with local citizen/inhabitant organisations. With regard to decentralised instruments, NGOs in principle may favour spatial measures over technical ones, but on the other hand may fear loss of ecological quality of nature areas (and perhaps as a consequence local support of grass roots). With regard to economic actors (industry, farmers), (primary) interests are usually more straightforward, and therefore, positions of representative organisations may be more extreme. However, with regard to decentralised arrangements, various, diverging agricultural interests may play a role. On the one hand, these arrangements may be regarded as a business opportunity and a chance to diversify business activities towards biological farming, while on the other hand, they may be regarded as a threat to (traditional) agriculture. The attitude towards

these instruments depends on the individual farmer's belief system and factors influencing this belief system. The interests of farmers with regard to centralised instruments are likely to be more straightforward (i.e. opposed to these instruments). All in all, it seems that in centralised arrangements, representative organisations take a more formal position according to their traditional interests than in decentralised arrangements. In the latter, the interests of actors, and the representation of these interests by representative organisations depend more on case-specific factors. It can also be concluded that, generally speaking, representative organisations of opponents of any arrangement can take more radical positions in the debate than advocates, because the latter usually have grass roots with more dispersed interests and a less direct interest in the issue at hand.

Power and resources

In the spatial approaches (decentralised arrangements and the Rivierenland-study), a specific category of private actors possesses an important resource for realising water management measures, namely land. This resource is usually not relevant in arrangements involving centralistic steering instruments. With regard to spatial water quantity measures for the primary system (f.e. measures according to 'room for river'-policy), it will be easier to expropriate land from private parties than in decentralised arrangements, where effects of floods are more local and a less direct threat for human lives. For measures in the primary system, special laws and procedures exist that authorise the central government to expropriate land for public measures of 'paramount importance for society' (*groot maatschappelijk belang*). One such instrument is the PKB (see also chapter 5).

In general, centralistic instruments are more top-down than decentralised ones. In centralistic arrangements, once agreed by the houses of parliament, the central government has more power to impose instruments on target groups. At the same time, this top-down approach is more likely to raise target group protest and sabotage, which hinders implementation. Economic sectors being target groups of centralistic instruments can use their importance for the national economy to object to these instruments. Citizens usually don't have such resources to directly oppose to or support these arrangements and instruments being part of it. They often can only indirectly influence the design and implementation of these arrangements and instruments via protests, legal procedures or elections. The construction of decentralised arrangements may take more time because of negotiations without a clear power-advantages of government authorities. On the other hand, once an agreement is made, chances of successful implementation are substantially larger, since the outcome of the process is supported by all negotiating parties.

Scientific information

In the Rivierenland-study, scientific information (from various disciplines) is expected by the initiating parties (national water management authorities) to be an important resource for legitimising the 'room for the river'-approach. This seems to be less the case in the other arrangements. In the ground water extraction tax, political will or preference seems to have played a dominant role over scientific information. In the decentralised arrangements, economic opportunities seem to be a dominant factor in the success of the arrangement. One reason that scientific information is regarded as more important in the Rivierenland-study than in the other arrangements is that the consequences for society as a whole of the extreme form of the 'room for the river'-policy are substantial. This approach would entail

basing river management on a different philosophy, with the corresponding changes in policy paradigms, principles, and, last but not least, a redefinition of property rights. The other arrangements discussed in this thesis may also lead to a change in property rights, but not as fundamentally as in case of the 'room for the river'-concept as studied in the *Rivierenland*-study. With regard to scientific information, authority plays an important role as well. The central government (often the cabinet) attributes scientific authority to specific (semi-) governmental institutes. The fact that the central government appoints the scientific authority can influence the setting of scientific studies, and thus the outcome of the scientific legitimisation process. For example, the official method for SCBA of large public infra-structural projects is based on studies from (semi-) governmental institutions such as the CPB and NEI/Ecorys²⁰⁸. The (neo-classical) approach of these institutes is decisive for the way the economic evaluation of project alternatives is performed.

Authority

With regard to spatial measures for water quantity management, the decision-making process of measures for the primary water system is much more hierarchical than that of measures for the secondary and tertiary system. The difference between decentralised arrangements and (centralistic) spatial approaches to the primary water system is the relationship between the responsible public water management agency and other stakeholders. In the former, public authority is used to force measures upon stakeholders, while in the latter, measures are more often based on voluntariness and agreement. The main reason for this difference in the use of public authority is the potential consequences of the (lack of) measures in both systems and related responsibilities and accountability. Such failure in the primary system may cause casualties, whereas in secondary and tertiary systems, damage is likely to be only material (and perhaps emotional and psychological). Since with regard to measures for the primary system, public authorities do not want to take any risks²⁰⁹ (because of liability for damage), no arrangements are constructed in which private partners perform water management measures for which they are paid or compensated (such as blue services). Therefore, these private actors often do not have a direct interest in these approaches.

With regard to centralistic EIs for water management, the following remarks can be made: under normal conditions, the regime regulating extraction of ground water is top-down in nature (because of the centralistic EI in place), but based on choice (the economic mechanism). The extraction of surface water within certain limits is free, while large extractions are subject to a licence. In times of drought, both activities may become subject to direct centralistic regulation via specific command and control-instruments for emergency situations. Centralistic arrangements addressing diffuse pollution are also typically top-down in nature. As was mentioned before, because of fixation in a law, there is little room for input by target groups and tailor-made specifications of the instruments.

²⁰⁸ CPB stands for *Centraal PlanBureau* (Central Planning Bureau). This is a government institution. NEI stands for *Nederlands Economisch Instituut* (Dutch Economic Institute). This formerly public institute was privatised in recent years and renamed Ecorys.

²⁰⁹ The involvement of private actors in flood protection may (be perceived to) reduce the dependability of the defence system.

Differences between the types of arrangement studied in the use of public authority are thus large. In PPP-arrangements, municipalities have a strong position based on public authority, because they can determine the content of the (new) zoning plan. In these arrangements, water boards cannot make direct legally enforceable claims. For the representation of (spatial) water interests, they depend on the provincial authority, which judges the zoning plan. The same counts for blue service-arrangements. In centralistic arrangements involving economic steering instruments, the main authority lies with the Lower House, which approves or rejects laws and regulations. The same counts for programmes for the primary system as studied in the Rivierenland-study. In most cases, decisions regarding this issue are the result of shortened planning processes, with limited occasions for public hearings and reduced possibilities for legal procedures. The Rivierenland-study thus takes a somewhat intermediary position between decentral and centralistic arrangements in the use of authority. On the one hand, the central government tries to make decisions according to an open planning process, while on the other hand, it may fall back on authoritative instruments to enforce arrangements in case such open planning processes fail.

MICRO-LEVEL ANALYSIS

General criteria

The interdepartmental task-force studying options for greening of the tax system screened alternative instruments on three main criteria: economic effects (including distributional effects), environmental effects and consequences for the state budget. These criteria were thus regarded as the most important criteria for centralistic EIs addressing diffuse pollution. The use of these criteria for the screening of schemes can be regarded as an informal institution for policy evaluation. However, focusing too much on these criteria alone may lead to a narrow perception of factors influencing the acceptance of the arrangement. They are merely technical factors that do not tell anything about the political and societal factors in the decision-making context these instruments are situated in.

Technical characteristics

Cost-benefit balance

Spatial projects in water quantity management usually have a negative cost-benefit balance on the short term for two main reasons: destruction of existing capital and underestimation of benefits. Estimations of costs due to destruction of capital have been well standardised and institutionalised. Methods for the estimation of benefits of water systems and water management have not. Therefore, the result is usually large uncertainty about and underestimation of these benefits. The same can be said about centralistic instruments. The costs of these instruments for target groups and for the administration are relatively direct costs and are thus well standardised. At present, however, the benefits to the environment and future generations cannot be calculated with standardised methods. Besides, they often fall outside the scope of effects that can be expressed in monetary terms. As a consequence, cost-benefit calculations (of both private and public activities) tend to underestimate the benefits of a healthy environment and thus of environmental policy, including instruments for environmental policy. Methodological obstacles for economic valuation of the benefits to

society of healthy ecosystems thus substantially reduce the 'integrativeness' of economic instruments and methods.

So far, not much experience exists with regard to CBAs or CEAs of decentralised arrangements. Because of their smaller scale, calculations of especially the cost side may be more simple. As was observed before, the (monetary) benefits of such arrangements are usually not calculated directly. Instead, the costs of guaranteeing a certain environmental quality is taken as a starting point for calculating the feasibility (in terms of cost-effectiveness or cost-benefit balance over the total of profitable and non-profitable functions) of such arrangements.

Cost-effectiveness and efficiency

Decentralised arrangements are, by combining land use functions, expected to lead to cost-effective water management and cost-effective terrain management and land use. Besides, they are expected to lead to efficient use of the scarce resource 'land'. Alleged advantages of decentralised arrangements over technical measures are that they lead to reduced flood risks, liability and maintenance costs and efforts, and higher dependability and robustness. The latter characteristics refer to the expectation that these approaches are less dependent on human interference in the system, and therefore less prone to human failure.

(Environmental) effectiveness

For centralised arrangements, the (environmental) effectiveness is one of the heaviest debated criteria (see chapter 2 about the environmental effectiveness risk), because of limited price-elasticity, and because of other factors, such as fraud and unintended side-effects. Whereas many obstacles may be circumvented by intelligent design, one of the most important, if not the most important factor, price-elasticity, is to a large extent a given, independent variable. Opponents argue that a (sophisticated, discriminative) permit policy combined with education and training is probably a more environmentally effective strategy to reduce resource use. Centralistic economic instruments can be further undermined in their environmental effectiveness by exemptions of specific categories of users or activities. These exemptions are nevertheless commonplace. Exemptions and technical adaptations are often the result of protests by specific target groups or other opponents, using a variety of arguments. Clever design of the instruments, for example by a good regulation for the rebate of revenues, can often prevent that such compromises have to be made.

The effectiveness of the 'room for river'-approach cannot be assessed yet, because since the introduction of the approach, no critical situations have occurred yet. Besides, so far, only a limited number of measures within this programme have been executed. The expectation is that it will be an effective approach with regard to flood protection. Besides, it is expected to be environmentally effective as well, since this approach intends to strengthen aquatic ecosystems and the ecological main structure. Whether it will also be a cost-effective approach remains unanswered as yet. The room for water approach at the regional and local scale is expected to be both an effective and a cost-effective approach. However, data about the (environmental) effectiveness of decentralised arrangements for water systems quantity management are not available yet, since the arrangements are rather new.

With regard to integrated water management, a distinction must be made between environmental effectiveness, effectiveness of reaching other goals and cost-effectiveness. Environmental effectiveness was identified as a primary goal of integrated water management, while cost-effectiveness was regarded as a derived, secondary goal. Whether the effectiveness of reaching other than environmental goals contributes to integrated water management, mainly depends on the way in which this goal is achieved. For example, in this respect, a distinction can be made between arrangements aiming at structural improvement of the water management situation and arrangements aiming at temporary solutions to acute water management issues, the former on principle being more sustainable than the latter.

Equity

The distribution of costs and benefits between target groups (equity criterion) is more an issue in centralistic arrangements, since these are general, broad sweep instruments, which often create (unintended) side-effects. Besides, as showed from this thesis, they are often not equitable due to (large scale) exemptions. Equity can also be an issue in spatial arrangements, especially with regard to the distribution of costs and benefits between public and private parties. Because of the long-term in which effects take place, in the Rivierenland-study intergenerational equity issues play an important role as well. This criterion does not seem to play a large role in the debate about the ground water tax. Neither does it seem to play a (large) role in decentralised spatial arrangements. The equity criterion relates to the comprehensive balancing of interests. Centralistic EIs and the Rivierenland-concept primarily aim to internalise underrepresented interests, such as nature and 'citizens of The Netherlands', while in decentralised arrangements the discourse about equity is dominated by fairness issues related to primary actors. Therefore, in these arrangements, the danger exists of loosing sight of secondary (and underrepresented) interests. For centralistic EIs and the Rivierenland-concept, the danger is the other way around, namely that the focus will be placed so much on the ecological dimension that the social dimension is lost out of sight.

Compensation

For both the decentralised instruments and the EEM, present land use functions (disposition and use rights) act as starting point for establishing the amount of compensation for damage due to the (potential) water storage. For the centralised instruments compensation does not seem to be a direct issue, since property rights are changed by a top-down mechanism. However, for these instruments, exemptions and tariff differentiations may act as an equivalent of compensation to deal with negative effects of a measure for specific groups of stakeholders. Compensation (in whatever form, such as actual compensation, exemptions or rebate of revenues) is an important issue for every arrangement studied in this thesis from the perspective of stakeholder support. From the study by ECOTEC (1999), it showed that rebate of revenue of centralistic taxes and charges improves target group support. As we have seen before, when designed well, the rebate scheme can give an extra incentive towards innovation as well. Also with regard to (centralistic or decentralised) spatial water management measures, adequate compensation of those who suffer negative effects of measures is an important aspect for public and stakeholder support for the arrangement. Generally speaking, equity and compensation are criteria for decision-making that are strongly related to stakeholder support, and thus to the socio-economic dimension of

sustainability. However, compensation may also relate to the ecological dimension, in case nature-compensation is at stake.

Flexibility

Flexibility is a central criterion in the *Rivierenland*-study. In the study about economic evaluation of alternatives, this criterion was considered important with regard to avoiding high sunk costs. Decentralised spatial arrangements vary with regard to the degree of flexibility. Centralistic EIs are not very flexible, since stipulations about the scheme have been laid down in law. Generally speaking, arrangements aiming at structural, long-term improvement of water management (such as the *Rivierenland*-concept, management agreements via blue services or PPP-arrangements and centralistic EIs) are less flexible than arrangements aimed at short term measures and effects (such as peak storage as a blue service and PPP-arrangements for project development). In fact, certain guarantees need to be given in the former in order to reduce risks for actors engaging in the arrangement. This does not necessarily need to be a problem, as long as these measures do not result in massive sunk costs. Therefore, one could say that the arrangements aimed at long-term effects would need to be as flexible as possible within the guarantees for continuity provided by the agreement. Since contracts are more easily (lower costs) adapted than laws, decentralised arrangements for water management can be considered more flexible than the arrangements involving centralistic EIs or the *Rivierenland*-concept.

Transparency

Spatial arrangements, and especially decentralised ones, are likely to score higher with regard to (the perception of) transparency than non-spatial ones. Two reasons may explain this. The first is that the scale of the arrangements is smaller, which makes them more accessible for direct (local) stakeholders. Secondly, the decision-making process is a negotiating process based on voluntariness, in which the public authorities do not have a strongly dominant position. The *Rivierenland*-study takes a somewhat intermediate position, since it is a spatial, but centralistic arrangement. On the one hand, as was stated before, it aims to be an open planning process, comparable to decentralised arrangements. On the other, the scale is much larger, which may reduce accessibility to primary public actors. Besides, the dominance of the (responsibility for the) safety aspect may legitimise a top-down and somewhat 'fenced-off' decision-making process.

Dynamic incentive and innovation

All three types of instruments discussed in this subsection in some way (try to) stimulate innovation, either in a direct or indirect way. Centralised instruments aim to achieve this by changing the relative prices of goods and by providing a dynamic incentive. In theory, centralistic economic steering instruments can even provide a double incentive, by giving a negative incentive to undesirable activities, combined with a rebate of revenues to desirable activities (positive incentive). However, as was discussed before, technical, political and institutional obstacles often prevent such ideal schemes. Decentralised instruments may lead to innovation because of new normative discourses about water ('water as a service' or 'water as a product') and by (either intentionally or unintentionally) questioning existing property rights. While centralistic economic steering instruments provide an 'automatic' dynamic incentive, this does not imply that no dynamic incentive can be provided by decentralised arrangements. Arrangements not directly operating according to the market

mechanism (i.e. via economic incentives) can also be designed in such a way as to provide (comparable) incentives. For example, in decentralised arrangements, terms can be included in the contract that may stimulate innovation by either party. Such incentives, however, are not automatic and need to be explicitly included in the contract. The economic evaluation method aims to investigate whether or not there is an economic rationale for an innovative approach to flood protection, based on a different man-nature paradigm (eco-development) and different starting points for economic evaluation. Since the centralised instruments and the *Rivierenland*-concept are explicitly based on (amongst others) environmental principles, these arrangements explicitly aim to stimulate innovation towards more environmentally benign situations. As was mentioned above, for decentralised arrangements, this depends on their design.

As was mentioned before, centralistic policy instruments with a negative incentive are regarded by most target groups as a burden and not as an opportunity for innovation. One of the reasons for this is that the innovations stimulated by the instrument are perceived to be unrelated to the core activity of the economic actor. Therefore, they are regarded by target groups as deteriorating the competitive position of the economic sector. At the start, innovative approaches are niche markets which are accessible to only a small number of actors. A rebate of revenue of the levy to the target group may make this niche market (more quickly) accessible to a larger number of actors. Advocates of these instruments emphasise the business opportunities of innovation towards sustainable enterprise, the positive effects for the image, the prevention of government penalties and interference and the positive effect on competitiveness in the future. The existence of opposing camps in this respect can be explained by the adherence of different policy paradigms regarding the man-nature relationship, which leads to emphasising different ((perceived) positive or negative) aspects of the arrangement.

Political criteria

Concordance

From the perspective of concordance, at present, spatial measures for water management are likely to receive more support than non-spatial ones, because of the dominance of spatial measures and supply management in the normative discourse. Besides, there is a general trend in the present administration towards SIs, like covenants, and spatial planning instruments instead of EIs. Spatial measures based on voluntary agreements better fit this tendency than centralistic arrangements. Supply management strategies are also more in line with traditional approaches to water quantity management according to the discourse 'water as a condition' and according to the SPPP.

The criterion of concordance does not only play a role in the acceptance of arrangements by target groups and other private stakeholders. Concordance with dominant policy discourses may also be decisive for the acceptance of arrangements. This was shown by the analysis of the discourse about the surface water tax. With regard to this tax, concordance with the dominant policy discourse played an unforeseen important role in the choice not to introduce a surface water extraction tax. This tax would not fit the dominant normative discourse in policy to shift from ground water to surface water use for the preparation of drinking water. Besides, it was shown in the empirical chapters that policy approaches or instruments that

are not in line with the normative and/or strategic discourse at EU-level also stand a much smaller chance of being successfully implemented than the ones that are.

Equity

Most centralistic arrangements are more equitable than decentralised arrangements from the polluter or user pays perspective, since they are based on the EPPP. This issue often does not play a dominant role in the decision-making process about decentralised arrangements, since lower levels of governance are usually less concerned with (strictly applying) the EPPP. Instead, they tend to focus more on the social and economic aspects of sustainability. By implementing centralistic arrangements, property rights are changed and not always compensated. In decentralised arrangements, either property rights do not change, or when they do, they are usually compensated. In these arrangements, compensation can be more easily negotiated by various stakeholders because they are more directly involved, the arrangements are (to some extent) on a voluntary basis and stakeholders have more options (rights and resources) for directly raising their voice in the decision-making process. Generally speaking, compensation of a loss of property rights is an important precondition for target group support.

In centralised economic arrangements (both steering instruments and evaluation methods), so many (conflicting) interests are involved, that there will always be some group of actors to oppose to the policy initiative. However, intelligent design of the instrument/method can often (at least in theory) take away some major objections. In these arrangements compensation can take place in the form of a rebate of revenues. For evaluation methods, it is important to include compensation of sufferers in the evaluation. This refers to the feasibility of an arrangement for actual compensation for the evaluated project (alternatives), and not to a discussion about hypothetical compensation, as in often used rules for economic valuation based on neo-classical welfare economics, such as the Kaldor-Hicks rule for hypothetical compensation. The proper arrangement of compensation is a precondition for a policy arrangement from the perspective of policy principles such as the user/polluter pays. If the (S)CBA of a project alternative, including the costs of a compensation scheme (i.e. both the costs of the compensation itself and the administrative costs of the scheme) is negative, the alternative cannot be legitimised to society from the point of view of public finance.

The costs of a number of water management activities are not (completely) borne by the groups of actors causing the need for these activities (cost cause principle). This situation is mainly caused by the fact that the user and polluter pays principles are not strictly applied to every relevant situation. As a consequence, measures need to be taken to mitigate or compensate the effects of excessive use or pollution. These measures are usually paid from the general budget. The result of this is that in fact some target groups of EIs, usually general, less well organised categories of target groups, such as 'tax payers', 'consumers' or 'households', cross-subsidise activities of other more specific and better organised target groups (polluters and resource users).

As was clearly shown by this discussion, the issue of equity and compensation is clearly one of perspective. From the perspective of existing property rights, arrangements applying the extended polluter/user pays principle will not easily comply with target groups ideas about

compensation. Vice versa, arrangements applying the standard polluter/user pays principle will be too easy on target groups with regard to compensation from the perspective of the (extended) polluter/user pays principle.

Transparency

Transparency in general is an important factor for the acceptance of policy arrangements by target groups. This counts for both centralistic and decentralised arrangements. Transparency mainly relates to the intentionality of public actors regarding the instrument: what is the (true) goal of introducing the policy instrument? (see below). Decentralised arrangements are likely to score higher with regard to transparency than centralised arrangements because of two factors: the scale of the arrangement and the voluntariness of co-operation. The latter forces government authorities to be frank about their intentions, since they need to gain the trust and support of private stakeholders in order to get their co-operation.

Purpose/intentionality

Intentionality of an instrument or arrangement is closely related to both the fairness and the transparency criterion. Centralistic instruments are often regarded by target groups as benefiting only public parties. The benefits to the environment or society as a whole are regarded as too indirect and are therefore disputed or completely denied. Besides, centralistic economic steering instruments for environmental policy addressing goods or activities with limited price-elasticity will be questioned with regard to their regulative effect and will be regarded as (a purely) revenue raising instrument. Rebate of revenues to the target groups can take away skepticism about the intentionality of the instrument among target groups and so may explicit legitimisation from the perspective of a greening of the tax system. Vice versa, EIs for environmental policy addressing goods or activities with high price-elasticity may be environmentally effective, but may be judged unsuitable for greening of the tax system, since because of this elasticity, revenue streams will dry out unless rates are increased continuously and substantially. In turn, substantially increasing the rate will be objected to from the perspective of fairness.

With decentralised arrangements, benefits more directly accrue to target groups. Therefore, these are perceived as leading to a more fair distribution of costs and benefits between public and private actors. Besides, in these arrangements, benefits to the environment and benefits of healthy ecosystems to society are more closely related to specific interests of (private) stakeholders, and investments needed to achieve these benefits may as such be accepted more easily. The perception about the fair distribution of costs and benefits for a large part depends on the ability to make benefits of public policy (for example regarding nature management) more explicit and to communicate these benefits. As was shown before, this step still causes major obstacles.

Public and stakeholder support

For all three types of arrangements, clear communication (i.e. both ways) between public and private actors seems to be crucial for public and stakeholder support. From this perspective, public authorities need to communicate clearly about the (true) intentions of (i.e. motives for) the instrument. Moreover, besides focusing on the economic aspect, they need to listen to the interests, thoughts, motives and arguments of primary and secondary

private stakeholders in order to gain mutual understanding. In centralistic policy arrangements, especially those involving steering instruments, this may be more difficult than for decentralised arrangements, since in the former, communication will seldomly take place directly with stakeholders but instead via stakeholder representative organisations. This creates an extra barrier between government and (direct) stakeholder, which may also reduce the likeliness of stakeholder support. As showed from the empirical chapters, constructions to enhance especially stakeholder support run a high risk of being turned down by the EU. This seriously jeopardises the successful implementation (in terms of a number of criteria, such as environmental effectiveness) of a range of arrangements.

Sustainability and integrated water management

Interests related to sustainability diverge, and (thus) so do interpretations of this concept. Politicians and civil servants at the international, national and provincial level dealing with environmental policy and nature and environmental NGOs usually focus on the ecological dimension of sustainability, while (economic) target groups and their political representatives focus more on the social and/or economic dimension. In theory, centralistic arrangements score better on the ecological dimension of sustainability because they are based on the EPPP (providing a dynamic incentive and letting the polluter/user pay for all pollution/use of nature and natural resources). Integration in this respect relates to the internalisation of externalities in the use of natural resources and environmental use space. Decentralised arrangements are likely to score higher on the socio-economic aspects of sustainability (interactive water management). These arrangements are mainly based on the SPPP. One possible explanation for this is that these arrangements are more driven from a pragmatic perspective. This pragmatic approach seems to improve stakeholder support for the instrument, but may be less desirable from a theoretical ideological (environmental) perspective. However, environmental effectiveness also depends on stakeholder support, since stakeholders can reduce environmental effectiveness by obstructing (sabotaging) instruments. As a result, decentralised arrangements may sometimes even score higher on the ecological dimension.

Whether or not decentralised arrangements contribute to the ecological dimension of sustainable water management depends on the paradigmatic nature of the policy principles used, the existing distribution of property rights and the opportunities to change this distribution. In this respect, blue service arrangements seem to mainly serve the social and economic dimensions of sustainability, by respecting the existing distribution of property rights, by properly compensating those that suffer from the arrangement (and thus even providing them with a new source of income) and by limiting public expenditure on spatial water management measures. PPP-arrangements for spatial water management do offer the opportunity to redistribute property rights and as such are more likely to also contribute to the ecological dimension of sustainability. Spatial arrangements do often lead to external integration between water management and spatial planning by serving various (land use related) interests at the same time by means of multiple land use. Centralistic instruments may also serve various interests, but these are often perceived by private actors to be related only to public interests or to be indirect and (thus) to have low priority in actual decisions.

Opinions about the effects of centralistic instruments on the economic dimension of sustainability diverge. Opponents of such instruments will argue that these instruments will have negative effects on the competitiveness of the economic sector or of the Dutch economy as a whole in the international market. Advocates will argue that this is only true for vested, modernist economic production and consumption systems and argued from a narrow economic perspective, looking only at direct costs and benefits. From the perspective of schools of thought that aim to take a broader perspective by internalising negative environmental effects in economic analysis and from the perspective of innovative strength and long-term economic sustainability, centralistic instruments for environmental policy are likely to be judged both necessary and beneficial.

With regard to the integration of policy domains, there is a difference in emphasis between the national and the international level. Whereas at present, the emphasis at the national level is on the integration of water management and spatial planning, in international and EU policy the emphasis is (still) on the integration of water management and environmental policy. These differences in emphasis result in different institutional frameworks for water systems quantity management on the one hand, and water systems quality management on the other. The influence of international policy (especially at the EU-level) on the latter is much stronger than on the former.

Target group support

Target group support is sometimes hard to predict and often depends on a range of factors, such as the specific technical design of the policy instrument, on types of target groups and their paradigms and discourses and the way they are organised and can dispose of resources, and on the specific (local) situation. As was indicated above, the fact that decentralised arrangements are based on voluntariness of target groups and on mutual dependence is likely to substantially improve target group support. Centralistic arrangements are often regarded as top-down and therefore target group support is less likely to exist. In this situation, target groups do not have the feeling they can influence the arrangement (in other words: they have the feeling there is no level playing field), which is likely to result in a lack of trust towards and support for the (primary) public actors. Other factors enhancing the likeliness of stakeholder support for decentralised instruments are the more specific nature of the instrument, which enables meeting target group's interests more closely, and the absence of negative dynamic incentives.

Risk and uncertainty

All three types of arrangements have to deal with risks. Centralistic instruments suffer from an environmental effectiveness risk. Decentralised instruments suffer from moral hazard (the risk that one of the parties abuses the contract or abandons co-operation). The Rivierenland-project has to address financial and economic risks with regard to sunk costs because of pervasive uncertainty about the true magnitude of exogenous variables, such as climate change and societal developments. The suggestion made in the report about economic evaluation (see Boot (2001)) was to design spatial measures ('room for the river') in such a way as to avoid high sunk costs and leave options open to (partly) halt, adapt or reverse the process. Besides, it advised the design of a robust system that is only to a limited extent dependent on sophisticated operation systems.

In the report mentioned above, it was taken as a starting point that integrated water management is about a proper balancing of all interests involved in water management. Besides, it was acknowledged that over time, these interests may change. Therefore, the concept of integrated water management can be said to entail a specific attitude towards risk and uncertainty, namely one that is based on interactiveness and adaptiveness. The arrangements discussed here score differently with regard to these criteria. The main difference between centralised arrangements (including the national 'room for the river'-approach) and decentralised arrangements is that in the latter, risks can be addressed in transparent communication between stakeholders. In centralised arrangements, the design of policy instruments usually takes place in remote arenas, with little involvement of direct stakeholders. Centralised arrangements including economic steering instruments have to deal with an additional complicating factor. Whereas in spatial arrangements, more possibilities exist for a gradual introduction of a new approach, the introduction of a new centralistic steering instrument is a one-moment occasion. Therefore, the design of the instrument has to be well thought through before introduction. However, it is hard to foresee and estimate risks on forehand and thus take away these risks in the design of the instrument. From the perspective of interactiveness and adaptiveness, decentralised arrangements thus score higher than centralistic ones. The score of both centralistic arrangements with regard to these criteria cannot be compared easily. However, considering the impact of the *Rivierenland*-concept, combined with the need for public support, it seems that the decision-making process for this arrangement will be arranged in such a way as to allow for interactive decision-making. Whether the concept will also become adaptive depends on the way it is designed.

Institutional uncertainty

The uncertainty about the exact consequences of EU-regulations for national and local arrangements creates substantial risks for stakeholders of these arrangements. This is the case for all types of arrangements discussed in this thesis. However, since centralistic arrangements are already more institutionalised than decentralised ones, uncertainty in general is larger with regard to the latter type. Uncertainty with regard to centralistic arrangements mainly relates to concordance with the dominant normative discourse at EU-level and rebate of revenues. The main cause of uncertainty with regard to decentral arrangements is whether or not these are regarded as state support to domestic economic sectors. In order to get more clarity about the compatibility of decentralised arrangements with EU-regulations, pilot projects would have to be undertaken and research would have to be done. These initiatives would have to be financially supported by the national or EU-government in order to remove (financial) risks for both public and private partners engaging in such arrangements.

Scientific uncertainty

The fact that (valuation of) damage to and benefits of (healthy) ecosystems are still accompanied by large uncertainties and are therefore heavily debated and not standardised yet, makes it difficult to scientifically legitimise (through economic valuation methods such as contingent valuation, hedonic pricing and travel-cost methods) additional environmental policy measures and measures according to the extended polluter pays principle. The uncertainty and lack of consensus about the range and magnitude of economic effects prevents or substantially hinders the use of economic evaluation methods for integrated and sustainable project evaluation (see the analysis of the *Rivierenland*-study).

CONCLUSION

Differences and similarities

Differences between various policy instruments and evaluation methods with regard to their application cannot be completely explained by making the distinction between 'economic steering instruments' and 'economic evaluation methods'. All arrangements have their specific obstacles. Overall, it seems that policy approaches based on neo-classical economics encounter more obstacles than the ones that are based on schools of economic thought with 'less ambitious' assumptions about the market, such as new institutional economics and ecological economics. The assumptions of neo-classical economics are perceived as less realistic and are therefore more heavily debated than the assumptions of other schools of economic thought when discussing their usefulness for (integrated) water management. Another reason for this difference is that management approaches based on new institutional economics (i.e. decentralised arrangements) are less ambitious with regard to applying the Polluter/User Pays Principle. Besides, decentral arrangements offer more (economic) opportunities to private actors. Private actors have a basic negative attitude towards centralistic arrangements. Because of this attitude, they will always search for, and usually find, any reason to object to such arrangements.

The arrangements discussed in this subsection show various similarities. The characteristics of decentralised arrangements overlap with the *Rivierenland*-study because they involve spatial water retention and storage measures. The centralistic steering arrangements and the *Rivierenland*-study are similar in the sense that the central government is the main public actor, and in the fact that this actor can dispose of top-down instruments to impose its will on other actors. The similarity between centralistic steering arrangements and PPP-arrangements is that they (may) take the Extended User/Polluter Pays Principle as a starting point for (re-)defining property rights. The least similarities can be found between centralistic steering arrangements and decentralised management arrangements based on blue services. The major similarity between all arrangements is that they aim to bring about a change in water management towards integrated or sustainable approaches, although in different ways and emphasising different aspects of integration and sustainability. Centralistic arrangements involving economic steering instruments primarily focus on the regulative effect and (thus) on the ecological dimension of sustainability. The *Rivierenland*-concept combines safety with ecological concerns and socio-economic impacts for society as a whole. Finally, decentralised arrangements mainly focus on cost-effectiveness of water management, combined with the socio-economic dimension of sustainability from the perspective of specific, direct stakeholders (the landowners). The degree to which these arrangements include the ecological dimension strongly depends on their purpose and design.

Factors for success and failure

The decentralised arrangements, and possibly also the 'room for river'-approach (depending on design of the planning process) are strongly directed at consensus building between primary actors. This is often less the case for centralised instruments. Processes of consensus building are likely to create mutual understanding and thus stakeholder support, which may be one of the main reasons for the (potential) success of these arrangements.

Besides, the spatial arrangements often aim at combining various land use functions and thus at meeting various interests at the same time (integrated or multiple land use planning). This may lead to a broader stakeholder support than for centralistic instruments, which are (perceived as) more top-down and usually serve only a limited number of stakeholders. At the central (national) level, the emphasis at present is (therefore) on suasive instruments, which seem to offer more opportunities for consensus building than EIs.

Dominant factors

It is hard to draw conclusions on which factors are dominant in the acceptance or rejection of specific (types of) policy instruments. These factors vary per issue, situation and arrangement. In most cases, a combination of factors plays a role in decision-making about the way to deal with a policy issue. Besides, factors are often closely interrelated, which makes it difficult to distinguish them, let alone indicate which are dominant, or which is cause and which is effect.

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

In this chapter, conclusions will be drawn from the empirical analysis in the chapters 4 to 6 and the meta-analysis in chapter 7. Section 8.2 presents conclusions based on chapter 4. These conclusions relate to the presence of economic policy elements in policy at various levels of governance, from the EU-level to the level of water boards and municipalities. In section 8.3, conclusions are drawn about the way in which issues in Dutch water management are addressed and the role economic instruments and methods play in this. Based on sections 8.2 and 8.3, conclusions are drawn in section 8.4 regarding the comparison of the theoretical applicability and practical use of economic policy approaches in Dutch water management. Sections 8.2, 8.3 and 8.4 serve as input to answering sub-questions b) ('What are the starting points of integrated water management, how is the concept made operational in Dutch water management and how are economic policy instruments and evaluation methods embedded in this policy domain?') and c) ('What contribution can economic steering instruments and evaluation methods make in theory to the implementation of the concept of 'integrated water management' and what contribution do they make in the practice of Dutch water management?') as formulated in chapter 1.

In section 8.5, conclusions will be drawn about factors that determine the design of categories of instruments, on the basis of the comparison of these categories. In section 8.6, conclusions will be drawn regarding specific discourses, for which hypothetical themes and patterns were formulated in chapter 3. Sections 8.5 and 8.6 together serve as input for answering sub-question d) as formulated in chapter 1 ('How can the role economic steering instruments and evaluation methods play in Dutch water management be explained?').

Based on the former sections, in section 8.7 conclusions will be drawn with regard to the research-sub questions as formulated in chapter 1, the combined answer to which represents the answer to the central research question of this thesis. Subsection 8.7.1 addresses sub-questions b) and d). Subsection 8.7.2 addresses sub question c). This sub-question is addressed separately because it is (partly) based on the insights generated in answering sub questions b) and d).

Section 8.8 discusses the applicability of the analytical framework to the object of research and in a more general sense to policy analysis in general and the analysis of various issues and arrangements in Dutch water management in particular. The chapter ends with recommendations for policymaking and further research (section 8.8).

8.2 ECONOMIC ELEMENTS IN WATER POLICY

8.2.1 EU LEVEL

The central position of the Polluter Pays Principle (PPP) in the Water Framework Directive (WFD) is a strong incentive to use centralistic (neo-classical) economic instruments for environmental policy more widely in water management in EU Member States. A close link exists between the two central financing principles in the WFD, the 'full cost recovery' and the 'polluter (or user) pays principle', through the internalisation of externalities, which was made an explicit part of the first principle, by adding the words 'including environmental and resource costs' (see Preamble 38 and Article 9 of the WFD).

According to 'COM (97) 9 final' of the European Commission, regarding environmental taxes and charges in the single (EU) market, the use of environmental taxes and charges is rapidly increasing in the Member States. This communication also indicates that there is considerable scope for action by Member States to implement these instruments. These environmental taxes and charges are considered especially attractive in improving the efficiency of environmental policy (and thus especially for water quality management and protection of water as a natural resource).

8.2.2 COMPARISON OF ECONOMIC POLICY ELEMENTS AT THE EU AND EU MEMBER STATES LEVEL

Policy principles and goals at EU and Dutch national level show a high degree of congruence.

Economic policy principles presented at EU level, such as the (extended) polluter pays principle, the user pays principle, the principle of full cost recovery (including environmental and resource cost) and the principle of rectifying environmental damage at source, in theory fit an approach to water management according to the paradigms of 'environmental protection' and/or 'resource management', since full implementation of the principles would warrant internalisation of environmental effects in decision-making. The principles in general facilitate the application of economic steering instruments, which, if applied in a pure way, operate according to the EPPP. However, these principles do not guarantee a shift towards the paradigm of 'eco-development', since they are (mainly) based on the neo-classical school of economics. Principles formulated at the national level in general are in line with the ones formulated at the global and EU-level and focus on sustainability. Most of the principles introduced at the international, EU and national level were mentioned as principles for integrated water management by academic scholars. However, whether or not they contribute to integrated water management for most part depends on the way they are made operational and on the priority order of principles in specific issues.

Because of the omnipresent exemptions for certain economic sectors from environmental taxes in many EU Member States, these instruments are often not (fully) in line with the principles of integrated water management as mentioned above. Compared to other EU Member States/EEA Countries, environmental taxes and charges in The Netherlands know relatively few exemptions (see chapter 6). Compared to other countries, The Netherlands

show a large number of charges directly related to water, such as a sewage charge, water effluent charge, groundwater extraction tax and manure charge. However, no surface water extraction charge is in place, whereas a number of other countries did install such a charge (the Scandinavian countries, with the exception of Iceland, France, Germany, Liechtenstein and the UK). The reason for this was discussed in chapter 5. The sewage charge and water effluent charge were introduced in the 1970s as instruments to implement the *Wvo*. These instruments have served as examples of regulative environmental levies for other countries.

Compared to other EU Member States/EEA countries, The Netherlands know few product levies in the policy programme to combat diffuse pollution. In theory, the number of levies for addressing this type of pollution could still be substantially expanded. However, it showed that the limited number of levies for addressing diffuse pollution in The Netherlands does not indicate inferior environmental policy. Rather, it is the result of an explicit policy to address harmful substances early in the production chain in order to reduce administrative costs and efforts.

At EU and Dutch national level, there is a plea in policy for a broader application of economic instruments, but this mainly regards economic evaluation of projects and policy alternatives and economic analysis of societal and economic activities as input for policymaking. Economic steering instruments take a modest position in the strategic discourse about water policy, both at the EU and Dutch national level. However, at these levels, initiatives to implement these instruments do exist in the domain of environmental policy with regard to diffuse pollution.

8.2.3 COMPARISON OF ECONOMIC ELEMENTS OF WATER POLICY AT ALL LEVELS OF GOVERNANCE IN THE NETHERLANDS

POLICY PRINCIPLES AND GOALS

Although ideology-based policy elements at different levels of governance show considerable degree of similarity, the motives for these choices are often different, resulting in diverging story lines in the normative and strategic discourses regarding the operationalisation of these more general policy elements. This room for creative interpretation of policy principles, goals and concepts is created by the generalistic way in which these elements are formulated, without making them operational in the form of (suggestions for) concrete elements of policymaking, such as programmes, instruments and measures. Leaving operationalisation of policy principles, goals and visions to the discretion of lower policy levels and private parties is supported by the general trends in governance towards deregulation and privatisation. Generally speaking, this development flaws the ambitions with regard to ecological quality and sustainability.

The general, unspecific way of formulating the policy principles, goals and concepts leaves it unclear which types of policy instruments are intended for implementation of these measures. The hypothesis about the cause of this phenomenon as formulated in chapter 2 (see also De Savornin Lohman, 1994) is that politicians prefer to leave the detailed specification of policy instruments to the administrative arena, since this arena is more

closed and because of the limited number of actors involved in general it is easier to get these actors on one line. Important terms in the story line supporting these tactics are 'administrative discretion' and 'subsidiarity'. This hypothesis seems to be supported by a shift in the strategic discourse from centralistic steering instruments towards decentralised arrangements and suasive instruments at the national level. Decision-making about these instruments and arrangements takes place more in the administrative arena.

In the white papers at the EU and Dutch national level, there is considerable intention for horizontal integration of policy motivated from the perspective of the ecological dimension of sustainability. However, ecological policy principles formulated at these levels are often flawed at lower levels of water policy and management, both via a different interpretation of the same policy principles and via the application of other, less sustainable (and thus (potentially) conflicting) policy principles and pragmatic considerations. Generally speaking, the lower the level of governance, the more anthropocentric the policy goals are. In terms of paradigms, it can be said that at higher levels, because of its abstract and 'remote' nature, policy can be formulated according to strong sustainability paradigms, formulated by 'environmentally oriented' institutions, without feeling the burden of conflicting interests and direct consequences. These high ambitions based on strong sustainability paradigms are not maintained at lower levels of policymaking and implementation. This process is closely related to the criterion of concordance, which states (among other things) that policies should not represent a too radical departure from prevailing and likely future practices and underlying philosophies and that instruments should be acceptable to vested economic and political interests. As a consequence, in a democracy, policy changes are inherently slow and incremental. Only 'shock events' can rapidly change policy practices. This was discussed in chapter 5 with regard to the near floods in the 1990s and droughts in the early 2000s.

Another reason suggested in this thesis with regard to the discrepancy between policy at the EU and national level and lower domestic levels of governance is that the interaction between the public authority and its grass roots (and thus the influence by grass roots on the decision-making process) is more direct at the regional and local level, resulting in compromises with regard to sustainability from the ecological point of view. This compromise may result from a fear among politicians of losing the support from their constituency, and thus votes. As a consequence, in the formulation and legitimisation of policy at lower levels of governance more emphasis is placed on the economic and social dimensions of sustainability. This hypothesis was confirmed by empirical data.

Policy at the European level is growing in importance for water policy and management in its member states, but lower governmental levels and private actors also influence national policymaking. This influence is often mutual, and the direction of influence is determined by the (power-) relationship between the actors involved. An example of the influence of private actors on national policymaking is the obstruction of economic instruments and command and control instruments by various representative organisations of industry and agriculture, resulting in a different approach via suasive instruments, especially covenants.

POLICY INSTRUMENTS

Based on the description of water quantity and quality policy and management in the empirical chapters, it can be concluded that economic policy instruments (with an incentive function) are being used to a limited extent in Dutch water policy and management. The degree of application of economic policy instruments as expected, based on the theoretical compatibility between economic theory and integrated water management, is not found in reality.

At the level of water boards and municipalities, suggested or implemented levies (taxes or charges) are usually of the financing type (with the primary goal of financing general public expenditure or water management tasks, respectively). However, the wide adoption of the PPP in recent years at all levels of water management has stimulated the application of some regulatory environmental levies (the primary goal being the influencing of target group behaviour). Most of these initiatives were taken by the Ministry of Environment and mainly addressed diffuse sources of pollution. These instruments are usually not directed specifically at water pollution, but water systems may benefit from these arrangements. For this purpose, some institutional changes have been made in the past few years that stimulate the application of economic steering instruments in Dutch water management. An example of such an institutional change is the Environmental taxes act (*Wet belastingen op milieugrondslag*), which enables a (partial) greening of the tax system. The EU and national levels of EU Member States are the dominant levels at which regulatory economic environmental instruments are proposed and applied.

New economic approaches in both water quality and quantity management, such as public-private partnerships, blue services and making the benefits of water more explicit, are since recently being studied more intensively. These innovative approaches are considered to have a high potential in the tuning of water management and spatial planning in both rural and urban areas. However, so far, they have only been applied on a very limited scale. The main reasons are uncertainty caused by a lack of institutionalisation of the arrangements and the related risks, and paradigmatic, institutional and methodological obstacles. An important institutional obstacle is EU regulations on competition and government support for a level playing field in the EU internal market.

Market regulation of water management tasks through privatisation and liberalisation is mainly paid attention to at the European and national level and is mainly directed at the drinking water chain. However, according to the Commissie Tielrooy (2000), especially at the local and regional level, with regard to the 'room for water'-policy, opportunities exist to make the market pay for the benefits this new water management yields. This policy addresses water systems management. The reason that the focus with regard to privatisation seems to be on water chain management is that arrangements for water systems management (such as PPP- and blue service-arrangements) are often not referred to as privatisation of water management. In this respect, a distinction can be made between privatisation of formerly public water management organisations (privatisation of organisations) and privatisation of water management services themselves (privatisation of services and products).

Many initiatives with regard to taxes and charges presently take place at EU level. Environmental economic instruments applied or proposed in Member States have been compared in various studies²¹⁰. These studies served two main purposes: the first is assessing if these instruments cause competitive disturbances in the EU internal market. The attention for competitive disturbances in the EU internal market shows the importance of the debate about economic consequences for target groups of environmental economic instruments. This debate relates to the fairness-criterion. It also indicates the important role of economic criteria in the normative discourse about policy instruments. The second is to consider possibilities for applying environmental economic instruments at EU level. Implementation of environmental economic instruments at EU level would change the institutional setting of various policy arrangements, the performance of instruments with regard to a number of important criteria and probably also the policy coalitions involved. This would largely take away arguments of member states that these instruments result in competitive disadvantages. Besides, they may form an important basis for financing environmental activities at EU level and for greening the EU financing system.

8.2.4 ECONOMIC APPROACHES AT WATER BOARD-LEVEL

The main principles for the financing of water board management tasks, namely the traditional '*belang, betalen, zeggenschap*' (stake, payment, influence) and the newer 'polluter pays principle' (PPP) are potentially conflicting principles, depending on the interpretation of both. 'Stake, payment, influence' can be interpreted both in a narrow and in a broad sense. When interpreted in a narrow sense, public water management will serve only a small number of specific interests. In recent years, the relative influence of citizens and non-agricultural business in decision-making structures in water boards has increased substantially as a result of a shift in the relative contribution of various groups of actors to the financing of management tasks by water boards. As was discussed several times, the polluter and user pays principles have two main pendants: the extended and the standard version. At present, the dominant interpretation is the standard PPP. If interpreted according to the extended version, this principle will lead to a shift in relative contributions of various economic sectors. If in this situation the principle of 'stake, payment, influence' is maintained as the dominant financing principle, polluters and users will get more influence on decision-making, via representation in the board. This would not be in line with sustainability from an ecological point of view.

The traditional financing principle also potentially conflicts with other central principles at the EU and Dutch national level, such as the principle of 'full cost recovery (including environmental costs)' and the principle of 'rectifying environmental damage at source', since in the present financing structure of Dutch water management, the costs of damage by economic activities on nature and the benefits of healthy aquatic ecosystems for society are not completely included in this financing structure yet, let alone that these costs are retrieved from the polluter or the actor benefiting from special water management measures and the related availability of natural resources. With an increasing number of (conflicting) interests, the triptych 'interest, payment, influence' cannot be maintained.

²¹⁰ See for example ECOTEC et al. (1999) and the studies quoted in this report.

From the point of view of integrated water management, the (E)PPP and (E)UPP should in principle be the dominant financing principles. Besides, the height of the relative contribution to the financing of water board tasks should not be (directly) linked to the decision-making power of specific economic actors. Therefore, the pre-condition set by the union of water boards for the evaluation of the financing structure by the 'Commissie Togetema' (i.e. maintaining the traditional financing principle as a pre-condition) is in conflict with EU and Dutch national policy principles for integrated water management. The priority order of financing principles could be (1) 'the polluter pays', (2) 'the user pays', (3) 'the specific benefitter pays' and (4) 'the general benefitter pays'. In this priority order, the user pays principle only counts for direct use of water. Examples of specific benefitters are agriculture, owners of real estate or other actors with an economic interest. Examples of general benefitters are nature, citizens or general taxpayers.

8.3 ISSUES IN DUTCH WATER MANAGEMENT

8.3.1 WATER SYSTEMS QUANTITY MANAGEMENT

In the studies of temporary and permanent commissions on water related issues (such as the *Commissie Waterbeheer 21^{ste} eeuw* and the *Commissie Integraal Waterbeheer*), a lot of attention is paid to spatial (water quantity related) issues. This attention for water quantity related issues is driven by a series of shock events, such as the near floods from the Meuse of 1993 and 1995, floods from local precipitation in the lower western part of the country and to a lesser extent by the effects of droughts due to periods of low precipitation. The issue priority on the societal and political agenda can be largely explained by a number of factors: the perception of the gravity of the problem by various actors, the degree to which the interests of various actors are at stake due to the issue and the resources these actors can deploy to put the issue on the societal and/or political agenda. In terms of elements of policy arrangements, this indicates the importance of story lines used by specific discourse coalitions, the relative power these coalitions have and the resources they use to generate this power. With regard to water issues, the combination of these factors led to the present prioritising of water quantity related issues over water quality related issues. With regard to the first factor, the perception of the gravity of water quantity issues, especially the threat of floods was stimulated by shock events. The main aspects (story lines) in water quantity related issues involving strong interests are:

- the liability of the government for damage due to floods;
- damage to agriculture and real estate from floods and droughts and to other capital from floods;
- the risk of casualties.

With regard to the first interest, responsible public authorities can use their policymaking and legal power to take their own measures to prevent floods (public projects, such as dyke reinforcements). However, these measures are becoming increasingly expensive. Therefore, the central government aims at introducing a different strategy to flood protection, which redefines property rights and therefore liability for flood damage. This strategy is introduced via the 'room for river' story line, which includes a number of concepts, such as 'spatial approaches to flood protection', 'awareness raising with regard to the omni-presence of

water', 'breaking down the strict separation of water and land' and 'combining safety with spatial quality'. Especially the latter concept can lead to coalitions between the central government with regard to flood protection and other actors aiming at spatial quality (nature organisations, cultural-historic clubs, provinces, and others), or at least a higher chance of acceptance of the new strategy. Besides, it can be used as an argument to initiate a restructuring of agriculture via a diversification of products and services.

Integration of water aspects into other aspects of policymaking for the physical environment, spatial planning and nature conservation, is mainly addressed through planning instruments and command and control instruments. In recent years, initiatives have emerged for management and development of water systems involving arrangements based on new institutional economic principles. However, these arrangements need a proper institutional framework as well. Therefore, rules and regulations, including planning and CAC-instruments, act as a basis for these instruments.

The provision of water management tasks by private actors so far plays a marginal but increasing role in Dutch water management. Especially with regard to spatial approaches to water management, this could become an important mechanism to achieve water management goals in the near future. The potential for market-based approaches to spatial water management was already identified by the *Commissie Financieringsstructuur Waterbeheer (Commissie Togtema)* (see Unie van Waterschappen, 1999). Centralistic steering instruments are less suitable policy instruments for spatial approaches to water management, since often there is no competitive market (landowners have a natural monopoly). Therefore, the choice is that between public water management projects, CAC-instruments and decentralised arrangements. An important advantage of decentralised arrangements over public projects is that no land needs to be purchased to reach the water management goal. An important advantage of decentralised arrangements over CAC-instruments is that the chance of co-operation by stakeholders is larger. Whether this approach is more (cost-) effective than CAC-approaches remains yet to be evaluated.

In studying spatial approaches to water issues, there is considerable attention for the economic aspects of damage that can be done by water and the costs for mitigating and compensating this damage. The benefits of water for all kinds of societal activities, however, remain largely implicit. Making this 'benefit-side' of water systems more explicit could make the balance topple towards pro-active, 'water benign' solutions more often. Besides, public authorities (and private actors) may be able to use this approach for a structural financing of water (quantity) management activities. This would require substantial research efforts directed at development of methods making the benefits of (aquatic) ecosystems explicit and political attention for institutionalisation (a.o. standardisation) of these methods. The 'exploitation' of the benefits of water already takes place more often, although implicitly (without calculation, let alone valuation), in PPP-arrangements. In these arrangements, the private entrepreneurs estimate whether the benefits of the water system for their business can offset the costs of the water measures to be paid by this private actor. Applying the benefit principle in a strict (-er) manner would lead to a redistribution of the costs of water management among economic sectors and thus to an actual redistribution of property rights.

8.3.2 WATER SYSTEMS QUALITY MANAGEMENT

DIFFUSE POLLUTION

As was mentioned earlier, with regard to diffuse pollution, there is in theory still considerable room to expand the total package of economic environmental steering instruments. Some of the options for this were studied in preparation of *NW4*. The conclusion in *NW4* was that the possibilities for 'that type of instruments' were limited. With regard to a 'pollution-levy' for diffuse pollution, based on the *WVO*, the juridical framework was deemed unsuitable (institutional obstacle). With regard to regulating levies, the regulating effect was deemed limited or unattainable (due to limited price-elasticity) (technical functioning, related to the fairness criterion). Only with regard to percolation from agrarian soils, a 'pollution-levy' was regarded possible, albeit as a 'lump-sum' regulation. However, specificity is regarded in policy theory as an important criterion for policy instruments, and a lump sum regulation does not meet this criterion. On the other hand, the more specific a policy instrument becomes, the higher the administrative costs usually are. This is a common and constant dilemma in the design of policy arrangements involving centralistic economic steering instruments (see also later).

Earlier in this chapter, it was concluded that the range of potential environmental levies for Dutch water management has not been depleted yet. However, in Dutch water and environmental policy, at present there is a preference for suasive policy instruments at the national level. The main reason for this preference is that economic steering instruments often lead to disagreement between government and target groups, target group obstruction and (as a consequence) reduced effectiveness and efficiency of the instrument. It is expected that measures agreed between the government and target groups on the basis of voluntary commitment will be more environmentally effective and perhaps even more cost-effective as well.

In chapters 5 and 6, a number of market-based instruments in Dutch water systems quality management were addressed. One of the conclusions following from those chapters is that many of these instruments could best be decided upon and formalised at EU level. This would prevent (arguments of) competitive distortion of these instruments and possible 'leakages' at the borders, at least with regard to EU internal market competition. So far, hardly any, or even no regulative environmental EIs at all have been implemented at EU-level yet. As was shown in chapter 6, however, such arrangements have to cope with substantial institutional and organisational obstacles. Even at EU level, such obstacles are created. For example, the fact that according to the WFD market based instruments fall in the category of supplementary measures, to be decided and implemented by individual EU Member States conflicts with this conclusion. Such a delegation of tasks to the Member State level, or even lower, is in line with the general trend towards deregulation and with the principle of subsidiarity.

8.4 CONFRONTING THEORETICAL APPLICABILITY AND PRACTICAL IMPLEMENTATION OF ECONOMIC POLICY APPROACHES

With regard to most issues in Dutch water management, water or other water-related goods and services are relatively scarce. Therefore, most issues in Dutch water management can in principle be studied from an economic point of view. The core aspect of integrated water management is the balanced weighing of all interests and effects involved in water management. Compared to the previous, sectoral phase in water management, this means especially a better representation of the interests of nature, the environment and citizens/consumers. Therefore, it is important that in economic policy approaches, all interests and effects are included as well. In this respect, the internalisation of negative externalities (via a strict application of the *Polluter Pays Principle* and the *Full Cost Recovery Principle*) is a crucial step when addressing activities with a negative influence on water systems. Besides, the positive value ('benefits') of water systems for society would have to be made more explicit in (economic) decision-making processes about water management. The first mechanism can be addressed via neo-classical economic environmental policy instruments. The second so far has a marginal position in economic decision-making about water management. This concept could be elaborated in policy domains such as recreation (for example by making visitors pay for the entry of (wet) nature reserves), urban water quantity management (for example by making the added value of water for the living environment explicit and using it for financing water management measures) and rural water quantity related measures (by providing rural landowners with opportunities to offer water related products and services). Making the value of water more explicit is likely to lead to a redefinition of property rights regarding the use of natural resources and environmental use space. In PPP-arrangements for area development, the value of water is implicitly used for setting the terms of the contract, by including the provision of public (water) facilities in the cost-benefit analysis of private actors for establishing the financial feasibility of the project and by (thus) redefining property rights.

The notion that economic policy instruments are not applied in Dutch water management to the degree expected on the basis of (neo-classical) theory was confirmed by empirical data, for reasons described in the empirical chapters. However, new initiatives are being taken, both for instruments based on neo-classical theory (mainly for addressing diffuse pollution) and instruments based on new institutional theory (mainly in water quantity management). Besides, the costs and benefits of effects on the environment of public and private initiatives are increasingly included in economic evaluations, albeit slowly, due to methodological obstacles.

8.5 CONCLUSIONS BASED ON (COMPARISON OF) CATEGORIES OF INSTRUMENTS

In this section, generalised conclusions are presented based on the comparison of categories of instruments in chapter 7.

8.5.1 CENTRALISTIC AND DECENTRALISED ARRANGEMENTS COMPARED

Decentralised arrangements have the potential of addressing multiple issues and serving several public and private goals in one arrangement. As such, they have the potential of gaining support from a broad range of stakeholders with diverging interests. Besides, addressing multiple issues at the same time is a dominant normative discourse in spatial policy ('multiple land use planning', 'comprehensive/integrated planning', etcetera). Centralistic arrangements may also serve multiple policy goals at the same time, but the general public and specific groups of stakeholders may not always accept these policy goals (such as revenue raising and ambient environmental quality) as legitimate, because benefits of these arrangements are too general in nature. The goals and interests served in decentralised arrangements are often more specific (personal) and more visible to private stakeholders.

The centralised economic steering instruments, because of the precondition of not being discriminative in principle, have such a broad reach that there are likely to be doubts with regard to a number of criteria, such as their efficiency (since there are likely to be some activities subject to the instrument that score low on this criterion, for example because of low price elasticity), fairness and intentionality. Besides, the chance of unintended side effects is expected to be larger than with decentralised instruments.

Centralistic economic instruments face the dilemma of compromising between a large number of criteria, such as specificity, equity, fairness and efficiency. Taking the example of specificity versus efficiency: in principle, centralistic instruments are fair and equitable from the perspective of the PPP and/or UPP. Strict application of these principles, however, would lead to high administrative costs and bureaucracy. Thus, the more specific (discriminative) an instrument operates, the more sophisticated its design, and the higher administrative and perception costs will be. As a consequence, the instrument compromises on efficiency. Vice versa, the disadvantage of broad sweep, efficient designs is the likeliness of protests by target groups that argue they should not be subject to the instrument, argued from the perspective of the polluter or user pays principle or from other equity or fairness criteria.

Decentralised arrangements have a number of important theoretical advantages over centralistic arrangements. Decentralised economic steering instruments often have an advantage over centralised ones in terms of transparency, stakeholder support and specificity. Because the arrangements are relatively new, no definite conclusions can be drawn yet about their cost- and environmental effectiveness as compared to centralised instruments. Because these arrangements have not yet been applied much, they are not yet institutionalised. As a consequence, actors engaging in these arrangements face substantial uncertainty. This may be an obstacle in their wide application.

Some issues in water management cannot be solved by regional and local arrangements involving economic instruments. This seems to be more true for water quality issues than for water quantity issues, since water quality related issues often surmount the regional scale in effects and required policy approach. This is especially true for diffuse pollution, which is the most important remaining challenge in water quality management. Most water quantity

related issues that may be addressed with arrangements involving economic elements operate at the regional or local level²¹¹. Therefore, centralistic and decentral arrangements involving economic instruments are often complementary rather than competitive, since they often address different policy issues, playing at different levels of governance. Considering the advantages of decentral arrangements over centralistic arrangements as discussed in this thesis, one may consider the following rule of thumb for the balance between decentral and centralistic arrangements: decentral where possible, central where necessary. As was argued before, centralistic arrangements will especially be necessary for addressing diffuse pollution. Which (mix of) instruments are best used at this level to address this issue was not a matter of concern in this thesis.

8.5.2 ARRANGEMENTS FOR WATER QUALITY AND QUANTITY MANAGEMENT COMPARED

According to theory, centralistic steering instruments will only work properly if the product/substance addressed and its applications are homogeneous in nature. This is a precondition for a clear definition of property rights of a commodity. If property rights are not clearly defined, target groups will argue that they should be exempted from the instrument, or that they should be eligible for a special arrangement. Such exemptions or special provisions are bound to compromise the (environmental) effectiveness of the instrument. If no exemptions are made, the instrument is likely to be criticised for a lack of specificity and cost-effectiveness (achieving the reduction in environmental burden against the least costs) (see also above). An arrangement without exemptions, which at the same time is specific, is only likely to emerge in case of a homogeneous good. Based on this line of reasoning, it may be expected that centralistic steering instruments for water quantity management (demand management) are easier to implement than centralistic steering instruments for water quality management, since in the latter case, substances addressed are in general more heterogeneous. However, as was shown in this thesis, the dominant normative discourse aims at the opposite: decentralised arrangements for water systems quantity management and centralistic arrangements for water quality arrangements. Besides, free water (especially surface water) poses a problem with regard to the criterion of excludability.

Due to factors mentioned earlier in this thesis, water quantity issues at present are easier to put on the societal and political agenda than are water quality issues. With regard to the perception of the problem, because of the direct risks involved, near floods are more easily regarded as a problem than are the gradually aggravating effects of diffuse pollution or the gradual disappearance of healthy aquatic ecosystems, the so called 'creeping environmental problems'. However, the costs to society of these creeping processes may well exceed those of a water quantity related calamity. The problem in this respect is the calculation of these costs. Generally speaking, these issues are so complex (involving so many indirect costs and benefits) that present calculation methods do not suffice. The same line of reasoning can be applied to two different types of water quantity issues, namely shock events such as floods on the one hand, and creeping processes such as desiccation, salinisation and subsidence on

²¹¹ The exception is the management of the primary water system, which is a national or even international matter. However, as we have seen, the management of this system usually does not involve economic steering instruments.

the other. According to calamity-theories (see also the discussion of 'shock events' in Wiering and Immink, 2003) and the 'issue attention cycle' (Downs, 1972) a major water quality related accident (such as the Sandoz disaster in Basel in 1986) may shift the balance of attention towards water quality related issues. A more strategic approach, paying attention to the long-term effects of economic activities and policy measures, may reduce fluctuation of policy attention due to societal and political agenda setting.

8.6. CONCLUSIONS REGARDING SPECIFIC DISCOURSES

In subsection 3.7.2, the analysis of a number of specific discourses related to the application of economic policy instruments and evaluation methods was discussed. These discourses related to the use of specific selection criteria by various actors involved in decision-making and the resulting optimising of instruments and methods, to the meaning of specific selection criteria (a.o. that of efficiency), the institutionalisation of instruments and methods and the corresponding degree and level of discourse and the suitability of instruments and methods for specific aspects of and approaches in water management. In that subsection, for each of the specific discourses, a number of propositions and related research questions were posed. The answers to these propositions and questions will be given here on the basis of empirical analysis.

DISCOURSE ABOUT SELECTION CRITERIA AND OPTIMISING

The expectation that various actors involved in decision-making about the implementation of instruments and methods emphasise different criteria and often hold different views on the meaning of a specific criterion can be confirmed. Logically, whereas policymakers often emphasise the criteria on which an instrument has an (theoretical) advantage over other criteria, opponents usually stress the expected negative impact on especially the position of target groups, economic sectors and the Dutch economy as a whole. Besides emphasising different criteria, advocates and opponents may also hold different opinions about the performance of an instrument or method with regard to the same criterion. These different opinions often come forth from a different interpretation of the meaning of that criterion. As a result, different story lines about one criterion may exist in the discourse about the instrument or method. An example of such a criterion is that of efficiency, which will be discussed below.

With regard to the phenomenon of optimising, it can be stated that the dominant strategic discourse in Dutch water management is that central economic steering instruments never function optimally, and that their sub-optimal functioning causes undesirable and unfair side effects, especially on the economy. Because of their sub-optimal functioning, opponents often regard the arguments used for advocating these instruments as misleading arguments, and these opponents express their doubts about the true motives of policymakers for advocating these instruments in the discourse. The result of this struggle for discursive hegemony is a dominant preference for instruments that are inherently better equipped for operating under sub-optimal conditions. For issues that are addressed at the centralistic level these instruments are suasive instruments, such as covenants about pollution reduction with specific economic sectors, backed up by command-and-control instruments. For issues that

are addressed at the regional or local level, these instruments may belong to any of the categories SIs, CACs and EIs (especially arrangements involving contracts and subsidies), or a combination of these categories.

DISCOURSE ABOUT EFFICIENCY

Efficiency is a selection criterion that was addressed separately, because of its pivotal role in the discourse about economic policy instruments and evaluation methods. This is especially the case for centralistic economic steering instruments, since it is presumed to be the main advantage of this type of instrument over other types. Centralistic economic steering instruments have been implemented in Dutch water management in the most suitable situations already. In these situations, the property rights of the good addressed by the instrument are rather well defined. These situations were mainly ground water extraction and point source pollution. In other issues, the property rights of the good to be addressed are often less well defined, which will lead to a sub-optimal functioning of the centralistic economic instrument. As was mentioned above, opponents of these instruments either use the mediocre performance with regard to efficiency as a counter argument, or marginalize the importance of this criterion and focus on the (negative) performance of these instruments on other criteria, such as fairness and equity.

The expectation uttered in chapter 3 that the criterion of efficiency is given different meanings by actors with diverging interests was supported by empirical data. On the one hand, actors that aim to reduce government expenditure on the provision of public facilities and aim to expand commercial opportunities for the private sector stress the story line of 'efficiency of market allocation'. Logically, this story line is especially used and supported by economic entrepreneurs. Besides, economy-oriented government institutions (such as the ministry of economic affairs, economic institutes, ministries for specific economic sectors) may also utter this story line. On the other hand, actors that stress the need for market regulation by public authorities from the perspective of the protection of the environment and the depletion of natural resources stress the story line of 'the need for efficient use of natural resources and environmental buffer capacity'. This story line is expressed mainly by environmentally oriented government institutions (such as (parts of) the ministries of VROM and LNV) and environmental NGOs. Whether, according to these actors, this story line is best served via EIs, CACs or SIs may depend on a range of factors, such as the issue at hand and the paradigms of actors involved. In a general sense, it can be stated that actors stressing this story line are likely to support EIs from an ideological point of view, since these instruments operate according to the extended polluter pays principle. This is especially the case for issues addressed at the central level via demand management measures, such as the emission of diffuse pollution.

DISCOURSE ABOUT INSTITUTIONALISATION

From empirical analysis, it can be concluded that economic steering instruments and evaluation methods are increasing in relative importance. At the EU-level, attention seems to be focused on economic policy principles and evaluation methods. Market-based instruments play a secondary role. This focus was explained from the fact that the EU wants to keep a

close eye on sound financial management of water in its Member States. Whereas the international focus in environmental policy on climate change has led to the introduction of market-based instruments (especially permit trading) for addressing this environmental issue, the lower position of diffuse pollution, amongst others of water bodies, on the international agenda for environmental policy has so far not lead to concerted action via market-based instruments. Besides the lower perceived urgency of this issue compared to climate change, this may be explained by the fact that diffuse pollution is a cross-border issue indeed, but not an EU-wide, let alone a global issue, or at least not perceived as such. The focus with regard to diffuse pollution in The Netherlands is mainly on suasive instruments.

A lack of consensus about the design and use of economic policy approaches seems to exist mainly with regard to steering instruments and evaluation methods and not so much with regard to decentral arrangements. Although the cabinet has adopted a guideline for economic evaluation of large infra-structural projects, discourse with regard to the content and role of economic evaluation methods has not stopped. This discourse is mainly being fed by the scientific and administrative arenas and in the societal arena by nature NGOs. Despite the fact that centralistic steering instruments seem to be fairly well institutionalised with regard to their design and scope of application, discourse about their use is still fierce. This contrasts with the application of decentralised arrangements, which, despite of a lack of experience and (thus) institutionalisation, seem to be less controversial. The observations made above deny the proposition about the reciprocal relationship between the degree of institutionalisation and the degree of discourse about the arrangement and the instruments used.

DISCOURSE ABOUT THE SUITABILITY OF ECONOMIC INSTRUMENTS AND METHODS FOR SPECIFIC ASPECTS OF WATER MANAGEMENT

With regard to the discourse about the suitability of policy instruments for various aspects and issues of water management, the following can be concluded. Issues of water shortage and water quality can in principle be addressed via centralistic economic steering instruments, by properly reflecting the scarcity of water and related natural resources in the price of these of these resources or the price of substances and activities depleting or damaging these resources. As was discussed before, whether or not these instruments are used for this purpose and how depends on the outcome of the power struggle between actors within and between various arenas in the given institutional setting. No general conclusions can be drawn on this outcome.

With regard to the issue of excess water, it can be stated that initiatives are being taken to get some 'economic sense' in water management. This economic sense seems to relate mainly to the efficiency of public water management. For example, it is suggested to give areas with a low density of inhabitants and capital investments a lower degree of flood protection than areas with a high density of capital and inhabitants. Besides, suggestions are being made to shift liability for damage due to flooding or water nuisance from the government to those private actors that do not take into account the characteristics of the water system and the suitability of a location from the perspective of the water system into their actions. This situation would result in a *de facto* redefinition and redistribution of

property rights. The 'economic sense' in spatial approaches also lies in efficiently using the scarce resource of land, by combining other land use functions with spatial water management measures, and by not appropriating ownership rights of the land for these purposes but instead appropriating only disposition and/or use rights. Besides, these spatial approaches aim to make the value of water for other land use functions and private water use functions more explicit. Often, this is not done in a direct way by valuing the value of water via methods for nature valuation, since these methods are too complex and controversial. Rather, this is done in an indirect way, for example by letting economic actors, such as project developers or recreational entrepreneurs, estimate whether or not the benefits of commercial exploitation of the area outweighs the costs they have to make for providing or allowing for public water management facilities. Spatial approaches to the issue of excess water (can) thus make use of the relative scarcity of resources as well, although via different mechanisms and economic instruments than at the central level. The dominant normative discourse in water systems quantity management at the moment is on regulating supply of instead of regulating demand for water and relating natural resources. As a consequence, with regard to this aspect of water management, the discourse about efficiency is not really about efficient use of natural resources, but mainly about the efficient use of the public budget for water management.

8.7 CONCLUSIONS WITH REGARD TO THE CENTRAL RESEARCH QUESTIONS

8.7.1 ANSWERING QUESTIONS B AND D

In chapter 1, the central research question and a number of sub-questions were formulated. The central research question cannot be answered directly. The best way to answer this question is by answering the related sub-questions. The sub-questions were divided into 3 categories. The first two categories (a and b) served as a basis for answering the questions in category c), relating to the application of economic policy instruments and evaluation methods in Dutch water management. These categories were already addressed in previous chapters, and will not be repeated here. Sub question a) was also theoretical in nature and the answer to this question will not be repeated either. Questions b, and d were empirical in nature. These questions will be addressed below. Answering question c can be regarded as the final step towards answering the main research question. Therefore, this question will be addressed separately and more extensively.

Question b ('to what extent are economic principles, instruments and methods applied in the practice of Dutch water management?') cannot be answered in a quantitative way. This was not the intention of this thesis. However, in a qualitative way, three conclusions can be drawn from the comparison of various levels of policy and the comparison of various countries. The first is that the number of economic steering instruments in Dutch water management is above average. However, the range of economic steering instruments addressing diffuse pollution is below average. Theoretically, the range of economic steering instruments could thus be expanded. The second conclusion is that the economic policy principles formulated at EU-level and adopted at the national level could be applied in a more stringent manner, especially at lower levels of governance. Thirdly, it can be concluded that

new initiatives are taken to introduce economic approaches in Dutch water management, especially at the local level.

Question b ('what role do economic policy principles, instruments and methods applied in Dutch water management play and how are they designed for that role?') and d ('how can the role and content of economic instruments and methods in Dutch water management be explained') are shortly addressed here in a joint manner. In answering both questions, it can be stated that enhanced efforts are made to internalise externalities (both positive and negative), both in steering private actor behaviour (via economic steering instruments), and in evaluating public measures (via evaluation methods). These efforts can partly be described to the introduction of the concept of integrated water management. However, the introduction of the concept of integrated water management is not the only factor influencing the role and content of economic instruments in water management. Other factors (especially trends in governance) influencing the content and role of economic instruments in water management are rationalisation (especially economisation) of society, deregulation (which may serve several purposes, such as decreasing liability of public water managers, increasing the efficiency of public water management, increasing its effectiveness and 'internalisation' of sustainability among target groups of policy), the focus on efficiency of water management and internationalisation. Broadly speaking, these trends are used by two policy coalitions. On the one hand, the policy coalition of 'economy', using these trends as an argument for less government intervention and more opportunities for the private sector. On the other hand, the policy coalition of 'nature', using these trends to stress the value of aquatic ecosystems and to get more 'ecological or environmental rationale' into water management. The content and role of economic policy instruments and evaluation methods is the outcome of the struggle for hegemony between the various policy coalitions involved, of which the two mentioned above are the main ones. At present, the political climate favours the interpretation of these trends by the 'economy'-coalition. However, what the outcome of this struggle is or will be cannot be answered in a straightforward way. Too many factors play a role and the factors differ too much between issues, arrangements and instruments to draw straightforward, generalised conclusions. However, the analysis of the factors playing a role in decision-making about economic policy instruments and methods according to the analytical framework of this thesis helped gain a detailed understanding of these processes and helped explain their outcomes.

8.7.2 ANSWERING QUESTION C

In chapter two, a number of core principles and concepts of integrated water management was presented. In this subsection, I will discuss the relationship of the three types of economic instruments and methods discussed in this thesis (centralistic steering instruments, decentralised arrangements and evaluation methods) with these principles and concepts in order to draw conclusions about their contribution to integrated water management. This discussion relates to sub-question c): 'what contribution do economic policy instruments and evaluation methods make in Dutch water management to integrated water management?'. First, I will discuss the degree to which Dutch water management complies with the policy principles formulated in chapter 2 for making integrated water management operational. Then, I will discuss the degree to and way in which economic instruments and methods in Dutch water management contribute to making the dominant

interpretation of integrated water management as formulated in *NW4* (namely internal and external, horizontal and vertical integration of policy) and a number of related central concepts operational. Finally, I will address the degree to which these instruments and methods comply with the central characteristics of interactive water management as presented by Van Ast (2000).

POLICY PRINCIPLES FOR INTEGRATED WATER MANAGEMENT

Policy principles for integrated water management were introduced in subsection 1.4.5. Below, the 'performance' of the economic instruments and methods with regard to these policy principles will be discussed.

Sustainable development

With regard to sustainable development, Saeijs and Van Ast (1996) mentioned that the concept of sustainability was elaborated in *NW3* into ecological goals. Such ecological goals can be strived for via both centralistic EIs and decentralised arrangements. A spatial approach via decentralised arrangements for water management is only useful in realising these goals if the relationship between emission and immission is local in nature. Otherwise, centralistic instruments are probably more effective. Another aspect of ecological goals is creating the right physical circumstances for (healthy and resilient) ecosystems to develop. In this respect, centralistic steering instruments for environmental policy don't play a role. This aspect may well be achieved via decentralised arrangements. Besides, economic evaluation methods may play a role in achieving ecological goals if the value of these ecosystems is somehow incorporated in the economic evaluation of comprehensive projects, in which eco-systems realisation is but one of the goals, or in the comparison of projects with diverging goals.

Obligation to care for the environment

This principle is more relevant for decentralised arrangements and economic evaluation methods than for centralistic instruments, since in the latter, the care for the environment is the inherent purpose of the instrument. The degree to which the care for the environment is incorporated in decentralised arrangements and evaluation methods depends on the type of polluter/user pays principle on which the arrangement is based and the degree to which environmental concerns are expressed in monetary terms, respectively. The degree to which this is the case was discussed extensively in chapters 4 to 6 and will not be repeated here. However, it can be said that for both arrangements, this is an important point of attention.

Precautionary principle

This principle is followed more automatically by centralistic instruments than by decentralised arrangements. Centralistic instruments as discussed in this thesis operate according to the extended PPP, which is more preventative in nature than the standard PPP. Whether or not decentralised arrangements and economic evaluation methods operate according to the precautionary principle depends on their design and role. With regard to decentralised arrangements, it was shown that some arrangements (especially area development projects) might operate according to the extended PPP, while others (especially management

arrangements) operate according to the standard PPP. Besides, some arrangements are directed at water retention (which is preventative in nature), while others are directed at water storage, or at enlarging discharge capacity, which is (more) curative in nature. The 'performance' of economic evaluation methods with regard to this principle depends on the risk attitude of the paradigm the method is based on. As was discussed before, modernist approaches to economic evaluation methods were risk seeking in nature with regard to the use of natural resources and environmental buffer capacity, since it was believed that man-made capital and natural capital were perfectly substitutable. In project evaluations, more and more often attempts are made to more explicitly incorporate the limits to the resilience of aquatic ecosystems and the value of these systems into these evaluations. However, so far, other methods are still required besides economic evaluation to safeguard this point of attention, since it is not sufficiently possible yet to incorporate these aspects in economic evaluations. Formal positions of the central government towards economic evaluation methods are still more based on the environmental protection paradigm (and neo-classical economics) than on the eco-development paradigm (and more related schools of economics, such as ecological economics).

Compensation principle

With regard to the compensation principle, centralistic economic instruments focus on compensation of ecological damage by economic actors, while decentralised economic instruments mainly focus on compensation of economic and ecological damage by water management measures to land use functions. Economic evaluation methods may pay attention to both. The reason for this difference in emphasis is the policy paradigm (and related principles) on which these arrangements are based. With regard to centralistic instruments, compensation is based on strong sustainability, and (therefore) explicitly directed at the ecological dimension of sustainability, while compensation in decentralised arrangements and economic evaluation methods depends on the type of sustainability (strong or weak) adhered to and the related focus on the ecological, economic or social dimension.

Stand-still principle

Centralistic economic instruments aim to effectuate this principle, or even improve the quality of the environment. Whether decentralised arrangements also abide by this principle depends on the purpose and (thus) the design. Arrangements for water quality management are more likely to have the purpose of improving environmental quality than arrangements for water quantity management. With regard to water quantity management, arrangements aimed at storage are more likely to violate this principle than arrangements aimed at retention. With regard to economic evaluation of public projects, the performance depends on the design. Methods evaluating public initiatives for water quality management are likely to incorporate environmental or ecological effects. For initiatives for water quantity management or other policy domains, this is not automatically the case.

Uniformity of interest, payment and influence

With regard to this principle, it can be remarked that in water systems quantity management there is often a more direct relationship between the elements 'interest' and 'payment' than in water systems quality management. The interests in water systems quality management

are often general in nature (i.e. not specified for specific land use purposes), and are typically a general public service. Besides, in water quality management, the polluter pays principle (see below) should have priority over 'interest, payment, influence'. In water systems quantity management, the 'benefit principle' (see below) and the 'interest, payment, influence'-principle are usually more closely related. Interests in water level management are often more specific in nature (i.e. related to specific land use purposes), and may allow for application of this principle. However, the relationship between interest and payment is less obvious for flood defence management. This counts both for the primary water system and for the secondary system. Firstly, it is often less clear who exactly benefits from these measures (generally speaking downstream inhabitants). This may be more easily assessed for tertiary systems. Secondly, it is more ethically questionable whether or not this service should be financed via this principle. This issue is related to the question whether differentiation in the costs of flood defence management for different areas should be reflected in the contribution of inhabitants of these areas to this public task, or whether flood defence management should be financed from a lump sum budget.

Polluter pays principle

This principle is only relevant for water quality management. As was discussed in this thesis, water quantity management can also influence water quality, but this mechanism has no direct relationship with the polluter pays principle. As was discussed before, centralistic economic steering instruments with a negative incentive operate according to the extended polluter pays principle. Whether decentralised arrangements for water quality management do depends on whether these measures are preventative or curative in nature, and on whether compensation is based on weak or strong sustainability. This issue was already discussed earlier (compensation principle).

User pays principle

The user pays principle is the equivalent of the polluter pays principle for water use and the use of public facilities. The use of public facilities is not always voluntary, and therefore not always suitable for demand management measures. The use of water itself is. In decentralised arrangements, the market-mechanism may apply in case of private water supply and demand. If applied strictly, this principle is just as much directed at sustainability as the polluter pays principle.

Benefit principle

The benefit principle is closely related to the polluter pays principle and the user pays principle. This principle mainly applies to water supply and water level management measures (thus water quantity management). Whether this principle is integrative in nature depends on whether the designation of the land use function to which the water management is adapted is based on a democratic and comprehensive balancing of interests or one can instead speak of undemocratic client politics. No link exists between this principle and centralistic instruments as discussed in this thesis. A relationship may very well exist with decentralised arrangements, especially those directed at water quantity management. The relationship with economic evaluation methods is that the actors that benefit from the project should pay for all costs, including those for compensation, transaction costs,

etcetera. However, it must be noted that many such projects at the national and even regional and local level are of general interest, which makes it hard to apply this principle.

Decentralisation principle

Centralistic economic instruments may operate according to this principle, since the national (or even international) level may be the lowest level at which best to apply these instruments. Besides, these levels may also be the lowest possible level at which to address the issue at hand. However, this is a more subjective assessment. As showed from this thesis, centralistic economic instruments should ideally be applied at the international (EU-) level to avoid cross-border fraud and false competition. However, applying other than centralistic economic instruments may allow for addressing the issues at stake at a lower level of governance. Spatial measures can be applied at several levels: the level of the international river basin and the primary, secondary and tertiary level of national water management. The subsidiarity principle is very relevant for choosing the right level in spatial approaches. Spatial water quantity measures are more location bound and usually more local in nature. It must therefore be watched closely that measures are not addressed at too low a geographic level. This may result in fragmented approaches, which is not in line with holistic principles and concepts, such as the river basin principle, the water systems approach and the principle of not passing on problems. Not passing on problems was explicitly recognised by the *Commissie Tielrooy* (2000) as an important starting point for spatial water management.

The principles discussed above are mainly environmental or ecological in nature and therefore mostly relate to the integration of water and environmental policy. Other principles, such as the ones introduced by the Commission Tielrooy ('retention, storage, drainage' for water quantity management and 'keeping clean, separating, purifying' for water quality management) are more relevant for spatial water systems management, and thus for the integration of water policy and spatial planning. These principles are in principle sustainable (and integrated) in nature, because they give higher priority to preventative measures than to curative ones.

DOMINANT INTERPRETATION IN POLICY

In chapter 1, it was shown that the dominant interpretation of integrated water management as adopted in *NW4* is the horizontal and vertical integration of policy within the domain of water policy and between water policy and other domains. With regard to internal horizontal integration, it can be argued that decentralised arrangements do a better job than centralistic steering instruments. The reason for this is that in decentralised arrangements, various aspects of water management can be addressed at the same time within one arrangement. Centralistic steering instruments are necessarily directed at one specific aspect of water management and therefore do not allow for internal horizontal integration. Of course, they can be part of a mix of instruments, which allows for an integrated, comprehensive approach (an institutional resource regime), but as a single instrument, they are not integrative in nature in this respect.

With regard to internal vertical integration, it can also be argued that decentralised arrangements with a spatial approach allow for better integration between levels of governance than centralised instruments. The reason for this is that with regard to these arrangements the effects of measures at various levels of governance are all interrelated. For example, the sum of measures taken at the local level may have a large impact on water management at the next higher level of water systems and (thus) governance. Besides, with regard to some aspects of water management, spatial measures (such as water storage facilities) may be used in a combined manner for more than one level of water system. Many of the centralistic steering instruments for water management, especially the ones addressing diffuse pollution, are designed and implemented at the national level and have little connection with lower levels of governance. However, there are a number of exceptions in this respect, such as the wastewater levy, which is implemented by water boards, and the ground water extraction charge, which is implemented by provinces. With regard to diffuse pollution, it may be questioned whether there is an alternative approach at lower levels of governance for achieving the same results. For some sources, such as leaching of polluting substances from materials used in water management, buildings and local infrastructure and the use of pesticides for maintenance of public areas, there may be options to address these issues/sources at the local or regional level, but for other sources, such as emissions from traffic, production and consumption systems, a national approach seems more suitable. This national approach does not necessarily have to be economic in nature. Whether an economic evaluation method contributes to vertical internal integration depends much on the geographical scale on which the effects of initiatives are analysed and the involvement of various levels of governance in this process.

With regard to external horizontal integration, we have seen that centralistic economic steering instruments as discussed in this thesis are mainly motivated from an environmental perspective. As such, they mainly stimulate the integration of environmental policy and water management. Besides, they may combine a number of general 'governance goals' in one arrangement (such as revenue raising and greening of the tax system). The decentralised arrangements as discussed in this thesis (aim to) strengthen the relationship between water management and spatial planning. Besides, they allow for the integrated approach to several spatial issues at the same time. As such, they have the potential of being more comprehensive than centralistic instruments. At present, the normative discourse and political agenda focus on this aspect of integration.

External vertical integration can also be referred to as diagonal integration, since 'external' refers to integration between policy domains (which is also referred to as horizontal integration). It can be said that centralistic steering instruments do not really allow for diagonal integration. The reason for this is that the potential number of policy domains involved is limited and the instruments usually operate at one specific level of governance. The potential for diagonal integration is (much) larger for spatial arrangements. For these arrangements, possibilities (and necessity) depend on the scale of the initiatives. Very local initiatives yield little opportunities for involving the provincial or national level. However, large spatial planning programmes, which are usually initiated at the provincial level (such as restructuring former bio-industrial areas) and large water management projects initiated at the national (such as the *Rivierenland*-project) or provincial level in principle allow for the involvement of several levels of governance and several policy domains.

Overall, it may be concluded that decentral arrangements offer better opportunities for integration according to the dominant interpretation in water management (internal and external horizontal and vertical integration). However, as was argued before, these arrangements entail a larger risk with regard to the integration of ecological aspects into water management than do central environmental economic instruments, since these arrangements tend to focus more on the social and economic dimensions of sustainability.

Concepts

In chapter two, a number of concepts was presented that aim to make the concept of integrated water management operational. Many of these concepts are general in nature, referring to comprehensive and integrated approaches. Because of their general nature, they are not regarded as practically applicable operationalisations of integrated water management. Other concepts are more specific in nature, and can thus be regarded as such. These concepts can be summarised in four categories: the 'water systems approach', the concept of 'eco-pragmatism' (representing the 'eco-systems approach' and 'guided eco-system development'), demand management and the comprehensive balancing of interests (see table 3.1.). These categories will be discussed here.

The water systems approach is similar in nature to the principle of not passing on problems. This approach is applicable to both water systems quantity and quality management, as is shown by the triptychs for water quantity and quality management as introduced by *Commissie Tielrooy* (2000). The water systems approach can be used as a guiding concept in spatial approaches to water management, both with regard to water quality and quantity management. For centralistic instruments, this concept is less relevant, at least for as long as international river basin authorities do not have the authority yet to issue their own policy instruments. If they would, for example an emission trading system could be set up at the international river basin level. However, an issue of attention in this respect is that the effects of most diffuse resources are not limited to the environmental component of water only. Setting up a separate arrangement in water management for addressing these substances would not fit the criterion of external integration. This was also concluded with regard to basing a levy for agricultural pollution on the WVO (surface water pollution act). With regard to water quantity management, for example a water use balance could be set up at river (sub-) basin level, regulated by a mix of instruments.

The concept of eco-pragmatism as interpreted in this thesis means that a pragmatic approach is chosen for eco-system management. This can mean several things. Firstly, it can refer to a pragmatic approach to the choice of policy instruments. This means that instruments are chosen that yield the best result for the eco-system at hand. A pragmatic approach in this respect is likely to lead to a mix of instruments. With regard to the efficiency (or cost-effectiveness) of this mix of instruments, it should be watched that the pool of instruments does not become too large and fragmented. Secondly, a pragmatic use of ecosystems can refer to setting realistic goals with regard to the quality of these ecosystems. This may mean that choices need to be made between eco-systems with a high quality and those with lower quality. This may for a large part depend on the designated land use function of the area. From the perspective of water management, in choosing these land use functions, the principle can be maintained that land use functions requiring a high water

quality are situated upstream from those that require lower quality, or those that even pollute the water. This may even mean that the quality standards for downstream ecosystems are chosen to be lower than for upstream systems. Thirdly, eco-pragmatism may refer to the pragmatic use of the ecosystem's goods and services. This means that natural eco-systems are not turned into nature reserves where no one can enter, unless required for the conservation of specific species for achieving biodiversity goals. The pragmatic use of ecosystem goods and services can enhance a broad-spread awareness about the value of these eco-systems for society. Decentralised arrangements are especially suitable for such an approach to eco-systems, because they allow for a tailor-made approach, depending on the land use functions of and quality standards for a specific area. Centralistic instruments may contribute to the conservation of eco-systems, but are in general less tailor-made, less pragmatic, more 'top-down' and more protective in nature. Economic evaluation methods may contribute to awareness raising by explicitly incorporating the (monetary) value of these eco-systems.

Demand management was formulated in the 1990s as the dominant way to raise awareness about the value of water and aquatic ecosystems. This approach was summarised as 'getting the prices right'. Getting the prices right (or in economic terms: internalising externalities), especially with regard to damage to and the value of ecosystems, is the explicit goal of the centralistic economic instruments as discussed in this thesis and the valuation of nature as input to economic evaluation methods. These measures thus contribute to this 'operational concept' of integrated water management. In spatial approaches, the emphasis is not on demand management, but on supply management. Supply management is less clearly related to getting the prices right. However, the debate about how to treat water in these spatial approaches (represented by the three discourses of 'water as a condition', 'water as a service' or 'water as a product') shows that in these approaches the issue of 'getting the prices right' plays a role as well. In this debate, no dominant discourse exists yet. Whether these arrangements contribute to this operational concept of integrated water management can therefore not be concluded yet. It can be argued that demand management need not be a central operational concept for integrated water management. Awareness raising about the value of (aquatic) ecosystems may also be achieved via supply management as presently dominant (especially when made operational according to strong sustainability). Supply management may even turn out to be more effective in this respect, because the execution of this type of water management is more closely related to the daily lives of target groups.

The final category identified above, namely the comprehensive balancing of interests, will be addressed below.

INTERACTIVE WATER MANAGEMENT

As was mentioned in chapter two, according to Van Ast (2000), the horizontal and vertical integration of policy is a too narrow interpretation of the concept of integrated water management. Therefore he introduced the concept of interactive water management, emphasising that not only levels of governance and policy domains have to be integrated, but also that interaction has to be achieved with both eco-systems and society. The interaction with eco-systems was already discussed to some degree above, in discussing eco-pragmatism. With regard to the interaction with society (specific stakeholders and the

general public), generally speaking, it can be said that it is harder to reach 'society' through centralistic steering instruments than through decentralised arrangements. In centralistic approaches, interaction with stakeholders and the general public usually takes place in an indirect way, via the media or representative organisations (corporate governance model). Because of its smaller scale, in decentralised arrangements, direct interaction with stakeholders and the public may often be more easily established (majoritarian politics model). Another advantage of these arrangements is that these arrangements are not based on negative incentives (only), which makes the benefits of such arrangements for direct stakeholders and the general public more explicit and thus easier to see. This is more likely to create public support. The degree of interaction with society in economic evaluations depends on the degree to which specific stakeholders and the general public are involved in the evaluation process. For example, economic valuation of nature can be based on desk studies, but also on interviews with stakeholders. Besides, in some evaluation processes the involvement of the public and other stakeholders has been institutionalised to a certain degree, by allowing for public hearings and objections. The question with regard to this stakeholder-input from the perspective of interactiveness is whether this institutionalised role is merely formal and 'ceremonial' in nature or actually has an impact on the result of the project and its evaluation. Since this aspect of integrated (or rather interactive) water management was not specifically addressed in this thesis, I will not discuss this subject in detail.

CONCLUSION

In conclusion, it can be said that the shift in focus in water management from water quality to water quantity management has resulted in a new focus in the 'operationalisation' of integrated water management. In the early phase of integrated water management, the focus was on integrating water and environmental policy, and thus on the ecological aspect of sustainability. In recent years, the focus has shifted to a spatial approach to water management, and thus to the integration of water and spatial planning policy. In this approach, there is a less ideological, more pragmatic balancing of the ecological, economic and social dimensions of sustainability. The result of this balancing may vary for each specific arrangement. In this balancing process, the representation of the ecological dimension is not as obvious as in arrangements involving centralistic economic steering instruments. The advantage of a pragmatic balancing of the dimensions of sustainability is that stakeholder support is more likely to exist, and trade-offs can be made between arrangements based on weak and strong sustainability. Overall, this may yield better results for the ecological dimension as well.

8.8 APPLICABILITY OF THE ANALYTICAL FRAMEWORK

The main conclusion with regard to the applicability of the analytical framework is that when analysing issues in terms of policy arrangements, the level of analysis has to be chosen carefully. In order to be able to draw a complete picture of policy arrangements and analyse them as a whole, specific issues will have to be the object of analysis. Besides, the application of economic instruments is very dependent on the specific characteristics of the situation. Therefore, it can even be argued that with regard to a specific issue, analysis has

to be restricted to the policymaking process in one actor-network setting within that issue (several actor-networks may exist in relation to one policy issue, since a 'problem' can be caused by multiple mechanisms and actors, causing the dimensions of arrangements and policy instruments involved to be different). This detailed analysis of policy arrangements is especially useful if some idea already exists about the elements of the framework that may play an important or decisive role in the constitution of the arrangement. At the same time, the analytical framework is useful for the stage preceding this, in which there is still a neutral position with regard to the issue and arrangement at hand. In this stage, the analytical framework may help to systematically map factors that influence decision-making about policy instruments. This systematic analysis also allows for comparing factors between various issues and arrangements.

With regard to the policy arrangements in Dutch water management analysed in this thesis, often not all dimensions of the analytical framework were described in sufficient detail to draw a complete picture of the policy arrangements of these issues, the related trends and the position of the individual actors. In other words, not all elements of the analytical framework were analysed in detail or used at all. The description of the elements of the analytical framework was often not complete, and the dimension of 'power and resources', in general, was addressed only to a limited degree. The explanation for the limited depth in which the arrangements were analysed is that it was deliberately chosen to analyse a large number of arrangements in smaller detail rather than a smaller number of arrangements in great detail. The reason for this choice was that this way a good general impression could be obtained of factors influencing decision-making about the design and implementation across various types of policy arrangements and instruments. This corresponds with the purpose of the framework as a tool for 'initial identification of possibly important factors' as mentioned above. The framework as developed in this thesis would surely allow for a more detailed analysis of the policy arrangements in water management as analysed in this thesis. For that purpose, analysis would have to be restricted to a (very) limited number of arrangements.

The nature of the various types of economic instruments discussed in this thesis is so different that a number of technical factors are only applicable to one category of instruments (f.e. dynamic incentive, price-elasticity, perverse incentives, and revenue raising characteristics for centralistic steering instruments; cost-benefit balance for economic evaluation; specifications of contracts for decentralised arrangements). On the other hand, some technical and most political criteria are applicable to all instruments. Examples of general technical criteria are (environmental and cost-) effectiveness and flexibility. Examples of general political criteria are open and transparent decision-making processes, concordance, compensation of target groups, equity, fairness, sustainability, integrativeness, public and stakeholder participation and public and target group support. Both different and similar criteria may generate interesting insights in factors that influence the content, role and acceptance of the arrangements discussed. The distinction between technical and political criteria as used in this thesis turned out to be somewhat arbitrary. These criteria are usually closely interrelated. Often, technical criteria turn into political criteria as soon as they become subject of debate. As long as technical characteristics are not based on institutionalised assessment methods, this is likely to be the case. Vice versa, political criteria determine the relative importance of technical criteria.

The analytical framework developed in this thesis, and especially the concept of policy arrangements, facilitated the systematic identification of contextual factors influencing the choice of policy instruments. The analytical framework constructed in chapter 3 was based on several other theories, but adapted to make it more suitable for the identification of factors that play a role in the application of especially economic policy instruments. This elaboration (operationalisation) specifically related to economic aspects of paradigms about the man-nature relationship, trends with an economic dimension and economic aspects of the formal institutional framework. In chapter 2, attention was paid to the theoretical characteristics of economic evaluation methods and policy instruments and to the selection criteria for policy instruments. The combination of the micro-level criteria and meso-level elements of policy arrangements enabled the analysis of the relationship between the characteristics of the policy instruments themselves (technical characteristics) and dimensions of the policy arrangement (political factors). Operationalisation of the micro-level describing the motives, interests and strategies of individual (groups of) actors was an enrichment of the actor-dimension of the analytical concept of policy-arrangements as presented by Van Tatenhove et al. (2000), giving it more depth and meaning. It helped understand and (thus) explain the influence of actors on the specific construction of arrangements. By including the macro-level of analysis, the influence of generic developments in society and governance on decision-making processes about single arrangements could be analysed. This thesis showed that sometimes, this macro-level played a very important role in this respect, mainly as a consequence of different (and often conflicting) interpretations by the actors involved of the way to respond to these macro-level developments. By elaborating the relationships between these levels of analysis, the analytical framework enabled multi-level analysis with regard to the identification of themes and patterns in decision-making. As such, (amongst others) the motives of specific actors (policy coalitions) for advocating or rejecting specific policy instruments could be more easily retrieved. Motives of individual or groups of actors and the way these motives are translated into discourse, are binding elements between the levels of analysis. This element is often not addressed by more technical analytical frameworks for policy analysis.

The position of the analytical framework of this thesis relative to policymaking theory and the practice of (Dutch) water management can be indicated as intermediary. The framework aimed to make a rather theoretical framework, which did not show a large degree of detail, operational for the object of analysis by identifying and testing (categories of) characteristics (manifestations) of the dimensions of this framework and the relationships between these elements. The level of detail with which this was done enabled its use for gaining a comprehensive insight in factors. As such, it can be applied to a broad range of policy arrangements involving economic steering instruments and evaluation methods and their comparison. By applying a number of adaptations, it could also be applied to arrangements involving other types of instruments and methods and their comparison. As was mentioned before, however, the large number of arrangements analysed limited the depth of the analysis of each of these arrangements. Therefore, by focusing on only one or a very limited number of arrangements, the framework could be specified in more detail, and the meaning of the framework for a real in-depth understanding of mechanisms (themes and patterns) within single policy arrangements could be enhanced.

8.9 RECOMMENDATIONS

The conclusions listed above lead to a number of recommendations. The recommendations are divided into recommendations for policymaking and recommendations for further research.

8.9.1 RECOMMENDATIONS FOR POLICYMAKING.

In order to obtain clarity in the financing structure of water management, the priority order of policy principles and financing principles in Dutch water management should be clear. At present, potentially conflicting principles have equal status. This can lead to a lack of transparency and result in sub-optimal use of water systems.

As we have seen in this thesis, ideologically based policy as formulated at higher levels of governance is often flawed at lower levels of governance because of the more pragmatic and opportunistic considerations in decision-making at this level. Besides, elements of policymaking are subject to considerable temporal fluctuations due to fluctuations in political climate. Safeguarding a long-term, sustainable vision on water management may be achieved by choosing 'eco-pragmatism' as the leading (dominant) paradigm for policy approaches and thus for decision-making regarding water related policy issues. Such an approach would institutionalise long-term attention for the quality of (aquatic) ecosystems, including in economic analysis, evaluations and in the use of economic steering instruments. In order not to let water management be influenced by political fluctuations, institutions would need to be erected that have as their primary task the formulation and safeguarding of a long-term vision on water management, based on sustainability principles. At present, this task is performed by international and national institutions for strategic policymaking in the scientific arena (universities and research institutes), the administrative arena (such as permanent advisory organisations and commissions), consultancies (especially for the development of new concepts) and environmental and nature NGOs. Whether the present system for the generation and representation of long-term visions is sufficient to outweigh short-term considerations was not an explicit part of this thesis.

8.9.2 RECOMMENDATIONS FOR FURTHER RESEARCH

With regard to further research, the following recommendations can be made:

Firstly, more study may be directed at possibilities for stimulating public private partnerships and blue services in water quantity management. For example, pioneer projects could be supported with positive financial incentives or a financial risk-insurance in order to step over the threshold of financial risks. Besides, this research could be directed at the analysis of institutional obstacles and the way these can be circumvented or take away.

In policy analysis, more attention should be paid to the interaction between the micro-, meso- and macro-level. This thesis showed that the analysis of this interaction can lead to interesting new insights and understanding of factors that play a role in policymaking and implementation in general, and the choice for and design and role of policy instruments in particular.

The analytical framework developed in this thesis could be used for more detailed analysis of specific policy arrangements, either or not involving economic policy instruments or evaluation methods. Once an initial understanding ('picture') has been created of important factors influencing the choice and design of policy arrangements on the basis of the comprehensive framework, this framework may be narrowed down and made operational in more detail to enable a more in depth analysis of these factors and their relationships. This would facilitate a truly detailed understanding of the policymaking process in terms of mechanisms, themes and patterns.

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LIST OF ABBREVIATIONS

a.i.	= active ingredient
a.o.	= amongst others
B.O.D.	= Biological Oxygen Demand
BS	= Blue Services
CAC	= Command And Control (-instrument)
CBA	= Cost-Benefit Analysis
CEA	= Cost-Effectiveness Analysis
CEI	= Centralistic economic instrument
C.O.D.	= Chemical Oxygen Demand
DEI	= Decentral economic instrument
DWA	= <i>Droog Weer Afvoer</i> (dry weather sewer discharge)
EEM	= Economic Evaluation Method
EI	= Economic Instrument
EHS	= Ecologische HoofdStructuur (see EMS)
EMS	= Ecological Main Structure (see EHS)
EPPP	= Extended Polluter Pays Principle
EU	= European Union
f.e.	= for example
i.e.	= inhabitant equivalent (<i>inwoner equivalent</i>)
ICT	= Incomplete Contract Theory
IPO	= <i>InterProvinciaal Overleg</i> (umbrella organisation of provinces)
IRR	= Institutional Resource Regime
LNV	= Ministry of Agriculture, Nature management and Food Quality
LTO	= Land- en Tuinbouw Organisatie (Union of Agri- and Horticultural Business)
MDW	= Marktwerking, Deregulering en Wetgevingskwaliteit (Market approach, Deregulation and Legislative quality)
MINAS	= MINeralen Accounting Systeem (Mineral Accounting System)
MS	= EU Member States
NGO	= Non-Governmental Organisation
NIE	= New Institutional Economics
NW4	= <i>Vierde Nota Waterhuishouding</i> (Fourth White Paper on Water Management)
PKB	= <i>Planologisch KernBeslissing</i> ('Spatial planning key decision')
PPP	= (a) Polluter Pays Principle (b) Public Private Partnership
PvA	= <i>Plan van Aanpak</i> (project plan)
RI	= Regulative Instrument
RWA	= <i>RegenWater Afvoer</i> (rainwater sewer discharge)
SGI	= Service of General Interest
SI	= Suasive Instrument
SCBA	= Social/Societal Cost-Benefit Analysis
SPPP	= Standard Polluter Pays Principle
TCT	= Transaction Cost Theory

TEC	= Treaty of European Communities
UPP	= User Pays Principle
UvW	= <i>Unie van Waterschappen</i> (Union of Water boards)
V&W	= Ministry of Transport, Public Works and Water Management
VNG	= <i>Vereniging van Nederlandse Gemeenten</i> (umbrella organisation of municipalities)
VRM	= Ministry of Housing, Spatial Planning and the Environment
WATECO	= EU working group for WATER and ECONomics
WB21	= <i>WaterBeheer in de 21ste eeuw</i> (water policy agenda for the 21 st century)
WBB	= <i>Wet BodemBescherming</i> (Act on soil protection)
WBM	= <i>Wet Belastingen op Milieugrondslag</i> (Act on Environmental Taxes)
WFD	= EU Water Framework Directive
WM	= <i>Wet Milieubeheer</i> (Environmental management act)
Wrt.	= With regard to
WVO	= <i>Wet op de verontreiniging van oppervlaktewater</i> (Surface water pollution act)
WWTP	= Waste water treatment plant

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ANNEX I: CRITERIA FOR AND CHARACTERISTICS OF ECONOMIC ANALYSIS AND ECONOMIC POLICY INSTRUMENTS

Aspect	Criteria	Explanation/comment
Economic analysis of societal phenomenon	<ul style="list-style-type: none"> - relative scarcity - alternative usability - rankability 	
Conditions for perfect competition (efficient allocation)	<ul style="list-style-type: none"> - large numbers of buyers and sellers - perfect (and costless) information - individual ownership (well defined property rights) - full costs reflected in market prices (no external effects) 	Perfect competition enables the application of instruments for environmental policy based on (neo)classical assumptions. The application of these instruments is legitimised from the perspective that the last condition is not met (and perhaps neither are others). However, the application of such instruments distorts the markets they are directed at
Conditions for well defined property rights	<ul style="list-style-type: none"> - universality - exclusivity - transferability - enforceability 	Ownership is completely specified and the same anywhere; Those who don't hold property rights can be excluded from disposition and use; Property rights (ownership, disposition and use rights) can be transferred from one legal entity to another; Violation of property rights can be punished
Potential merits of economic policy instruments	<p>Effectiveness</p> <p>Efficiency</p> <p>flexibility</p> <p>Incentive</p> <ul style="list-style-type: none"> - continuous incentive for innovation - behaviourally relevant incentive <p>Low enforcement efforts</p> <p>Revenue raising property</p> <p>Full cost recovery</p> <p>Integration</p>	<p>Depends on price-elasticity</p> <ul style="list-style-type: none"> - static aspect: lower administration costs; - dynamic aspect: lower costs for achieving (environmental) technological innovation/diffusion; <p>In theory leaves choice to target group;</p> <p>Incentive for (environmental) technological innovation/diffusion modifying behaviour, objectives, institutional arrangements</p> <p>Linked to existing tax system</p> <p>Counts for instruments providing negative incentive;</p> <p>Recovering all costs of (public) management (including environmental costs)</p> <p>Integrating environmental policy into other policy domains (making environmental policy an implicit part of other domains)</p>

	Internalising externalities	<p>Incorporate aspects that were previously left out of the decision-making process. Counts for economic aspects of decision-making, or for decisions of economic actors;</p> <p>Economic instruments are presumed to be more in line with a preventive approach than CAC-instruments</p> <p>Chance of evading taxes is lower than chance of evading CAC</p> <p>Potential reduction of associated pollutants</p>
Potential disadvantages of economic instruments	<p>Information costs</p> <p>Environmental effectiveness risk</p> <p>Target group protests</p> <p>Lack of transparency about motives</p> <p>No interactive approach</p>	<p>Calculation of marginal environmental cost of pollution for setting a charge rate requires lots of information; high or even prohibitive information costs;</p> <p>Protest from the perspective of equity and/or fairness;</p> <p>May results in lack of target group support</p> <p>Neo-classical instruments for environmental policy are top-down in nature</p>

ANNEX II: IDENTIFICATION OF ELEMENTS OF THE ANALYTICAL FRAMEWORK

Element	Secondary element/specific manifestation	Characteristic	Possible categories
Policy issue		Object of policy	Effect of society on environment (resource depletion, pollution, usurping buffer capacity), effect of environment on society (excess water, drought)
		Location bound/-specific? (spatial variation)	General vs. local phenomena (f.e. point source vs. diffuse pollution)
		Scale of impact ?	Local, regional, national, international, global
		Duration of impact/time-scale of effects?	Temporary or structural/pervasive?
		Age of issue?	

Public policy addressing the issue		History of public policy	Institutions
		Basic strategy	Public initiative or influencing behaviour of private actors
		Addressing phase in cycle?	Preventative (addressing roots) or reactive (addressing symptoms)
		Initial description of current policy (elements of policy)	Institutions
		Number of policy alternatives	
		Primary policy goal?	Environmental effect, safety, water provision, etc.
		Secondary policy goal(s)?	Revenue raising, cost-effectiveness, etc.
		Position on political agenda	(Ontological) Discourse
		Policy instrument/ evaluation method at stake	Institutions
		Level of policymaking	International, national, regional, local, combined
		Level of governance	Idem
		Concordance	Does suggested policy entail a radical change from current practices?
		Stability of existing arrangement?	

Element	Secondary element/specific manifestation	Characteristic	Possible categories
Policymaking process		In which phase?	
		Which actors involved?	
		Which style of policymaking?	Hierarchical, egalitarian, corporate. See also 'strategy'

Stakeholders	Actors	Number of actors	
		Number of policymakers/ target groups	
		(Power) Position in process	Primary or secondary actor?
		Degree of organisation/ representation	Well, a little or not organised/ represented
		Belief systems	What belief system do the actors have (deep normative core, near policy core, secondary aspects)?
	Interests	Interest of actor in issue?	Ideological or pragmatic
	Goals	What is the actor's goal?	Idem; Primary goal of (integrated) water management, or secondary goal (related to governance)? Formal policy goal, or informal (individual) goal?
		Effect of (proposed) policy on actor/achievement of goal(s)?	
	Position	Position wrt. EI/EEM	
	Motives for position	Level of ambition wrt sustainability (which policy paradigm adhered to?)	No, weak or strong sustainability. (type of policy paradigm)
			Opportunistic or ideological motive
Strategy	See further below		

Discourse	General	About which goal?	Primary and secondary policy goal
		Type of discourse	Strategic, normative or ontological discourse
		Level at which discourse is held, arena(s) of discourse and degree of consensus in arenas	Level: international, national, regional, local; Arenas: societal, political, scientific, administrative
		Dominant discourse?	
		Nature of discourse	Focus on win-win, win-loose or loose-loose? (focus on differences or similarities?)

Element	Secondary element/specific manifestation	Characteristic	Possible categories
Discourse (continued)		Focus of discourse	Does discourse focus on ecological, economic, environmental, social or cultural aspects, or on a combination of these aspects?
		Degree of consensus in discourse (ontological, normative and strategic)	Complete consensus, some consensus, no consensus
		Stability of dominant discourse	
	Story lines	Number of story lines	
		Focus of story lines	
		Use of concepts and other elements of policy in story lines	
		Which story line by advocates and opponents of economic approach (instrument/method) ?	
		Which paradigms underly these story lines?	
	Discourse about scale and time	Time and scale of effects of issue and policy (sustainability, risk-attitude)	
	Discourse about integrated water management	Does integrated water management play a role in the discourse?	
		Which aspects of IWM play a role?	all interests all effects all values
		Consensus about interpretation and operationalisation of IWM?	
	Discourse about an economic approach (normative discourse)	Which scientific and policy paradigms are involved in the discourse about the issue at hand?	Only economic paradigms, or also others? What is the balance between these paradigms?
		What consequences does this have for discourses about the economic approach?	Focus on strong, weak (compromise) or no economic approach
	Discourse about selection criteria and optimising	What preconditions follow from secondary goals for achieving primary goal?	
		Which selection criteria (thus) play a role?	Technical discourse about suitability of economic approach or discourse about political criteria?

Element	Secondary element/specific manifestation	Characteristic	Possible categories
Discourse (continued)		Dominant discourse with regard to ranking and score of criteria? Consensus in discourse?	
	Discourse about efficiency	Different interpretations about efficiency	Efficiency of resource use or efficiency of use of public financial resources? Focus on economic or political efficiency?
	Discourse about (institutionalisation) of EI/EEM	Which story lines exist about the economic approach	Pro-, anti-, neutral;
		Focus of discourse	Discourse about role (or type) of instrument or on content?
		Degree of consensus	See elsewhere
		Relative importance of economic approach	
	Discourse about suitability of EIs and EEMs for IWM		No, minor or major issue. Major issue: degree of consensus?

Impulses for change	General	Role in discourse	Discourse
Impulses for change: exogenous factors	Societal trends	Which trends influence discourse?	Scientification, economisation, efficiency, ecological modernisation, emergence of post-material values
	Natural trends		Climate change Trends resulting from water management
	Trends in governance (political modernisation)	General	More market, more private actors performing public tasks, top-down, bottom-up, deregulation, etc.
		Internationalisation? Structural redistribution of resources?	
	Shock events	Reaction?	Symptomatic/structural
Impulses for change: endogenous factors		Consequence of (which) exogenous factor?	
		Impact on choice of instrument/ method?	

Element	Secondary element/ specific manifestation	Characteristic	Dimension of analytical framework
Institutions	General	Degree of institutionalisation of issue (dominant discourse)	None, in informal institutions, in formal institutions
		Type of institutions	Institutions regulating process or content? Formal or informal? Generic or specific?
		Institutions regulating the use of natural resources	Institutions granting right to pollute and use environment or institutions limiting the right?
		Rules regulating the process	Decision-structure, agenda control, actors involved, role of actors
	Informal institutions : paradigms	Paradigms that play a role in various arenas	Scientific paradigms, policy paradigms (regarding man-nature relationship)
		Divergence of paradigms	Very opposing, slightly opposing, no opposing paradigms
		Dominant paradigm(s)	
	Formal institutions (general)	Level of institutions	Issue regulated by collective or inter-individual institutions, or a combination of both?
			Institutions issued at which level of governance?
	Formal institutions: political rules: laws, standards	Political rules to complement private property rights (institutional resource regimen)	
		Specificity of law:	Addressing specific issue, or generally applicable?
		Type of institutions regarding policy instrument or evaluation method	Institutions regulating role or instrument or content?
	Formal institutions: economic rules	How well have property rights been defined?	Ownership, disposition, use
		What market institutions are already in place?	
	Formal institutions: contracts	What type of contracts involved in exchange?	Complete, incomplete, structural
	Formal institutions: elements of policy: policy principles	Duration of use (steady factor?)	
		Legitimation of principle	
Operationalisation of policy		In line with or opposed to principles?	
Formal institutions:	Resulting institutional resource regime?		
Arrangement	Opportunity for public party to change institutions?		

Element	Secondary element/ specific manifestation	Characteristic	Dimension of analytical framework
Resources	General	How used	Used to support or oppose to dominant discourse/existing policy?
		Concentration of resources	Resources concentrated or dispersed?
		Any crucial resources involved? Does public party hold crucial resource?	
		Strategic use of resource	Focus on discourse or on institutions?
		Balance between use of story lines in discourse and use of other resources	
	Story lines	Which element in story line?	Fundamental or pragmatic arguments?
	Institutions	Existing institutions acting as important resource?	a.o. property rights of natural resource, public rules
	Information	Distribution of information	Information symmetry or asymmetry?
		Information shared?	
		Organisations with 'information/ knowledge authority'?	
		Availability of information	
		Importance of scientific information	
	Which scientific disciplines/schools dominate?	Economic, other (specify)	

Strategy	General	Risk strategy	Risk seeking or risk-avoiding?
		Strategic use of resources	
	Strategy of public organisation(s)	Style of governance	Top-down (closed) planning or open planning process? Voluntary arrangements or forced involvement/exclusion of private actors?
			Degree of freedom granted to target group(s) of policy?
	Coalitions?	Existence of coalitions	'New' or 'old' coalitions?
			One coalition or several (opposing) coalitions
		Degree of organisation of actor(coalition)s	
		Degree of congruence of interests	Same or different ideologies within coalition? Same or different policy goal(s)
Effects	What effects do strategies of actors have on other actors?		

Element	Secondary element/ specific manifestation	Characteristic	Dimension of analytical framework
Power	Power balance	Degree of concentration	Concentration or dispersed?
		Which elements determine power balance?	Resources or institutions? (relational or structural phenomenon)
		Any decisive actors? What are the beliefs/what paradigm do they adhere	

Governance arrangement		Resulting type of arrangement	New arrangement or traditional arrangement?
			Complexity or arrangement? Centralistic or decentralised?

Characterisation of the role of EI or EEM		Serving which goal(s)?	Contributing to primary goal of IWM or to secondary goal of Dutch water management/public governance in general?
		Serving which actors and how?	Number and type of actor(s) positively and negatively affected
		Which factor dominant in determining content and role?	Element(s) of framework and/or relationship(s)
		Degree in which arrangement serves integrated water management	scope of application ('holisticness') design (a.o. 'all interests') attributed role (a.o. 'all effects' and 'all' values)

The main elements thus to be identified, characterised and analysed in empirical analysis are:

- The policy *issue* at hand;
- Public *policy* addressing the issue;
- The policymaking *process* regarding the issue;
- *Actors* involved in the policymaking process and coalitions they make;
- *Discourse* about (policy for) the issue and the story lines used by the actors involved;
- The role of *impulses for change* in discourse;

- *Institutions* addressing the policymaking process and institutions as an outcome of policy;
- *Resources* available and used by actors involved;
- The *strategy* used by actors and actor coalitions based on the availability of resources;
- The *power* resulting from the use of resources and the power balance resulting from it;
- All the *relationships* between these elements (the arrangement), and finally;
- The *role of the EI or EEM* at hand in addressing the issue (a.o. with regard to integrated water management), resulting from the above.

ANNEX III: OVERVIEW OF WATER RELATED ENVIRONMENTAL TAXES AND CHARGES IN EU AND EEA COUNTRIES, AS OF OCTOBER 1996²¹²

Country	A	B	D	Fi	Fr	Ge	Gr	Ic	Ir	It	Li	Lu	Ne	No	P	Sp	Sw	U
Environmental Tax measure																		
Motor Fuels																		
Leaded/Unleaded (Differential)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Diesel (Quality differential)			x	x							x						x	
Carbon/Energy taxation			x	x							x		x	x			x	
Sulphur tax																	x	
Other excise taxes (other than VAT)	x	x	x	x	x	x	x	x	x	x		x	x	x	x		x	
Gasoline (quality differential)				x													x	
Other energy products																		
Other excise taxes	x	x	x	x	x	x	x		x	x		x	x	x			x	
Carbon/Energy taxation	x		x	x									x	x			x	
Sulphur tax														x			x	
No _x charge																	x	
Vehicle Related taxation																		
Sales/Excise/Regist. Tax diff. (cars)	x	x	x	x			x	x	x	x	x		x	x	x		x	
Road/Registration tax diff. (cars)	x	x	x					x	x	x			x	x			x	
Agricultural inputs																		
Fertilisers																	x	
Pesticides			x	x													x	

²¹² The objective of this table is to give a schematic overview of the use of environmental taxes and charges in different countries. The design, the structure, the rates, etcetera differ from country to country

	A	B	D	Fi	Fr	Ge	Gr	Ic	Ir	It	Li	Lu	Ne	No	P	Sp	Sw	U
Other goods																	X	
Batteries	X		X					X			X							
Plastic carrier bags	X	X	X					X			X							
Disposable containers	X		X	X				X			X							
Tires			X					X			X							
CFCs and/or halons	X		X					X			X							
Disposable razors	X		X					X			X							
Disposable cameras	X		X					X			X							
Lubricant oil charge				X				X			X							
Oil pollution charge			X	X				X			X							
Solvents			X					X			X							
Direct Tax Provisions																		
Env. Investments/ accelerated depreciation	X		X	X	X								X					
Employer-paid commuting expenses part of taxable income	X		X	X		X							X				X	X
Air transport																		
Noise charges		X			X	X							X				X	
Other charges													X					
Water Charges and Taxes																		
Water charges			X	X	X	X					X			X			X	X
Sewage charges			X	X	X	X		X			X			X			X	X
Water effluent charges			X	X	X	X					X			X			X	X
Tax on groundwater extraction			X		X	X					X			X			X	X
Manure charges													X					
Waste disposal and Management Charges																		
Municipal waste charges			X	X	X	X		X			X			X			X	
Waste disposal charges	X	X	X	X	X	X		X	X		X			X			X	
Hazardous waste charges	X	X	X	X	X	X		X			X			X			X	
Land fill tax or charge										X				X				X
Totals	10	12	22	19	12	12	4	9	6	7	11	3	16	22	11	8	20	8

A: Austria; B: Belgium; D: Denmark; Fi: Finland; Fr: France; Ge: Germany; Gr: Greece; Ic: Iceland; Ir: Ireland; It: Italy; Li: Liechtenstein; Lu: Luxembourg; Ne: The Netherlands; No: Norway; P: Portugal; Sp: Spain; Sw: Sweden; U: United Kingdom

CURRICULUM VITAE

Sander Boot was born in 1974 in Mutolere, Uganda. He graduated from high school in Steenwijk, The Netherlands, in 1992. In the same year, he started his academic career at Wageningen University and Research centre in 1992, where he studied Environmental sciences, specialising in environmental policy and public governance. He graduated in 1999 on a thesis about waste flows from the tapioca starch industry in Vietnam and technical, organisational and institutional measures for reducing their environmental impact. After his graduation, he worked as a scientific research assistant at the department of Environmental sociology at the same university. In 2000, he started his PhD-research at the Erasmus centre for Sustainability and Management (ESM) of Erasmus University Rotterdam, The Netherlands. His dissertation, 'Economic policy instruments and evaluation methods in Dutch water management', discusses the degree to which economic policy instruments and evaluation methods contribute to the general goal of integrated water management. He earned his PhD-degree in 2007. Besides his PhD-thesis, he has published a number of articles and professional reports about water management. Since 2004, he has worked as a specialist in water policy and public governance at consultancies Van Droffelaar & Sträter in Arnhem and DHV B.V. in Eindhoven and Amersfoort, The Netherlands.

