

# RePub Cover Page

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RePub handle: <http://hdl.handle.net/1765/1832> holds various files of the EUR dissertation by J.A. van Ast [1]

## References

- [1] J.A. van Ast. *Interactief watermanagement in grensoverschrijdende riviersystemen*. Utrecht, Eburon, 2000. Bijlage 6 – Summary.

## **Bijlage VI Summary**

### Introduction and aim of the study

The scarcity of fresh water will be one of the major problems for future mankind. The amount of usable fresh water is limited and relatively low when compared to the growing consumption as a result of increasing population, agriculture and industry. Nevertheless, the scarce resources are heavily misused.

The background of this study can be found in the necessity to optimally manage the scarce fresh water resources of the world. As the water cycle is spread over the whole of our planet, a worldwide water management would theoretically be the ideal. The grade of complexity however is - at least at present- too high to bring into practice. But what certainly can be realised is working within the boundaries of water systems. A water system is a water related constellation of physical, chemical and biological factors that together maintain an ecosystem. The highest level of water systems are river systems.

This research aims at determining the optimal way to manage these river systems in a sustainable way. Therefore, it is necessary to find the factors that positively or negatively influence the succes of water management on the level of riversystems. In case of transboundary watersystems, this means that an international approach must be taken.

Information has been gathered from different places in the world and in detail from the River Rhine, the boundary waters of the USA with Canada and with Mexico and from the southern African River Orange. In the end recommendations can be made for the management of the French-Belgian-Dutch river Scheldt (de Schelde).

## Research plan

From the  
perspective of  
"milieukunde"

(interdisciplinary environmental sciences) an analytical model has been applied to describe the relevant surroundings of water management. Partly based on this description, the following policy instrument model has been deduced.

*Figure 1; heuristic model for water management*

## Modernisation

When we look at the modernisation process of our society, we see some major changes taking place. The most eye-catching are globalisation, internationalisation and regionalisation. It is obvious that the disappearance of national borders is part of the current modernisation process. The interactive water management concept suits perfectly to this, but we can see other trends as well. For example, the "economisation" of decision making. Nowadays, everything has a price and for every decision the financial profit seems to be the most important factor. Since common economic thinking does not concern long term effects and non-financial consequences, most environmental factors are not adequately taken into account. Furthermore, there is a tendency that can be called the "horizontalisation of governance". It means that the command and control paradigm that allows the government agencies to determine from

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an hierarchical position what citizens should do, is no longer the most popular. In modern society, citizens participate in the decision-making process in a more or less horizontal position compared to agencies.

These trends have impact on the ideas of how to manage waters. The question now is, how these trends influence the institutional arrangements of the water management. An analysis of the factors that play a role in watersystems gives good insight in the conditions for an effective and efficient management.

## Development of the concept of water management

In the Dutch history of water management five different stages can be distinguished. In every new historical phase, new policy objects are added to the ones that were in the spotlight in the phase before (see figure 1).



sectoral approach reached its limits. It is just not possible to fulfill all the demands of every different sector at the same time.

It became necessary to make decisions at a higher level: the watersystem as a whole. This integrated water management, the fourth stage, began in The Netherlands around the mid eighties with the policy document "Dealing with water". Not the demands of the different stakeholders, but the ability of the total water system to supply all these sectors became the starting point. This holistic approach came up at more places in the world and nowadays everywhere people are working on the implementation of the ideas of integrated water management.

But, as can be expected, the evolution in the concept of water management did not end here. A fifth stage is about to follow. It can be characterized as "interactive water management", and again the development is directed to more complexity.

## Interactive water management

Presently the water system is still the central theme in water management. It remains valid in the same way safety and the supply to water sectors do. In interactive water management however, water policy agencies are in a continuous interactive dialogue, both with the watersystem and the society system. The interactive approach of the water manager is the main difference with the preceding stages.

An interactive approach is more than a way of thinking. It is an attitude, a way of treating the environment. Not only respecting the natural environment, but also having an open mind for the social environment. It is based on the fact that man is in a mutual relationship with his surroundings. The interactive view can be found in two different relations:

1. interaction between the water manager on the one side and the factors of the total water system on the other side;
2. interaction between the water manager and the different actors in society.

Firstly, interaction between water managers and the water system. This can also be called the ecological or the adaptive environmental management approach. Government adapts its policy to the processes in ecosystems, while the water manager tries to follow, at every point in time, the most recent developments in the ecological system. This view results from the awareness that every water management starts with the water system itself. While for every decision and for every management, reliable data are necessary, a very important condition for succesful water management is the monitoring of indicators of what is going on in the natural systems. In the earlier phases, these data were gathered only at the moment a decision had to be made, so nothing happened until the moment the information was really needed. Every time a new problem arose, a new data campaign had to be started.

### ***summary***

In the interactive approach however, water managers continuously gather data of many different physical, chemical and biological (system) parameters, so they follow the developments in the water system. The results are put into (preferably GIS-based) models, that consider all kinds of relations. The models are updated periodically, according to the latest evaluations. Therefore, at every point in time an overview of the state of the art can be made. Although this kind of interaction with the water system fits very well with the integrated approach, it has never received significant attention.

The same can be said about the interaction between the water manager and society, although the changes in this field are perhaps even larger. Compared to the traditional approach, the influence of citizens on decision making differs considerably. In interactive water management, the public can participate actively in the decision making process. The relationship between government and other societal actors is much more horizontal and all main planning procedures are open to all stakeholders. Not only will they be heard, they are invited to think together with the government agencies about the best solutions. In the meantime, the first experiences with this kind of interactive planning in the Netherlands have been realised.

The "open planning process" has also been used for the interactive development of the latest long term policy document of the Dutch central government. All citizens are invited to think, together with the government, about new developments in water management. A few hundred specialists were even interviewed individually by government agencies about their opinions concerning goals and means for coming years.

Unfortunately, this government document has the geographic area of the Netherlands as a starting point, which is not the most suitable level for the management of Dutch water systems. Both water quality and water quantity are dependent on upstream countries. It would have been better to choose for a centralised type of strategic, long term policy for the entire water systems of which the Netherlands are a part. These systems consist of the river basins of the Rhine, the Meuse, the Scheldt and the Eems. The idea of centralisation of policy at the level of the total river is part of the river basin concept. This concept is stressed in many international publications, for example in Dublic Declaration of 1992. In recent years most international agreements have adopted the river basin as the most suitable unit of water policy. According to the Rio-Declaration of 1992, the ECE-convention of Helsinki of 1992, the convention on non-navigational uses of transboundary watercourses of the UN of 1997 and the draft framework directive on water policy for the European Union of 1999, at least coordination is required at the basin level.

If we translate this approach to practical use, than an open interactive planning procedure should concern a complete river basin. For example, all inhabitants of the river Rhine basin would have the opportunity to participate in the long

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term developments of the whole river. The total plan contains the main contours for the river basin, from the mountains in the Alps to the place where it flows into the North Sea. Operationalisation would take place by sub agencies, according to the main lines in the overall water system plan.

In fact, the International Rhine Commission already does some non binding planning for a large part of the river (from the Untersee to Rotterdam). However, this always concerns sectors like water quantity, ecology, migrating fish, and certain polluting substances. Hydrology and navigation even fall under other commissions.

## Institutional arrangements

The latest concept of interactive water management consists of four basic components; the water system approach as a starting point, the river basin concept as a policy object, interactive management and sustainable development. Combining these with the mentioned trends of modernisation, provides a good view of the institutional outlines of future water management.

As far as the interaction with society is concerned, it seems that the first elements of interactive water management already come into practice in the transboundary water management in Northern America and Western Europe. Most other elements, however, cannot be found in practice, so the road to interactive water management on an international level is still long. In any case it would be helpful to note in advance which steps are probably on the way.

As a possible trajectory, table 1 shows three main steps. The first step is focused on intensive co-operation between water managers of the different countries. The most innovative river basin commissions are in this phase or make preparations to be there. The second step, which until now has not been made, focuses on integration of all elements of water management between the different countries. There is also interaction between international water managers and the river system as well as between managers and society. The third step contains the situation of supra-national watermanagement of the complete river basin in the far future.

INTEREST	TASKS FOR THE CENTRAL ORGANISATION	
<b>primary</b> coordination	<b>Organisation</b>	1. international organisation for the coordination of the water management in the international river system
		2. coordination technical installations
		3. coordination information in situations of alarm
		4. negotiating role in international conflicts
	<b>Policy</b>	5. coordination strategical policy plan for the river basin
		6. hearing of interest groups
		7. ad hoc evaluation of policy implementation
	<b>Means</b>	8. disposal of own household budget
	<b>Governance</b>	9. provision of public information and data
		10. coordination of research
		11. coordination measuring of qualitative and quantitative parameters
<b>secondary</b> co-operation	<b>Organisation</b>	1. international organisation for co-operation with water managers in the international system
		2. technical operational control
		3. coordination of institutions in situations of crisis
		4. preset procedure for international conflicts
	<b>Policy</b>	5. management plan for the whole water system, with binding regulation for water management on the level of sub basins
		6. participation stakeholders in an open planning procedure
		7. continuous check of policy implementation
	<b>Means</b>	8. own budget for research and operational activities
	<b>Governance</b>	9. interactive exchange of information with actors in society
		10. own research and training
		11. similarity in monitoring of system parameters (physical, chemical and biological)
<b>tertiary</b> supra-national interactive water management	<b>Organisation</b>	1-3. international organisation with strategical competences and operational responsibilities in the international river system
		4. binding decisions by court for decisions in conflict situations
	<b>Policy</b>	5. power of enforcement of plans and decisions in the whole river basin
6-7. interactive planning, decision making and policy evaluation		

<b>Means</b>	8. own budget from own sources
<b>Governance</b>	9-11. interactive relations with society and water system

*Table 1; phased implementation of interactive water management by a central river basin organisation.*

In all three phases, the integration of all organisations with sector responsibilities in one commission is a condition for a well-balanced water management. This organisation should play a role in the whole water system, including aspects of land use as long as they are essential for the management of water systems.

Nowadays, the Rhine countries together with NGOs are heading for a comprehensive river system plan that integrates most of the functions the Rhine system offers. Nevertheless, even in the Rhine area, with more and more interdependent economies, the development of a supra-national water commission will probably not be reached within a short time. But the step towards co-operation on the level of the water system, centralised in one international commission, can certainly be realised in the near future. Ultimately, it can lead to international commissions that have competences enabling them to manage water systems shared by more than one political entity. In my view, this is the only way to keep the road open to the sustainable development of transboundary water systems.

As long as political considerations like sovereignty have decisive influences on water management, international institutions can only be developed in an incremental way. The evolution can take place in three main steps: first co-ordination, than co-operation and later supra-national river basin management. It appears that the situation of international water management by a central supra-national organisation is politically not within reach. Above that, the advantages are questionable. Therefore, the second phase of interactive water management should be the goal for the coming years.

## Interactive water management of the river Scheldt

The secondary phase can be recommended to the international river system of the River Scheldt, shared by France, Belgium and the Netherlands. Important steps are:

- mutual communication with the public on an internet site;
- organisation of public meetings and workshops on special issues;
- involvement of NGOs in the decision making process;
- using instruments that aim at self-regulation and network management;
- arrangement of social contacts between officials from all countries;
- participation of water managers in activities of colleagues in other countries.

### **summary**

The core of the new institutional arrangements is sustainable development of the river system, by an international organisation such as the international Commission for the protection of the River scheldt, that governs in a mutual relationship with society and water system.

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