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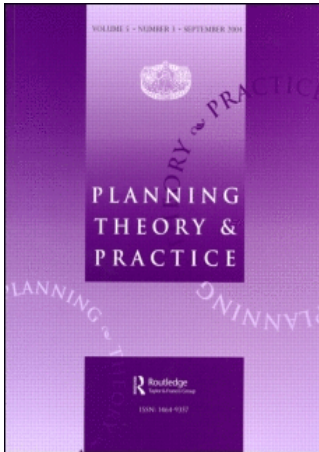
On: 5 July 2007

Access Details: [subscription number 780391673]

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954

Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Planning Theory & Practice

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713624517>

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Online Publication Date: 01 June 2007

To cite this Article: Van Gils, Marcel and Klijn, Erik-Hans , (2007) 'Complexity in Decision Making: The Case of the Rotterdam Harbour Expansion. Connecting Decisions, Arenas and Actors in Spatial Decision Making', Planning Theory & Practice, 8:2, 139 - 159

To link to this article: DOI: 10.1080/14649350701324359

URL: <http://dx.doi.org/10.1080/14649350701324359>

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Complexity in Decision Making: The Case of the Rotterdam Harbour Expansion. Connecting Decisions, Arenas and Actors in Spatial Decision Making

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ABSTRACT *Decision making about spatial projects is very complex. Decisions to develop the Rotterdam harbour are taken in the context of a network of local, regional, national, European and international actors, both public and private. These decision-making processes exhibit a lot of complexity and the outcomes are of great importance for the development of the harbour. The complexity is the consequence of interactions between actors connected in different arenas, who are all thinking about the same project. This article uses network theory, and the concepts of actors and arenas in particular, to highlight the complexity of decisions and the connections between various separate decisions. It is demonstrated that the outcomes of the decision-making process are a result of the various connections that are being made. The spatial project at the core of this article is a harbour expansion project called Maasvlakte II.*

Keywords: Decision making; network management; harbour expansion; complexity

Introduction

Decision making in the modern network society is complex. Decision processes take place in networks of actors, who are tied by interdependencies in a society where resources and knowledge are spread among a variety of actors (Castells, 1996; Healey, 2006; Kickert *et al.*, 1997). In addition, societal groups increasingly try to get involved in decision making, which in turn makes the decision-making process even more complex. The history of the expansion of Rotterdam harbour, (through the creation of the Maasvlakte II), illustrates this complexity. It becomes apparent that in order to achieve satisfactory outcomes, it is crucial to manage complexity in terms of actors, values and interactions

Twelve years have passed since the initiation of the decision-making process to expand the Rotterdam harbour (1993). Until now we have witnessed a very complicated process with many actors involved. Despite this, the main actors evaluated the decision-making process as satisfactory. At the end of 2004, the atmosphere suddenly changed. The Council

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of State (Raad van State) rejected the project proposals because they believed research about ecological aspects was lacking. The documents required for the juridical procedures to implement the proposals (the so-called zoning procedure) that were almost ready have since been adapted and updated. It is expected that it will take an additional one and a half years to execute the restarted zoning-procedure.

This article uses a network perspective to analyse the complexity in the decision-making process (see Koppenjan & Klijn, 2004). It analyses the nature of the complexity, focusing on different actors and arenas involved in the decision-making process, and the way various connections were made during its different rounds. In order to do this, the article describes two separate rounds in the “game” to expand the harbour and compares them with each other. The following question is asked: “How can we analyse complexity from a network perspective and how can it aid us in explaining the outcomes of the decision-making process to expand the Rotterdam harbour?”

The next section introduces the case for the expansion of Rotterdam harbour. The following section outlines the theoretical perspective and introduces the concepts of policy network, game, decisions and arenas. With these concepts, the article analyses the decision-making process in the two most important decision-making rounds in the next two sections. The analysis focuses on the intertwinement of different decisions, arenas and networks. It is also demonstrated how decision making becomes dynamic through the connection and disconnection of various decisions and arenas. It is shown how the decision-making proceeds and stagnates because of different connections and the way that these connections are being managed. The article concludes with some suggestions for how to manage complexity in decision making.

Expanding the Port of Rotterdam: The Case

The harbour of Rotterdam is one of the main cargo junctions in the world. The central location in Europe and the open access to the North Sea makes the harbour highly accessible for all parts of the world. Approximately 450 million people live in the hinterland of the port and the hinterland is now reaching towards the fast growing economies of Central and Eastern Europe. Each year 30 000 sea-going vessels and 130 000 barges call at the harbour.

The Growth of Rotterdam Harbour

The harbour is situated in the southwest of the Netherlands and covers an area of 40 km (10 500 hectares) from the city centre to the Maasvlakte 1 along the Nieuwe Waterweg canal.

From the end of the 1960s until some years ago the harbour was the biggest in the world. Today the harbours of Singapore and Shanghai have higher throughput volumes. This does not mean that the harbour has not been growing in recent years. Indeed, growth has led to an increased demand for land for port activities. In addition to the demand, a second interrelated factor can be observed. The main competitors of the Rotterdam harbour are the other harbours in the North Western part of Europe: Antwerp and Hamburg. Both ports have higher growth rates (from 1985–2005) than Rotterdam harbour, which has increased pressure for Rotterdam to expand.

The growth of the harbour, the expected growth for the next decades, together with the competitive pressure to grow, led to a strong demand for a new port expansion. From the 1960s onwards the port steadily expanded westward (from the city centre to the North Sea), with Maasvlakte 1 as the latest addition. The shaded part in the left side



Figure 1. The harbour of Rotterdam. Source: Port of Rotterdam Authority.

of Figure 1 identifies the plan for the Maasvlakte II. The decision-making process for this port expansion plan is the object of study in this article.

In 1993, The Port Authority of Rotterdam (at that time a municipal organisation) and the Dutch Ministry of Public Works, Transport and Water Management, introduced the spatial project in the port plan 2010. It was embedded in the project of the ROM-Rijnmond agreement.¹ The actors involved introduced several alternatives:

- (1) The Maasvlakte II: a new expansion of the harbour
- (2) Optimising space in the existing harbour areas
- (3) Harbour expansion in other port areas in the south-western part of the Netherlands (for example, Vlissingen and Moerdijk).

The actors decided to create a project organisation to co-ordinate the decision-making process. The Port Authority and the provincial part of the Ministry of Public Works, Transport and Water Management co-ordinated this project organisation. One of the first recommendations of the project organisation was to shift the lead to the Ministry. The reasons given were that the project was of national interest, while the Port Authority and provincial department could not generate sufficient financial means for realisation (Weggeman, 2003).

With this decision the first of four rounds in the decision-making process came to an end. The analysis in this article focuses on the second round (the interactive phase that took place from 1996 until the end of 1997) and the third round (from 1998 to mid-2001). The fourth round with the decision of the Council of State is described as a postscript towards the end of the analysis.

A Network Perspective on Complexity

The network perspective assumes that policy is developed and implemented in networks of organisations (Kickert *et al.*, 1997). These policy networks can be defined as “more or less stable patterns of social relations between mutually dependent actors, which form around policy problems and/or clusters of means and which are formed, maintained and changes through series of games” (Koppenjan & Klijn, 2004, pp. 69–70). It could also be said that these networks are complex systems of organisations.

Networks come into being and remain in existence because actors are dependent on each other (Aldrich, 1979; Innes & Booher, 2004). Actors cannot achieve their objectives

without resources, and these are divided amongst many actors. Networks are thus characterised by a limited substitutability of resources, which ensures that sustainable social relations between actors are created (Koppenjan & Klijn, 2004). Thus power in a network perspective is first connected to the resource division and asymmetry of the dependency relations. Actors with more resources and with resources that are not substitutable have more power (Koppenjan & Klijn, 2004; Scharpf, 1997).²

For a good understanding of a case such as the Maasvlakte II it is essential to note that interactions around the decisions do not only take place within networks of organisations, but that separate decisions are often situated in separate arenas. These arenas can be situated in one network, but sometimes more arenas in different networks are involved, thus enhancing complexity considerably. Complex environmental decisions, in particular, are often characterised by a variety of (sector) decisions which most of the time are being taken in different networks. The theoretical perspective and the notion of complexity in policy interactions are elaborated below.

Arenas and Games: The Setting for Interaction

The game of problem solving in the decision-making process on Maasvlakte II takes place in and between arenas.³ The actors present their strategies in one or more arenas. The arena is the place or field where actors meet and interact. It is the place where a specific group of actors make choices on the basis of their perceptions of problems and solutions (Cohen *et al.*, 1972). The evolution and outcomes of decision-making processes in policy networks are determined to a large degree by the mix of strategies brought into the arena and the interactions between arenas. An arena consists of a set of actors, a choice situation and some more or less well-designed organisational arrangements (Koppenjan & Klijn, 2004).

Complexity: Strategic Actions of Players in Multiple Arenas

Policy games are complex not only because there are many players making unpredictable strategic choices, but also because they are (often simultaneously) involved in more than one arena. This is because most problems have different dimensions and thus touch upon different types of policies and actors. For example, in decision making on harbour expansion, issues such as transport, economy, employment, planning, noise and safety, play a role. As a consequence, decisions about the future of the harbour are made in the context of various types of policies, in various arenas, and at various government levels. As a result, the policy game acquires a highly fragmented character with decisions being made in different arenas at different levels and times.

More Complexity: The Relation to Other Games and Networks

The complexity of policy games is also enhanced because games are not played in a vacuum, but amidst other games. Within an arena, actors can play more than one game. As a consequence these games influence one another. A loss in one game can be compensated by a gain in the other, or vice-versa. Different arenas play games to try to couple their internal problem solving with problem-solving processes in other arenas. Policy games thus influence each other. Through couplings, new trade-offs can be realised between games. As a consequence, it is conceivable that in the one game support for unpopular measures is created because there is compensation in another game. Furthermore, coupling of games may have a mitigating effect upon the conflicts and strategies that actors use. The costs for strategic misbehaviour in one game will have

to be paid in another (Allison, 1971). Policy games will be even more complicated if they occur in arenas that are situated in different networks.

It is not only difficult to connect the various interactions, but it is also likely that different networks are characterised by different rules. This means that different rules are used in arenas that are composed of actors and interaction activated from different networks. This again increases the complexity of the game.

Outcomes of Policy Games: The Result of many Interactions

The evolution of policy games is a linear process where a problem is solved on the basis of authoritative *ex ante* problem formulations or objectives. Policy games develop through a series of successive decisions about the nature and content of a problem, about solutions, and about how these matters are being decided. Just as there is no central decision maker, there is no central decision. The policy game looks more like a simultaneously played multiple chess game played in a number of rounds (Radford, 1977; Teisman, 1992). A round opens with an initiative or policy intention of one of the parties that serves as “trigger” to the others. What follows is a discussion between actors about what is to be done, what the problem is and how this can be organised in a context that is often characterised by a lot of ambiguity (March & Olsen, 1976). Through a series of steps, parties will then search for mutual adaptation or joint solutions, not so much because they like each other but more because they are forced to do this through their mutual dependencies.

Impasses and Breakthroughs

This process is certainly not without problems. Impasses can block achieving satisfactory solutions for all parties. Impasses may emerge because actors are unwilling to invest in the process (stagnation) or because there is a conflict where some actors use their veto power (blockage). Impasses may eventually lead to terminating the policy discussion, but can also result in a breakthrough. Breakthroughs and impasses can come about by crucial decisions that reformulate the problem, conciliate opposing solutions or change the group of those involved. Each round ends with a “crucial decision”, a decision that offers a solution for the question that is central in the particular policy round. Crucial decisions can be recognised because they frequently change the number of players, the nature of the interactions or the content of the game (and mostly more than one of these). The content of such a solution does not have to be the solution of a previous formulated problem. It can also mean a redefinition of the original problem or a transposition of earlier positions and objectives, so that the scope for solution is changed or enlarged. A crucial decision heralds a new round or leads to a restart of earlier rounds. Thus, a “whole new ball game” emerges with stakes, perceptions and strategies. Figure 2 visualises a policy game through different rounds. The vertical axis provides the development of the content of plans, the horizontal axis the development over time. The direction of the arrows indicates the degree to which the process zigzags (substantively) and evolves by fits and starts (in terms of time). The total policy game is composed of different games between actors in the arena, between the arenas and between the rounds. Impasses and breakthroughs can occur in all these games and sub-games.

Complexity and Explanations for Policy Processes

From a network perspective complexity is an inherent character of problem-solving and decision-making processes. Complexity is the result of:

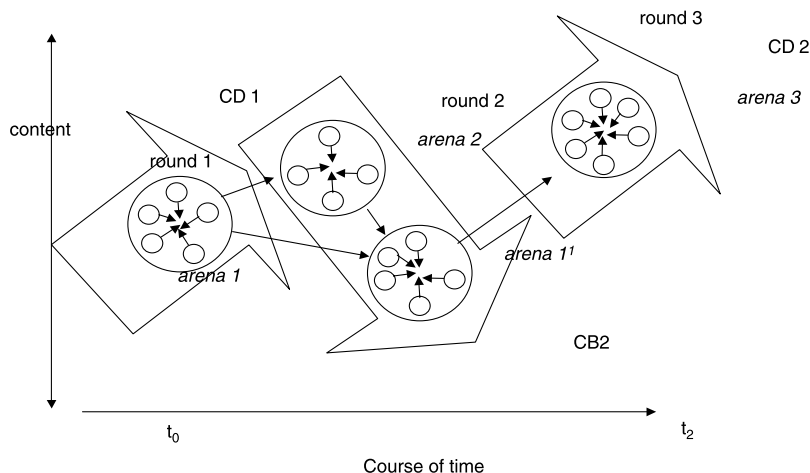


Figure 2. Flow of policy games: problem solving as a zigzag and erratic process. Source: Adapted from Klijn et al. (2000)

- Various actors with different perceptions who each act strategically (and thus cannot be predicted accurately, although knowledge of their position and perceptions gives some idea of the range of their strategies).
- The interactions of different strategies of different actors within arenas.
- The interactions of various decisions made in different arenas within a policy round.
- The interactions of various decisions made in different arenas between policy rounds.
- The fact that interactions may occur in different arenas, which belong to different networks, creates the possibility that different rules will be used and taken for granted by involved actors.

Network theory provides a variety of explanations for reaching successful outcomes. Some of these explanations can also be found in planning theory. They appear when the focus is upon creating institutional or governance capacity in complex decision making (Healey, 1998, 2006; Innes & Booher, 2003; Koppenjan & Klijn 2004). The most important explanations are:

- Positions of actors and their resource dependencies;
- Achieving interesting solutions that satisfy the various values at stake;
- Coupling of interactions of actors and arenas;
- Shared institutional structures (such as network rules);
- Systematic management efforts.

This article focuses specifically on three explanations for the success of outcomes in decision making:

- The actor dynamics and positions;
- The activated arenas and flow of the decision-making process;
- The achieved couplings and managerial activities.

“Successful outcomes” refer to outcomes that:

- Generate support among many involved actors and of which actors are satisfied;
- Outcomes that are clearly developed in terms of content (this can be judged from the fact that new ideas have been developed, by the fact that plans meet earlier criticism);

- Outcomes which have been realised through open processes where costs are not transferred to other actors or networks.

Methodology

The reconstruction of the decision-making process of the extension of Rotterdam Port was based on longitudinal research conducted over the years by various researchers within the same research group at Erasmus University. Klijn studied the VERM extensively by means of both participant observation and documents and interviews.⁴ The PMR decision making was studied by Weggeman (Weggeman, 2003)⁵ and based on a detailed document analysis and interviews of all the important stakeholders. For the reconstruction of the last period, Van Gils made additional interviews.

The VERM-Round (1997–1998): Actors, Arenas and Interactions

In April 1996 the Cabinet decided to shift the responsibility for the project (Maasvlakte II) to the Ministry of Public Works, Transport and Water Management. The first action undertaken by the new ministerial project organisation was to start the VERM (Exploration of the Spatial Need for Mainport Rotterdam). The VERM was meant to discuss the necessity and urgency for the expansion of the harbour area. The crucial decision marking the end of the round was to start the formal preparation of the zoning-procedure.⁶

At first a project team was created for the organisation of the interactive decision-making process or open-plan process. This project organisation consisted of civil servants from four departments (Public Works, Economic Affairs; Agriculture, Public Housing and Zoning). In addition to the project team, various actors can be distinguished in the open plan process (De Vries, 1997; Videler, 1997). The main actors involved in the round are presented in Table 1.

Given the participation of various actors and the organisation of the process, it can be concluded that there were two different games. On the one hand, there was the policy game around the open plan process. This involved various actors interacting about the question of whether there was lack of space in the Rotterdam harbour and how that could be solved. It was conducted in three closely related arenas and a loosely linked arena: a discussion arena with workshops and panels which were very open for all actors (especially individual citizens); an expert arena parallel to the first and dominated by expert meetings and research; and a condition arena where the conditions of the process organisation and participation were discussed. The project team dominated the first two arenas, which as network manager, linked decisions and arenas. The third, more loosely linked arena was more a regular contact between project team and departments in which national interest groups also participated. In these three arenas almost all of the actual interaction between the various actors took place. For that reason they are called the central arenas.⁷

In addition to the arenas in which the first game took place, there were two other important arenas. First, there was the departmental arena, the initial decision arena, in which the results of the VERM discussion were transformed into an initial decision (the Cabinet decision was prepared in this arena before it went to parliament). The Department of Public Works, Transport and Water Management was the most important actor in this arena, but actors from other departments were also involved. Second, there was a political arena for the political decision about the subsequent course of action. The parliament and the ministers played a prominent role with the departments in the background (see Table 2 for the most important arenas). In these two peripheral

Table 1. Actors in the VERM round

Actors	Characterisation	Moments of participation
Citizens	Individual citizens	Especially in the workshops and the round table meetings
Interest groups (economic)	Nationally organised economic interest groups (labour unions, employers organisations, Association of Dutch chemical industry)	Especially in sounding board group, also in national presentation, the workshops
Interest groups (environmental)	National and regional environmental groups (Society for Nature and Environment, World Nature Fund etc.)	Especially in sounding board group. Modest participation in workshops, round table groups
Regional administrators	Mayors/Aldermen of municipalities and counties involved; representatives and directors of harbour companies	Dominant in consultant discussion, amply represented in round table meetings, more modest in workshops
Experts/researchers	Scholars/researchers with expertise in relevant fields (regional economics, public administration environment)	Especially in expert meetings. Less intensive in sounding board groups, workshops
National administrators	Ministers	Minimal involvement
Departments (units and people not in VERM)	Public Housing and Zoning; Public Works, Transport and Water Management, Finance; Economic Affairs	Minimal involvement, but active in interactions around VERM
Parliament	Political parties	Very limited participation

Source: Adapted from Klijn (2003).

arenas the interactions took place after the VERM (Exploration Spatial Need for Mainport Rotterdam) process had been finished. It can be seen that the departments (especially Transport and Water management) held strong positions because they were both present in the project organisation VERM and dominated the arenas in which further decisions were taken and prepared, following from the interactive procedure. They also had strong indispensable resources (authority and access to decision channels).

Interactions in and Between Central Arenas

There were varying degrees of intensity in interactions in and between the arenas. The interactions in the condition arena can be considered as a meta-game for the actual interactive process. At the beginning (mid-1997) it appeared that there was limited support from the civil service for the open plan process. The Maasvlakte II project team continued to co-exist with the VERM project team, and civil servants from various departments continued to work on the development of the Maasvlakte II. This meant that while they continued to work on one solution for the shortage of space in Rotterdam, they were also discussing the nature and urgency of that problem and alternative solutions.

Some civil servants even questioned the open plan process that involved "so many citizens". They preferred a larger role for interest groups during the discussion. At a meeting with the top civil servants of the Ministry of Public Works, Transport and Water Management in September 1997, the question of whether the real problems had emerged was explicitly raised. "Societal talk is not yet societal support" was the argument. It was also made clear that the minister and members of parliament could not join in the

Table 2. Arenas in VERM

Arena	Central actors	Organisation and linkages of interactions in arena	Task/activities
<i>Central arenas</i>			
1. Discussion arena	Citizens, regional politicians, regional interest groups (economic and environmental)	Organisation: through round table meetings, workshops and sounding board groups Linkages: by project group VERM	Discussion about nature of problem, types of solutions, interests etc.
2. Expert arena	Scholars, national interest groups, CPB, Port Authority	Organisation: expert meetings, sounding board groups and research (CPB) Linkages: by project group VERM	Reflection on process and substance, development of solutions
3. Condition arena	Project group VERM, departments, monitoring committee and (sometimes) national environmental organisations	Organisation: loosely coupled Linkages: mostly initiative of project group	Discussion about VERM design, about types of product, about participation
<i>Peripheral arenas</i>			
4. Initial decision arena	Departments (Environment, Economic Affairs, Agriculture and Fisheries and Public Works, Transport and Water Management), project group VERM	Organisation: usual interdepartmental co-ordination mechanism Linkages: through Public Works, Transport and Water Management	Preparing initial decision for Cabinet and parliament (both substantively and procedurally)
5. Political arena	Second chamber, Cabinet, departments	Organisation: usual formal procedures	Political decision and its preparation (by Cabinet)

Source: Adapted from Klijn (2003).

discussion because, it was argued, they had their own responsibilities. This meant that the project decision might differ from the outcome of the discussion. Thus the top civil servants of the ministry maintained the right to determine the project decision. They refused to be bound by decisions in the interactive arenas in any way. This point of view was repeated in subsequent discussions between the project team and the top civil servants of various ministries. The open entry rules in the interaction arena conflicted with the closed nature of the arenas outside the discussion. Formally the interaction arenas were not a threat to the position and authority rules of ministries and politicians because in the interactive arenas no final decisions could be made. The results of the interactions in these arenas had only the status of advice and information. However, in practice they were

a threat because it is not easy for politicians and civil servants to neglect the results of the interactive phases in which much time and energy has been invested. Indeed, politicians and civil servants stress their own responsibilities at the beginning of the process precisely because they seek to take away this pressure and modify expectations.

The environmental organisations were discontented with the design of the discussions in the workshops and the round table meetings. They withdrew because they felt that the real discussion about shortage of space had not taken place. Furthermore, they would have liked the Environmental Impact Assessment (EIA) Committee to be involved to ensure the substantive monitoring of the environmental objectives and the support for them. Both the ministers of Traffic and Water Management and the monitoring commission had signalled to the VERM project team that it was important for the environmental organisations to stay involved. A meeting resulted in the decision to ask the EIA Committee for advice and the formation of an extra sounding board group. The environmental organisations were to have the opportunity to comment on the structural policy of the Cabinet (strengthening the mainports of Rotterdam and Schiphol).

Toward the Crucial Decision: Interactions Outside the Central Arenas

On the basis of the findings from the open plan process, the project team advised the Cabinet to construct a smaller Maasvlakte than initially proposed by the project group for Maasvlakte II. For the time being, the Maasvlakte II should be about 500 ha “dry area” (that is without harbour facilities) or 1000 ha with a direct link to water. A new nature area of approximately 750 ha should also be developed. It can be observed that discussion on shortage of space was already replaced by a discussion on the alternatives or even one of the alternatives (Maasvlakte II kept dominating). The project group concluded that smart “expansion solutions” were almost as expensive as the construction of a new area of some 2000 ha. This made the choice for a new area that respected nature values more obvious. After the discussion in the open plan process, the preparation for the project decision was returned to the departments. The final project decision conveyed the Cabinet’s point of view that an economic growth of 3 per cent was necessary. This was to guarantee the goals of sufficient growth of employment, and a well functioning Rotterdam port. According to the Cabinet, research supported the idea that there was a lack of space for the mainport. It proposed the initiation of a zoning procedure that would focus on land creation of about 1000 ha of contiguous harbour and industry area with its own access to the sea. The possibility for the alternative of 500 ha dry area would also have to be investigated, and future expansion should be possible. Furthermore, this procedure was to investigate how the 750 ha of nature and recreation area could be realised. Striking resemblances can be noted when the decision prepared by the Ministry of Transport is compared to the original ideas of expansion (at the start of the interactive process). It can be deduced that the new ideas and discussions that had been brought in by groups in the interactive phase did not have much effect. There was also little reference made to the ideas in the interactive process. In this respect the effects of the whole VERM interactive procedure were disappointing (Klijn, 2003).

In December 1997, parliament discussed the proposal to initiate the zoning procedure. The discussion was dominated by the question of whether there was enough material to start this procedure. The minister assumed that expansion was necessary, but allowed for the possibility that the zoning procedure could show otherwise. After discussion, all motions to delay the zoning procedure were rejected. Only one motion of the Social Democratic party, the PvdA (Social Democrats), was accepted. This motion indicated that

the objectives of developing the mainport and improving liveability were equal, and that the various alternatives with respect to such issues (i.e. required acreage, the balance between private and public investments, the transport and environmental actions, and the nature conservation area) were to be worked out simultaneously. The Cabinet parties of D'66 (Liberal Democrats) and PvdA (Social Democrats) supported the motion primarily because of their concern about the environmental component in the decision making. The Cabinet party VVD (Conservative Liberals) supported the motion because it did not want to be surprised by alternatives at a later stage, as had happened with a high speed train decision. The decision to start the zoning procedure was the crucial decision that marked the end of the VERM round.

The PMR Round (1998–2001): Actors, Arenas and Interactions

On the 14 July (1997), the Project Mainport Rotterdam was started. PMR was assigned two main tasks, to research the alternatives for expansion and research, and describe the influences on the quality of the surrounding living environment. PMR was organised by the different governmental layers, together with the following public organisations: the ministries of Public Works; Spatial Planning and Environment; Economic Affairs; Agriculture, Natural Resources and Fisheries; and Finance. The province of South-Holland, municipality of Rotterdam and the city-region of Rotterdam were also incorporated in the project organisation. This project organisation was responsible for the preparation of the zoning procedure that started at the end of 1997 (December 1997/January 1998).

In addition to all these public actors, many others were participating in this part of the policy game (see Table 3). Societal groups, firms and intermediaries participated in the Consultation Non-Public Actors (ONR).⁸ Some representatives of the PMR joined the ONR regularly to relate the discussion made in the ONR to the public arena. This public arena was called BOM⁹ (Public Consultation Mainports). The PMR project organisation actors were mostly represented in the BOM. The BOM focused on public consultation whereas the PMR was meant to co-ordinate between the arenas. In other words, the PMR was the framework in which the interactions between the different arenas were structured. This is why this round has been called the PM round. This does not mean that the PMR project organisation stopped when this round ended.

The BOM (Public Consultation Mainports) and ONR (Consultation Non-Public Actors) were the most central arenas in the PMR. Both arenas were connected by the organisational arrangement called the Top Council¹⁰ (Top Beraad). The Vision and Heart group also influenced the ONR and is described as an arena in which some actors were actively participating. This short introduction is meant to clarify the different terms that will be used in Table 3.

These actors functioned in five different arenas playing in two distinct games. On the one hand there was the policy game in which the alternatives for harbour expansion were discussed. This was done in two closely related arenas. The ONR-arena was characterised by regular meetings in which the consequences of the different alternatives for expansion were discussed. There was also the BOM arena, composed of the ministries, province and municipality. Although the conditions of the process were discussed here, the focus was also on possible alternatives.

An arena called Vision and Heart (Visie en Durf) developed parallel to the ONR. Three environmental pressure groups worked together with the municipality of Rotterdam to

Table 3. Actors in the PMR round

Actors	Characterisation	Moments of participation
Interest groups (economic)	Nationally organised economic interest groups (labour unions, employers organisations)	Especially in intern co-ordination and partly in the regular sessions of ONR.
Interest groups (environmental)	National and regional environment groups (Society for Nature and Environment, Consept) Representatives of Port Authority	Especially in ONR and partly in Vision and Heart. Discussion about incorporation of environmental values
Regional administrators	Mayors/Aldermen of municipalities and provinces involved; and the association of Water Boards	Especially in Public Consultation Mainports (BOM) and some separately in Vision and Heart
Project co-ordinators	Project organisation PMR and individuals (Hans Alders/Roel in 't Veld)	Active in and between different structures, like in ONR, between ONR and BOM
National administrators	Ministers	Minimal involvement, until latter stages of PMR Round
Mixed interest groups	For example, the Automobile Drivers Association, intermediaries	Incorporated in ONR, representing mixed values.
Departments	Public Housing and Zoning; Public Works, Finance; Economic Affairs	Involvement in Public Consultation Mainports and informing the ministers
Parliament	Political parties (national level)	Very limited participation, in approval of zoning procedure

Source: Adapted from Weggeman (2003).

discuss the environmental compensation measures developed in the port expansion plans. This was a closely coupled arena.

The fourth and the fifth arena were loosely coupled. The fourth arena is called the private-consultation arena. Parallel to the discussion of the alternatives, a group of private firms was consulted to discuss possibilities for Public-Private Partnerships (PPP) for the realisation of the alternatives. It is particularly striking that the discussion about the PPP focused on the realisation of the Maasvlakte II. This indicates the ongoing dominance of this alternative in the discussion.

The fifth was a political arena for the political decision about the subsequent course of action. The parliament and the ministers played a prominent role in the latter stages of this round and afterwards, but were absent in the earlier discussion. The five arenas are indicated in Table 4. It was in and between these arenas that the transformation of the discussion towards a decision took place.

Interactions in and Between the Central Arenas

There are varying degrees of intensity in interaction in and between the arenas. At first the linkages within the ONR-arena were loosely coupled (from 1998 onwards). It was only when the arena obtained a more prominent position (after formalisation in 2000) that the discussions with the public organisations became more inter-connected. The BOM arena was relatively well organised because it was linked very strongly to the actors in the project organisation.

The dichotomy between the economic and environmental stakes was at the heart of the discussion about the open plan process. The environmental groups expressed their

Table 4. Arenas in the PMR round

Arena	Central actors	Organisation and linkages of interactions in arena	Task/activities
<i>Central arenas</i>			
1. ONR (Consultation non-public actors) arena (formalised in 2000)	Interest groups (economic and environmental)	Organisation: through monthly meetings Linkages: by ONR	Discussion about alternatives, representation of interests
2. BOM (Consultation Public Actors) Arena	National, provincial and local public stakeholders	Organisation: through regular meetings Linkages: by BOM	Reflection on process and substance. Discussion on alternatives.
<i>Peripheral arenas</i>			
3. <i>Vision and Heart</i>	Interest Groups (mainly environmental) organized to discuss environmental aspects more prominently than in ONR	Organisation: regular meetings Linkages: via Municipality of Rotterdam	Discussion about how to incorporate environmental aspects in expansion of harbour
4. PPP arena	Firms and Ministry of Public Works, Transport and Water Management	Organisation: some meetings Linkages: by project organisation	Thinking about possibilities for Public-Private Partnerships
5. Political arena	Parliament, Cabinet, departments	Organisation: minister Linkages: BOM/Topberaad	Political decision and preparation (by Cabinet)

Source: Adapted from Weggeman (2003).

feelings of misrepresentation regularly and the tension between economic and environmental interests dominated the decision making. This tension was captured by the formalisation of the ONR at the beginning of 2000. The agreement was quite unique, in the sense that it was the first time environmental interest groups received such a strong position in decision making, and offered the potential for balancing the economic and environmental stakes. But soon after the start of the ONR the tension became more pertinent once again. The environmental stakeholders wanted to leave the ONR because they felt neglected. Instead of joint fact-finding, the environmental groups felt that they could only react to the facts. The environmental groups were also unhappy about the communication and indicated that their recommendations did not reach the minister at all (Weggeman, 2003).¹¹

The civil servants working and thinking together in the BOM were rather hesitant of the open plan process again. They continued with the preparation of the plans for the

Maasvlakte II and this led in turn to the resistance of the ONR. They wanted a joint decision-making process to consider the choice of one of the alternatives for the expansion of the Rotterdam harbour.

Under the lead of a mediator, Hans Alders, the stakeholders were brought to talking terms again. The main action was the evaluation of the ONR. The evaluation resulted in a recommendation to the minister in which Alders indicated that a Top Council could be a solution for the negative feelings of the different stakeholders. This Top Council was composed of representatives of large interest groups (ONR and BOM). The environmental stakeholders remained negative about the chances. They wanted full participation in the dialogue about the options for creating additional space for port activities. The document PMR on Course (Koers) at the end of 1999 fed the negative feelings again, because the option of expanding the port in the South Western part of Holland was described as impossible. The environmental stakeholders refused to sign the process covenant. The environmental groups even left the ONR again. The stakeholders directly reacted to a letter in a Dutch newspaper (NRC) in which the scientific board of the PMR indicated there was no justified reason why the third option was seen as impossible to realise.

An advisor In 't Veld was approached to resolve the impasse. He indicated trust should be re-won to bring the stakeholders closer again. The minister asked Alders again to mediate. Finally, there was agreement on a new style for the (formalised) ONR in which the ONR could play a more active role and advise the minister more directly. This advice was the result of a process in which joint fact-finding was placed more centrally. The ONR (Consultation Non-Public Actors) was located beside the BOM (Consultation Public Actors) in the Top Council and has a new direct link and consultation to the minister of Public Works.

Interactions in the Peripheral Arenas

Some of the actors did not actively participate in the first policy game. At first it was these actors who were disappointed about the openness of the plan process. Some environmental interest groups decided to leave the discussion arena because they felt their stakes were not represented strongly in the discussion. These stakeholders finally returned partly in the ONR, after the ONR obtained a more central role in the interaction process at the beginning of 2000. Meanwhile, at the end of 1999, the municipality of Rotterdam invited three environmental interest groups (Consept, Natuurmonumenten and the Society for Nature and Environment) to discuss the incorporation of the environmental stakes (the 750 ha compensation). In June 2000 the actors recommended that this arena should be called Vision and Heart. This arena was known to the actors in the ONR and influenced the outcomes of the ONR discussion indirectly. The publication of the recommendation some weeks before the official advice of the ONR did create some tensions, but these have not had a divisive influence on the stakeholders in the ONR. This is called a peripheral arena, because the actors could only reach the final decision makers via the ONR.

The second peripheral arena was loosely coupled and did not participate actively. It involved the initiative to explore the possibilities for private contributions to the financing of the project. This economic arena was founded to search for financing options for the Maasvlakte II. This arena represented the economic stake and expected the Maasvlakte II to be realised. In other words, they were already preparing the execution of the project. This indicates that the doubts of the environmental interest groups about the real choice between the alternatives can be seen as justified. The political arena was relatively absent in this round, only the minister was regularly informed by the Top Council and project

organisation and received recommendations from the BOM and ONR arena. The same applies for the parliament, which only judged the zoning procedure after completion.

Towards the Crucial Decision in the Political Arena

The crucial decision taken in this round was the choice to favour the Maasvlakte II as the solution to the problem of lack of space for the expansion of the Port of Rotterdam. The minister and the parliament finally made this decision. The preparation of the zoning procedure was made in consultation with ONR and BOM. The linkages between the political arena and the ONR arena were intensified in the Top Council as a consequence of this crucial decision. It was laid down in the zoning procedure document part 1, which was sent to the parliament on the 11 July 2001. In this document the contents of the plan were described.

Complexity in Expanding Rotterdam Harbour: Outcomes, Arenas and Actors

This section looks at the dynamics and complexity of the decision-making process. The focus is on the VERM (Exploration Spatial Need Mainport) and PMR rounds (Project Mainport Rotterdam). First, the achieved outcomes in each of these two rounds are compared and an attempt will be made to find some explanations for the differences.

Outcomes of the VERM and PMR Round

If the achieved outcomes of the two most important decision-making rounds in the game around the expansion of the Rotterdam Harbour are compared, some striking differences can be found. In general, the evaluation of the outcomes of the PMR round was more positive compared to the evaluation of the VERM round. The number of actors that were satisfied with the decision is higher in PMR than in VERM. Although the VERM process was very open at the core (the interactive process), this openness of the process was not present in the final stage of the VERM where the decision was being prepared for parliament. The PMR process was mainly open for well-organised interest groups, but less so for individual citizens.

It can be said that in the PMR round a real intertwinement of goals was achieved (Koppenjan & Klijn, 2004). The achieved solutions were inclusive in the sense that they satisfied various values at stake, and were reasonably enriched so that actors were satisfied. Alternatively, in the VERM process no real enrichment was achieved and only a few actors were satisfied. The outcomes could also be framed in a slightly different way (but with the same result). In the VERM round the initial decision to choose expansion rather than other options (such as better use of existing space) was not challenged. In the PMR round hard negotiations took place to receive various types of compensations for the environmental losses of the extension solution. The achieved compensation resulted in a relatively high satisfaction with groups that were not satisfied in the previous round. An overview of the evaluation of the outcomes can be found in Table 5 (the dimensions are derived from the theory in second paragraph).

An interesting question is how to explain the differences in outcomes of the two rounds. As explained in the second section, the answer must include an examination of actor dynamics and positions, the activating and de-activating of arenas and the management efforts.

Table 5. Outcomes in the VERM en PMR round

Dimension	VERM	PMR
Satisfaction of actors	(+/-, -) Satisfaction rather low with environmental groups, and individual citizens, reasonable with economic interest groups, mixed feelings in parliament, reasonable satisfaction with departments	(+) In general relatively high satisfaction with all actors that have been present in the process (environmental and economic interest groups, public actors) Very satisfied parliament
Enrichment	(+/-, -) Limited enrichment. Much information was only available at the end of the process. The proposal at the end did not differ much from the beginning of the process and the argumentation did not always refer to the findings of the process (or sometimes even conflicts with it)	(+, + /-) Some interesting ideas to combine economic development with environmental values (compensation). Not necessarily new ideas but making the combinations was essential
Process (openness, participation)	(+/-) The VERM process itself was very open and with participation of a wide variety of actors, the decision-making after the organised VERM process within the department was however rather closed	(+/-, +) Limited open process (mainly accessible to organised interest groups but not for individual citizens or less well organized interest groups)
Conclusion	(+/-, -): Involvement of many actors but a lot of dissatisfaction and limited enrichment	+ Reasonable involvement, many satisfaction with actors a good enrichment

Actor Dynamics and Positions in the VERM and PMR Rounds

Looking at the actor analysis of the two rounds, only a limited number of differences in the actors and involvement in the two decision rounds can be found. Most of the actors involved in one round were also involved in the other round. The main difference was the strong involvement of individual citizens, but not well-organised interest groups in the VERM (due to the interactive character of the process). These were largely absent in the PMR round, where more intermediary actors were involved. They had a better position in the PMR round because their chance to give legitimacy to the process increased through the parliamentary decision that there should be more attention to both the economic aspects (expanding the port) and to the environmental aspects (benefits for the environment).

There was also a difference in the way non-public actors (mainly societal interest groups) were tied to the decision-making process. In the PMR round the influence of the non-governmental actors was more secure than in the VERM round, or to put it another way, the level of participation was more intense. The stronger position of environmental groups and the more intense level of interactions created a stronger interdependency between the actors and a need to combine ideas and develop solutions that satisfied various actors (Weggeman, 2003). This cannot be seen apart from the presence of some intermediary actors in the PMR round. It seems that the PMR round was better designed for interaction.

The Flow of Decision Making: Activating and De-activating Arenas

After the round in which the project was initiated, the decision-making process expanded strongly in the VERM round. Many actors entered the game and more different arenas were created and/or activated. Compared to the initial round, it could be said that the game expanded enormously in the second round. Every round had its activated arenas

(and by implication its activated actors), and each arena had its own temporarily constructed organisational arrangements. Just as the VERM round had its special organisational arrangements (organised by the project bureau VERM), the PMR round (as The Top Council) had its own arrangements. Identifying the arenas makes it possible to observe the expansion (or contraction!) of the decision-making process and thus analyse the nature of the complexity.

The arenas in both rounds were relatively similar. The only difference was that the discussion of the VERM took place in two separate arenas, while in the PMR, the ONR and BOM arena came together in the Top Council. It is striking that the discussion arena in the VERM had relatively little influence on the crucial decision whereas the ONR, BOM and Vision and Heart arena in the PMR influenced the political arena in direct (advising minister) (BOM/ONR) and indirect ways (advising minister via ONR). The active discussion arena of the VERM round split up in two or three arenas in the PMR. The project organisation (condition arena in VERM) changed into an intermediary mitigating actor binding the three other arenas. The political arena only changed internally and was as active in both rounds, but had more influence in the PMR round. The expert and initiating arenas of the VERM were incorporated more or less in the other arenas in the PMR. These switches of arenas illustrated the dynamic character of the policy game. In the first round only the departments and the port authority were active as initiators. During the VERM and PMR round, arenas became active and then de-activated again. The dynamics were high but the linkages between the arenas particularly grew in the PMR round. After the PMR round, to a large extent the policy game lost its dynamics.

Managing the Connections: A Multitask Job

As the two rounds are compared, it can first be observed that the connections between the different arenas and decisions were better in the PMR phase. The political actors (both ministers and members of parliament) were better connected to the other decisions in the PMR compared to the VERM case, which showed a rather sharp demarcation between the open interactive phase of the round and the departmental and political decision making afterwards (Klijn, 2003).

The job of managing the interactions in the decision-making process is not the job of one actor. In the VERM round the study found at least two network managers who took care of managing (part of) the interactions: the project group VERM and the Ministry of Transport. The latter actor only managed the procedure of preparing the proposal for the parliament. For the PMR the project organisation PMR was one of the managers. This is the only actor which participated in BOM and ONR and coupled some results. The same goes for in 't Veld and especially Alders. His management of the process combined the public wish to incorporate the non-public actors in the plan process. In short, it can be concluded that the network management activities in the PMR round were more intensive and were aimed more at connecting actors and arenas than in the VERM round. This is certainly an important part of the explanation of the greater success of the PMR round (see Table 6).

Postscript: After the PMR-Round, Unforeseen Impasse

The provision of the first part of the zoning-procedure to the parliament in July 2001 marked the start of a political process. In this round the Cabinet proposals were discussed in the parliament and were open for public consultation. The discussion on, and the preparation of the second, third and fourth part took some time (until mid-2003).

Table 6. Network managers and network management activities in VERM and PMR round

Round	Managers	Activities
VERM	Project bureau VERM (VERM arenas) Ministry of Transport (for the initial decision arena)	VERM project group: co-ordinating interactions, organising research/information process
PMR	PMR project bureau individuals ONR	PMR project organisation, joining discussion in BOM and ONR. Managing process between non-public and public actors

Meanwhile, the Top Council was regularly informed and asked for recommendations, but no real interactions occurred

From 30 September 2003 until 30 November organisations and individuals were able to object to the concrete decisions laid down in the fourth part of the zoning documents. Twenty-six objections were made by different individuals (farmers, fishermen) and organisations (people of Oostvoorne, Concept). All these objections were dealt with, some were rejected, some approved. This was followed by the final decision of the Council of State who expressed doubts about some environmental aspects (such as the transport of plankton, Gulf Stream flows along the Dutch coast). These doubts led them to reject the fourth part of the zoning document.

This does not mean the whole process of interaction has to be redone. Only the final part of the zoning procedure will start again. The zoning procedure documents have to be changed, according to the guidelines of the Council of State and new objections can then be produced. The Council of State will then decide again whether the project can be approved or not.

If an analysis is made of the grounds on which the Council of State based its rejection, some interesting explanations can be identified. First, many of the objections came from actors who were largely neglected in the process: farmers and fishermen. Second, objections of the farmers and fishermen were related to the compensation measures taken in the project. Since the interaction between the actors and arenas in the second and third round, the compensation of 750 ha of natural areas was incorporated. This second project raised some doubts with some fishermen, and especially the farmers, and eventually resulted in the objections. It can be seen that although the decision on the Maasvlakte II was widened to achieve a win-win situation in the conflict economy-environment, at the same time this sparked a new game in which environmental conservation had to be weighted against fishery and farmer interests. This new game also activated new and other networks, which had not been present before. To this extent, it can be said that increasing complexity solves complexity and results in new complexity: an interesting paradox

Conclusions

This article has analysed two rounds of a complex decision-making process and their outcomes. First, the complexity in the policy process was identified. This was done using concepts from network theory (actors, arenas and interactions). After that an attempt was made to identify factors that contributed to the potential successful outcomes of the complex decision-making game. The conclusion was that the better outcomes of the PMR round compared to the VERM round could be attributed to the stronger position of environmental groups in the second PMR round. It was also the consequence of the better

network management activities that were performed. To conclude, some observations about these complex processes are presented.

Complexity as Paradox

The size of projects such as the Maasvlakte II, and the impact of the project on many actors, makes them complex. As the article has shown, the policy game surrounding the Maasvlakte II is composed of different actors and arenas. The decision making expanded from the first round to the second round, due to the involvement of more actors and arenas and shrank again in the fourth round. This analysis of the games and arenas makes it possible to picture the complexity of decision making, and gives an image of who and what is connected in decision making.

Interestingly, this complexity also allows for solutions which cannot be achieved without the complexity. Since the problems and the value conflicts that are tied to solutions are of themselves complex, it is only through the involvement of many actors and resources that a satisfactory solution becomes possible. It is increasing complexity (including more actors and arenas) that makes it possible to achieve solutions that are acceptable to all actors. However, the PMR round illustrated that this is far from an easy job. The conflicts between actors and their values are a constant tension in the process, which has to be managed very carefully. As many authors point out such processes are energy- and time-consuming (Innes & Booher, 2003; Koppenjan & Klijn, 2004).

The Interaction Process Cannot Guarantee Successful Outcomes

The interactive character of the policy game, although laborious, gave the policy process a relative smooth character. As Weggeman has argued, the Maasvlakte II is a good example of a typical Dutch interactive decision-making model (Weggeman, 2003). Important for the managerial effort are the efforts to connect arenas and actors, which here are called strategic management or managing the interactions. The ONR, BOM, VERM and Top Council were examples of arrangements with interactive powers that were intensively managed. In addition the interesting content of the project seems to be crucial for the interaction process. The possibility to change the contents during the process (enrichment) and in that way to interest and satisfy various actors is important.

The rejection of the zoning procedure of the Council of State seemed to be a complete surprise. It was observed that this rejection was due to actors not intensively connected to the decision-making process. It provides two lessons. One is that even well-guided interactions can enhance the changes for success, but it cannot guarantee it. The complex character of interactions in networks always can cause surprises. The second lesson is that expanding the range of decision making by including new arenas (as new policy issues) can also affect new actors who want to be involved in the decision-making process. There was not enough anticipation of this in the managerial efforts.

Creating Positions and Incentives to Interact

The final interesting observation is that the PMR round was also successful because the interdependencies between actors represented different values (economic and environmental values). When these tensions are stronger it gives the process more incentives to search for new interesting solutions, or at least interesting compensations. The dominance of actors who favour the expansion, and the limited connection of the interactive decision-making phase to powerful actors and existing institutional arrangements, prevented this

in the first VERM round. In particular, politically elected officials can create these incentives and can thereby have more impact on decision making than they normally have.

Acknowledgements

This article is a result of a research project which is part of and supported by the BSIK research Innovative Land Use (Vernieuwend Ruimte Gebruik (VGR)), which is co-ordinated by Habiforum. The research is also supported by a grant by the Port Authority Rotterdam and incorporated in the research project TransPorts in the BSIK research programme Transition Towards Sustainable Mobility (Transumo).

Notes

1. In the period in which the Port Plan 2010 was prepared, the public organisations (national level, provincial and local) and some private actors were organised in the ROM-Rijnmond. This covenant for Spatial Planning and Environment was meant to research an integrated framework for a sustainable spatial policy in the Rijnmond Area (the area in which the port of Rotterdam is mainly situated).
2. Power is also connected to the existing rules of the network, which give some actors more access or authority or prevent certain topics. This is the famous invisible side of power (for a detailed examination, see Koppenjan & Klijn, 2004).
3. The word game is used here in the same sense as other public administration scholars (Allison, 1971) and sociologists (Crozier & Friedberg, 1980) and not in the rational formal sense of game theory. Although interesting connections have been made between network theory and game theory (Scharpf, 1997), the empirical relevance of a limited number of game types is limited. The word game here is a concept (as it is with Allison) to indicate the dynamics of the interactions and the idea that outcomes are a result of actors and their positions, strategies and the interaction of strategies (see Koppenjan & Klijn, 2004).
4. Klijn participated in some of the meetings and two of his masters degree students were actively involved in the organisation of the VERM process (see Videler, 1997; De Vries, 1997). This enabled an inside view into the whole process (see also Klijn, 2003).
5. The case was part of PHD research on deliberate forms of governance in The Netherlands.
6. Zoning procedure is a free translation of the Dutch term "PKB" (Planologische Kernbeslissing) or Spatial Core Decision in English. The PKB is a zoning document (made in several steps) on which spatial decisions are based and find their legal basis.
7. The concepts central and peripheral thus refer to the density of interactions in the game.
8. Consultation Non-Public Actors will be named ONR (Overleg Niet Rijkspartijen in Dutch) in the remainder of this article. The ONR is the forum where the non-public actors met each other and discussed the alternatives of port expansion and tried to make their advice heard among the ministers and within the departments. The ONR was formalised in 2000.
9. Public Consultation Mainports will be named BOM (Bestuurlijk Overleg Mainports) in this article. The BOM was the forum in which the public actors met each other and discussed the alternatives of the harbour expansion. They were directly linked to the departments and ministers.
10. The Top Council (Top Beraad in Dutch), was an organisational arrangement, which was directly linked to the minister of Water management, Transport and Public Works. In the early years of this round, only the BOM was directly linked, later on the ONR was incorporated as well.
11. See also an interview in 2005 with a member of the project team on the Maasvlakte II within the Port Authority in Rotterdam.

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