

## **Governance analysis case Noordwijk: 'weak links' along the coast**

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## **Introduction to the Noordwijk Project**

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### **Introduction**

As an introduction to the governance analysis, the aim of this introduction is to give a clear overview of different aspects of the Noordwijk project. For a start, I will pay some attention to the Dutch delta in times of climate change in general, just to give a clear view of what's actually happening in the Netherlands; what are the risks and vulnerabilities which make adaptation necessary? A more substantive part of this paper is on the procedural and financial aspects of the Noordwijk project; what were the objectives of the project; which parties have been involved; which procedural steps and which concrete measures have been taken; and who did actually pay for the measures taken? Finally, I will draw some short conclusions.

### **The Dutch delta in times of climate change**

As most of you will know, the Netherlands are a densely populated country with many important economic sectors, such as agriculture, industries and other kinds of commercial activities. Over half of the Dutch population and the major part of the Dutch economy are situated in the west, near the North Sea coast line. This part of the land is a low-lying area, with many so-called polders, which is mostly situated at or even below the sea level. This makes the area, and all the sectors within, especially vulnerable to the adverse effects of climate change, such as sea level rise, increases in river flows from the east, and extreme changes in precipitation patterns. To take away or to minimize these societal risks, adaptation measures should be taken. The Dutch land and the Dutch society for centuries have been protected against flooding from the sea by quite a thin line of dunes, often referred to as the 'coastal foundation' or 'kustfundament'. But as we focus on sea level rise, the question rises to what extent the Netherlands will still sufficiently be protected against flooding in future times. Research points out that the safety level nowadays and in the near future in general is sufficient or at least acceptable, but there are a few 'weak links' within the coastal foundation (see figure). At these weak spots measures (adaptation measures)

should be taken to prevent us from water nuisance and flooding from the sea, and to take it a step further from doom scenarios such as 'Amersfoort aan Zee'. Also Dutch environmental, spatial and coastal policy refers to these weak links and suggests measures to be taken, for instance in the Dutch 'Nota Ruimte', the third 'Kustnota' and the 'Procesplan zwakke schakels in de Nederlandse kust (januari 2003)'.

### **Towards a project group 'Reinforcement weak link Noordwijk'**

One of the weak links is located at Noordwijk (or rather at Noordwijk aan Zee; see figure). Noordwijk is a small coastal town with a highly developed and flourishing tourist industry. It is located in the Province of Zuid-Holland, to the north of The Hague, to the south of Haarlem and near Leiden. Noordwijk, in late 2003, was officially pointed out as a weak link of *high priority* by the Dutch State Secretary, as a result of a judgment of the competent dune management authority (in case the Water Board of Rijnland) earlier that year. As a reaction to the designation of weak links, the Province of Zuid-Holland started the project 'Kustvisie Zuid-Holland' in 2004, thereby taking on the procedural lead over the development of plans relating to the various weak links on its territory. For each weak link a 'project group' was established, in which all public parties involved were represented. With the establishment of these project groups an actual start – may it still be on a procedural scale – had been made with the execution of the necessary adaptation measures. The project group 'Reinforcement weak link Noordwijk' consisted of representatives of the Directorate-General for Public Works and Water Management at the central level, the Province of Zuid-Holland, the Water Board of Rijnland and the Municipality of Noordwijk, as all these authorities were involved within the project as to their specific legal tasks. The Water Board of Rijnland took the lead over the project group, as it is the competent dune management authority. The main task of the project group was to coordinate and to guide actions concerning the study of possible reinforcement measures, and eventually to decide on a reinforcement plan, which *formally* would be enacted and executed by the Water Board of Rijnland.

### **Towards a dune reinforcement plan**

But before the enactment of the reinforcement plan, some other procedural steps had to be taken, as said, by the project group, formally guided by the Water Board of Rijnland. As a first step, in May 2005 a 'startnotitie' or 'starting paper' had been drawn up, in which seven possible reinforcement measures were investigated and tested on their feasibility. Amongst these seven, there were three landward solutions, three seaward solutions and one 'consolidating' solution. The feasibility studies pointed out that all landward solutions were simply too expensive and too radical to the living environment of Noordwijk and its surrounding, so only four solutions remained, as they all met the objectives of the project. These objectives, by the way, were twofold: the project should lead to a higher level of safety against flooding and water nuisance from the sea, but it also should lead to an improvement

of the spatial and environmental quality of the area, by creating new possibilities for economical and recreational developments. In June 2006, the four remaining solutions were further investigated in a 'project paper' on their spatial and environmental effects, and their costs. Based on this investigation, the Water Board of Rijnland stated to have a preference for one of the seaward solutions, namely the construction of a concrete embankment inside of the dunes ('dijk in de duinen'). This preference would eventually be worked out in a *concept* of a dune reinforcement plan, which was announced to the public on 30 June 2006 and was sent to the Province of Zuid-Holland in July of that year. Between 2 October and 13 November, interested parties were formally able to give their views on the plan and the relevant decisions, which led to 22 reactions of civilians, hotel owners and other interested public and private organizations. Some of these views led to amendments of the concept of the reconstruction plan. Eventually, on 31 January 2007 the final dune reinforcement plan was drawn up by the Water Board of Rijnland, and sent to the Province of Zuid-Holland for approval. The Province approved the plan on 1 March 2007, and announced its decision to the public. Interested parties were able to lodge an appeal against this decision at the Dutch Council of State. As far as I know, there was one appeal, but according to the judge it was to be considered unfounded, so at 3 September 2007 the factual reinforcement of the dune could take a start.

### **Factual reinforcement measures**

The question remains what actually happened in Noordwijk; to which factual measures did the procedure as described before lead? First, I have to admit that I'm not an engineer, nor a geologist, so I can only tell you the facts and not all the technical aspects of the project. It also has to be mentioned that to realize the *safety objective* in fact no large-scale measures were of need; to solely meet this objective, it would only be sufficient to build an embankment within the dune. Although, to meet both objectives, more radical measures were of need. In short, the concept of the reinforcement plan held the construction of a concrete embankment within the dune at the location of the boulevard. At that place, also a new dune slope would be constructed, varying in height from 8.5 meters to 11 meters above sea level, and this slope would also be broadened by 50 meters towards the sea. The slopes of the existing dunes 250 meters to the north and south of this new slope would be broadened by 30 meters towards the sea. Eventually, these new dunes would be reconnected to the existing dunes more or less 750 meters to the north and the south of the boulevard. As I told before, public participation led to some amendments of these plans. In fact, the height of the dune would not be 11 meters, but only 10.30 meters above sea level. And also the width of the new slope would be 42 instead of 50 meters. But as you can see, these amendments were of minimal relevance. The execution of the project took place in the fall and winter period of 2007 and the early spring of 2008, mainly because not to burden the recreational sector too heavily during the summer period. Before the measures were taken, an emergency dune was constructed to prevent the hinterland from flooding, just in case

storms or high water would occur during the project period. The project, eventually, was finished in April 2008.

### **Financial aspects**

As I promised before, I will tell you something about the financial aspects of the project. The total project costs were about 20 million Euros, damages included. We have seen that several public parties across all scales were involved within the project. At the central level, the weak links were pointed out; the coordination of plan development took place on the provincial level; the Water Board of Rijnland enacted the reinforcement plan and took the reinforcement measures; and the municipality took care of the spatial planning aspects within the project. Before the measures were taken, these parties made agreements on the division of the costs. These agreements came to *full payment* by the Dutch State, as especially national safety interests were taken care of by the measures. The Dutch State, though, was not directly involved with the choice of measures and the execution of plans, as this was mostly left to lower administrative levels. As told before, in the project paper four possible solutions were investigated on their costs and effects, but as to meet both aims of the project, not necessarily the cheapest option should be chosen. In fact, one of the more expensive options was chosen, as to meet the objective to improve the spatial and environmental quality of the area, by creating new possibilities for economical and recreational developments, combined with the safety objective. Also damages were an important part of the costs of the project. Although possible damages and liability have never been a reason *not to take* any measures, legal carefulness forced the executive parties to keep damages as low as reasonably possible. Obviously, this did not make parties strive to no damages at all, as within projects like these some damages from lawful government acting are just 'part of the deal', but unreasonable damages or damages that were unreasonably high were preferably to be avoided. Public participation has been an important tool to find out which damages were to be expected, and which damages could possibly be avoided. As we have seen, public participation lead to some amendments of the project plans, mostly to partly or even fully avoid damages.

### **Conclusions**

It's time to draw some short conclusions. Firstly, the Noordwijk project had *two clear objectives*. The first was a safety objective. As in fact safety measures should be taken, a possibility originated to also take measures to support the improvement of the spatial and environmental quality of the area, by creating new possibilities for economical and recreational developments. This was the second objective. Through the safety objective the whole project was widely publicly supported; there wasn't hardly any discussion on whether measures should be taken at all. Secondly, at four different administrative levels

public actors were involved in the project. There are many examples of projects where this led to problems, for example as to division of competences, but in the Noordwijk project *clear agreements* were made on which government actor was responsible for what action. The most important agreement was that the Water Board of Rijnland was formally responsible for the enactment and execution of plans and that the Dutch State would pay for the measures and damages. Thirdly, during the whole process a *clear and structured procedure* was followed, in which all decisions were clearly motivated and announced to the public. Public participation was of high importance within these procedures from an early point of the process on, as the project needed public support. Where damages could not be avoided or where certain views could not be fit within the project plans, private parties were offered compensation for damages and their legal possibilities were clearly pointed out to them. To my opinion, these and other aspects of the Noordwijk project contributed to the success of the project, at least from a legal point of view. In the next essays, an analysis of the Noordwijk project will focus on its scientific, governance, legal and economic merits.

**Case "Noordwijk at Sea":  
adaptive water governance from a public administration point of view**

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**Introduction**

The dynamic, uncertain and complex nature of climate change and related water issues (water safety, water quality and water retention) requires our abilities as governors, politicians, officials, experts, citizens, and humans to act adaptively. It calls for adaptive governance and above all it requires collaboration on different scales (local, regional, national, global), in different domains (water management, sustainability, spatial planning, economy, nature and ecology), and in different (societal/non-governmental, private/business and governmental) spheres. Climate change is a multi-faceted issue that calls for a governance approach that emphasizes horizontality and reciprocity. In this paper I discuss the case Noordwijk at sea from a water governance point of view, which I see as an approach in which the interplay of processes of coordination and cooperation between various actors (national, provincial and municipal governments, private parties and public interest groups) that takes place at the interface of climate adaptation, adaptive water management, and regional spatial development, where climate adaptation measures, regional perspectives (planning and development) are formulated and implemented in conjunction with solutions to water issues (Edelenbos, 2010).

**Adaptive water governance analysis of the case Noordwijk at Sea**

What strikes most, analyzing the case, is that the project is developed and implemented in a relative short period of time. The project was announced in May 2005 (starting document, 3rd of May 2005). At June 30, 2006 the project design was completed. The project implementation started at September 3 (2007) and the implementation ended in April 2008. An overall project development and implementation time of 3,5 years! That is remarkable. At the beginning a fixed scheme of proportions (allocation of costs under the involved government institutions was determined) by which national governments paid most of the

new coastal defense, and the local government paid the costs for additional spatial aspects (spatial quality).

A second observation is that from the start the project got a broad programmatic approach. By this approach I mean that different aspects, values, and ambitions were coupled during the whole process; coastal defense, spatial planning, land use and quality of the surroundings were constantly coordinated and synchronized. A multi-disciplinary project team was set up, which consisted out of actors from different governmental organizations: ministry of Infrastructure and Water Management (represented by the implementation agency Rijkswaterstaat), the province of South-Holland, water board Rijnland, and the municipality of Noordwijk. The members of the project team met on a regular basis. So different governmental scales and levels, national, regional and local were represented properly during the whole process. Assessments and decisions to meet climate change and water safety were not taken at the expense of other values. Moreover, spatial and land use quality were decisive aspects and values for selecting the preferred seaward solution of 'dike in dunes'. Interests of different stakeholders behind and on the dunes (residents and land/property owners) were considered influential for choosing the preferred solution.

A third observation is that from the beginning the project team is aiming for a broad support by residents, NGOs, and land/property owners. A sounding board was installed in which different stakeholders could critically follow the process and give feedback. Moreover, a number of information and discussion meetings with various stakeholders were organized in search for opinions, values, interests and perspectives on the future development of the area. During these stakeholder meetings, the members of the project team provided (expert) information. There was also lots of room and opportunity for the stakeholders to raise questions, and start discussions on conditions, problem analyses and solutions. The panel discussions were led by the governor of the province of South-Holland (L. Dwarshuis). She took the role of mediator and took up different questions and discussion point and forced the experts and members of the project team to come with understandable replies. Expert opinions were critically questioned and a joint fact finding process was created in which expert, professional and stakeholder knowledge were confronted and merged into serviceable truths and negotiated knowledge (Edelenbos et al, 2010). During one of the meetings a survey was held under the stakeholders to test the amount of support for preferred solutions. The 'seaward dike in dunes-solution' was supported most. The input provided by stakeholders was taken seriously and had impact on discussions and the future process of the project. The project was adapted to reactions and responses of stakeholders (in the interactive process and in the legal public participation procedure), for example with respect to the height of the dunes and the length of the dune area. Stakeholder input was consolidated throughout the process. In this way throughput-legitimacy (March, 1999) was created and support for the process and their results were organized properly.

A next observation is that adaptive water management evolved in which maintenance of the area was discussed in the development of plans (often-times maintenance is discussed relatively late in problem-solving processes), and where solutions were developed that hold

a certain degree of flexibility for future developments and events. The water board Rijnland was held accountable for the whole project. The water board implemented process management over the project and was held responsible for realizing multiple goals and ambitions in the project. Water boards in the Netherlands are in transition nowadays, developing itself from a water (safety) assessor (at the end of spatial planning projects) towards an adaptive water board, which hold a proactive attitude in spatial projects (Van Buuren, Edelenbos & Klijn, 2010).

Resilience is also visible in selecting the preferred solution, dike in dunes. This solution was preferred above other solutions, for example dam in dunes, because the latter is less adaptive to future events and developments. If necessary a dike can be heightened. A dam is a more robust solution, but at the same time less flexible solution. Sea and ocean currents and breakers are complex systems that are highly unpredictable and erratic of nature. A final observation is that although the process was implemented quite efficiently (time frame of 3,5 years), this comes at a certain expense, i.e. of innovation. The project team was very much oriented on time efficiency in order to create a new safe situation as quickly as possible, and therefore at the same time opted for known technological solutions. New solutions further seaward, as sea harbors, reefs, etc. were not fully considered, because they took too much research time. Also options to combine the dike with parking lots were not taken seriously because this would endanger the 'swift implementation' the water board and the other members of the project team considered of the utmost importance. There is always a trade-off between efficiency and innovation, which was also visible in this project. In all, the project Noordwijk can be considered a project that evolved rather quickly and in which the project team was considered adaptive to stakeholders' values and perspectives and to possible future development. In many cases a model for other project in the Weak Link Coastal Defense Program (such as Katwijk at Sea).

## Legal analysis case Noordwijk: 'weak links' along the coast

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### 1. Introduction

A legal analysis of the coastal reinforcement in Noordwijk as part of the tackling of the 'weak links' along the North Sea coast encompasses various questions. These questions relate to the normative, organizational and implementation aspects and these occupy a different place and order, also in time.

In this short analysis I will deal with a number of legal aspects relevant to the case of Noordwijk. These are the protection of various public interests, the division of responsibilities and powers, legislation, decision-making and implementation, public participation and legal protection, and recent changes in legislation. The analysis leads to a few concluding remarks.

### 2. The protection of public interests: a ranking

Coastal reinforcement in Noordwijk falls within the performance of a public task. Why would the government otherwise wish to undertake any action? In order to determine the contents of this task, a closer look must be taken at the goals underlying coastal reinforcement.<sup>1</sup>

#### *Safety*

Coastal reinforcement in Noordwijk aan Zee is primarily part of the public task to realize protection against floods, an issue that as of the first constitution in the Netherlands has been on the same level as for instance defending the country against invasions by foreign nations.<sup>2</sup> The protection against floods (water management) at present is part of a social

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<sup>1</sup> Water Act articles 2.1 en 2.2, Ministry of Transport, Public Works and Water Management, 3rd Policy Document on the Coast, Tradition, trends and future, The Hague, December 2000.

<sup>2</sup> De Ru even refers to the care for water management in the Netherlands as being a primary state goal that is directly linked to the state structure: H.J. de Ru, *Staat, markt en recht. De gevolgen van*

civil right (article 21 of the Constitution), i.e. the care of the government for the habitability of the land and the protection and improvement of the environment. The care for water management thus seems reduced to one of the government's many duties of care, however, water management in the sense of protection against floods and the concern for the habitability of the land still holds -and rightly so- a special position in Dutch law.

Flood protection is thus generally recognized as a legitimate exception to the strict nature conservation regime of European and national law. Both the Water Framework Directive<sup>3</sup> and the Marine Strategy Framework Directive<sup>4</sup> offer the possibility of exceptions in case of an 'imperative public interest'. Flood protection is generally regarded as an imperative public interest. As a result, although it is acknowledged that the required sand dredging and sand suppletions for coastal reinforcement may entail harmful consequences for the ocean-floor and for the ecology, coastal reinforcement can go ahead by invoking the exceptions offered by European legislation.

#### *Habitability of the land: spatial development and environmental protection*

The second public task that is served by coastal reinforcement is the care for the habitability of the land and the protection and improvement of the environment. The spatial and economic developments in Noordwijk before the coastal reinforcement were limited by the presence of buildings in the water defences zone.<sup>5</sup> The possibilities for spatial development have increased as a result of the way in which coastal reinforcement is being realized: these possibilities for spatial development may also be classified under the public task of the government. It is to be noted that this public task is also based on article 21 of the Dutch Constitution, but it is of a different order of significance than providing protection against floods. In addition, environmental interests are involved in the decision-making process: before a final decision is taken on the way in which to realize coastal reinforcement, an environmental impact assessment is to be made, in order to analyze the environmental consequences of the various alternatives.

#### *Findings*

When observing the developments with regard to coastal reinforcement, one notices that the questions as to which public interests are served and in what way the various interests are

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*privatisering voor het publiekrecht*, WEJ Tjeenk Willink, 1987, cited in Sap, Vermeulen and Zoethout, *De publieke taak*, Kluwer, 2003.

<sup>3</sup> Directive 2000/60/EG of the European Parliament and the Council of October 23 2000 on the adoption of a framework for Community measures regarding water management.

<sup>4</sup> Directive 2008/56/EG of the European Parliament and the Council of June 17 2008 on the adoption of a framework for Community measures regarding the policy on the marine environment.

<sup>5</sup> Rijnland District Water Board, Preliminary memorandum reinforcement weak link Noordwijk, May 3 2005.

taken into account, are clearly being dealt with. Flood protection is paramount. The possible environmental consequences of the alternative ways in which the project can be realized are taken into account. In addition the opportunities for spatial and economic developments are included in the decision as far as possible.

However, in practice the fact that something is regarded as being a public interest or a public task does not mean a whole lot. More is needed in order to serve those interests: policy and legislation in order to provide the necessary powers and instruments to serve those public tasks, and instruments to promote an easy implementation hereof.

The special place of the tasks to take care of safety and of opportunities for spatial development is restricted by another important legal principle that applies to all governmental decisions: even when serving a special interest, the government also has to take into account all other interests at stake and to include these in its decision-making process. In this regard one can think for example of the interests of businesses and of private persons suffering temporary damage during the execution of the project or permanent damage after the realization of the project.

### **3. Responsibilities and powers**

In a legal analysis it is important to study the relevant responsibilities and powers. Put in simple words, a number of basic rules apply.

The government is only entitled to interfere with the rights of citizens if it was explicitly awarded the power to do this. This is called the principle of legality.

The rule of speciality further stipulates that a power awarded may only be used for the promotion of the interest for which that power was awarded. The rule of speciality has been an important impediment to the realization of integrated water system management within a framework of sectoral water legislation.

Finally the maxim 'no responsibility without a power' applies. This means that no responsibility exists without the pertaining powers, but if one does carry the responsibility and the pertaining powers, one is in principle obliged to use these in case the circumstances so demand. However a certain discretionary power as regards the question whether and how to use these powers and take into account the various interests, is the starting point.

The primary responsibility for the North Sea (article 3.1 Water Act) and for the management of the coastline rests with the Minister of Transport, Public Works and Water Management (article 2.7 Water Act).

The seashore is owned by the central government.

The water control board - in this case the Rijnland District Water Board- is responsible for the dikes. The district water control board adopts a project plan to this purpose.<sup>6</sup> With regard to dike reinforcements the cost of the reinforcement of the primary flood defences are paid by the central government (article 98 Water Boards Act). The same applies to the cost of

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<sup>6</sup> At the time on the basis of article 7 of the Flood Defences Act.

compensation for losses resulting from administrative acts that may arise and for the cost of measures to be taken to restrict losses. The provincial executive supervises all primary flood defences (art. 3.9 Water Act)

The central government (the Minister of Housing, Spatial Planning and Environment), the province and the municipality are the competent authorities for spatial policy, that is the Spatial Policy Document (including the weak links), structural concepts and local plans. A project group was established in which the Directorate-General for Public Works and Water Management Department South Holland, the province of South Holland, the Rijnland District Water Board and the municipality of Noordwijk are represented.

### *Findings*

In this case the division of powers is not very complex. The tasks are clearly defined. The water management bodies take care of water management (sea, seashore and flood defence structures) and the general democracy takes care of spatial planning.

No problems arose with regard to the division of powers. Every authority executed its task responsibly and cooperated with the other government bodies if necessary. Tasks were not delegated to another government body. The central government is responsible for the general supervision, that is the management of the main features of the process and the provinces are responsible for the development and coordination of 'area visions' (management per weak link). The province also is the body that approves the reinforcement plans. The water boards are responsible for the actual planning per weak link (dike reinforcement plan) and for the execution. The Water Board has thus issued an expert opinion on the consequences of a heavier wave load for the flood defence structure,<sup>7</sup> and adopted the final dike reinforcement plan. The municipality is primarily responsible for the spatial planning of the area. This is not open to discussion.<sup>8</sup>

## **4. Legislation, decision-making and implementation**

### *Relevant legislation*

The public tasks being served by the coastal reinforcement are elaborated in legislation, which provides both the powers and the instruments to protect these interests. As the regime with regard to the primary flood defence structures has not changed substantially as a result of the entry into force of the Water Act on December 22 2009, this analysis will describe the relevant legislation as effective at this moment, although at the time of decision-making the Flood Defences Act constituted the legal framework.

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<sup>7</sup> June 2003.

<sup>8</sup> This division of responsibilities arises directly from the legal tasks of the competent authorities and can be found in the Process plan weak links Dutch Coast, The Hague, January 2003. The plan was adopted by the Administrative coordination coast.

For activities with regard to the sea and the coastline the Water Framework Directive, the Marine Strategy Framework Directive and the Water Act are relevant.

Important Acts for the construction of water management structures or for water management decisions are the Water Board Act (on the powers of water control boards and financing by the central government) and the Water Act (previously especially the Flood Defences Act).

For the environmental consequences the EIA Directive is important from the point of view of European law.

For the implementation licences were required on the basis of the Earth Removal Act, the Public Works and Water Management Act (now the Water Act), the Spatial Planning Act (planning permission), the Flora and Fauna Act and the bye-law (keur) of the District Water Board.

### *New insights as regards policy*

In the past decades the insight has grown that the promotion of safety may often be combined with the improvement of spatial quality. This double goal can be recognised clearly in this case, but can also be seen in projects that are part of 'Room for the River'. In this programme measures to enhance safety against floods are as far as possible combined with an improvement of spatial quality. This relation between water management and spatial planning can also be observed in legislation. Both the project Room for the River and the present case, which is part of measures to tackle weak links in the coastline, are included in spatial decisions, i.e. the key planning decision (PKB) Room for the River and the Spatial Policy Document (Nota Ruimte). Water management powers were defined in the Water Act and various arrangements were devised to coordinate the Spatial Planning Act and the Water Act. As a result water plans as regards their spatially relevant elements are also a structural concept plan (structuurvisie) as referred to in the Spatial Planning Act and the competent authority when taking spatial decisions is to take into account water management decisions on the basis of the said Act. Coordination between the municipality and the water board is provided for (article 3.8 Water Act) and the province is more specifically equipped to coordinate water, spatial and environmental interests at a more strategic regional level.

### *Decision-making requirements*

Several legal requirements apply to the decision-making process. For example, a decision is to be prepared carefully, weighing all interests involved. In the present case it is important that the interests of businesses (hotels, beach tent owners, a shell merchant and a sailing club) and of private persons (citizens of Noordwijk, especially those who live directly near the beach) are taken into account in the decision-making process. For this purpose among other things a number of alternatives were developed. These comprised landward,

consolidating and seaward solutions. The landward solutions were not studied in more depth as these would have big consequences for Noordwijk as a seaside resort. Subsequently a project memorandum was adopted including a preferred alternative.<sup>9</sup> The solution that was chosen in the end is a seaward alternative, i.e. the construction of a 'dike in dune'. Subsequently a draft dike-reinforcement plan was introduced into the procedure, which took into account the reactions submitted.<sup>10</sup>

In addition the proposed measure has to be proportional in order to achieve the envisaged goal. The nature of the violations of vested interests, existing rights of use and of ownership presented by the various proposed alternatives seems to have been sufficiently investigated. This was taken into consideration in the choice of the alternative to be finally implemented and the decision was taken to perform the activities in the winter season. For the reinforcement it was necessary to temporarily occupy plots of third parties, or parts thereof. The goal was to solve this occupation by agreement, so that it would not be necessary to invoke obligations to tolerate. And indeed, there has been no need for reliance upon obligations to tolerate. A good arrangement for compensation was also provided for in advance.<sup>11</sup>

#### *Dealing with uncertainties*

At the time of the preparation and adoption of the dike reinforcement plan legal standards applied for primary flood defence structures. These standards were already quite old; they dated from the sixties. In testing the primary flood defence structures it became clear that a number of 'weak links' along the Dutch coast did not meet these legal standards. This was the main reason to undertake coastal reinforcement. At present a discussion is taking place on a tightening of the Dutch security policy. This discussion not only focuses on the possible consequences of climate change, but also on the question whether a different method of safety standardization should be adopted. Core elements hereof are a transition from the chance of overtopping to the chance of flooding, a possibly larger differentiation per region or dike circle and the development of a multi-layer safety policy.

#### *Cooperation in the implementation of the decision*

The Ministries of Housing, Spatial Planning and Environment (Spatial Policy) and of Transport, Public Works & Water Management, the Rijnland District Water Board, the

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<sup>9</sup> Rijnland District Water Board, Project memorandum reinforcement weak link Noordwijk, June 30 2006. The project memorandum was drafted using the Initial memorandum and a pertaining Memorandum of reply.

<sup>10</sup> Rijnland District Water Board, Draft reinforcement plan weak link Noordwijk. June 30 2006.

<sup>11</sup> Compensation Order Rijnland 2005, later a consolidated version of May 9 2008 was effective. Nowadays for a project like this the arrangement for compensation on the basis of the Water Act would be applicable.

municipality of Noordwijk and the province of South Holland are all involved in coastal reinforcement. In addition, interests of private persons were involved.

### *Findings*

The cooperation between the various parties went well. The division of responsibilities between the Ministry of Transport, Public Works and Water Management and the water board is clear. The cooperation with the municipality has been relatively smooth, as the interests of the municipality were taken into account as far as possible. The interests of private persons were also taken into account as far as possible by performing the activities during the winter season as far as possible, so that recreational and catering businesses would suffer as little nuisance as possible. The shell trader's interest came into the picture quite late. As from the time at which this interest surfaced as a compelling interest, efforts were made to take this into consideration as quickly and as far as possible.

#### **5. Public participation and legal protection**

In coastal reinforcement various interests, i.e. of local and regional authorities, of businesses and of private persons, play a role. These parties were offered the possibility to join in thinking on the various alternatives of coastal reinforcement. This led to the selection of a different alternative from the one originally envisaged.

The project memorandum and the draft reinforcement plan were submitted to the provincial executive of the province of South Holland in July 2006. Between October 2 and November 13 the draft reinforcement plan, the project memorandum and the applications and draft decisions for the required licences were made available for inspection in order to enable everyone to express their views hereon. Some of the 22 views submitted led to an adaptation of the reinforcement plan, such as a lower maximum height and a lower maximum broadening of the range of dunes. On January 31 the Joint Assembly of the Rijnland District Water Board adopted the final plan and on March 1 2007 the provincial executive of South Holland approved the plan. The approval of the dike reinforcement plan constitutes a decision against which administrative legal recourse to the Administrative Law Division of the Council of State is available. The same applies to the other decisions that were taken (licences). This power was also used.<sup>12</sup> After the court's judgment that the plan could continue, it was clear to all parties that one could proceed in the way finally decided. For the parties concerned it is important to have the possibility to address the administrative court. Every person concerned wishes to defend his/her own interests. After the decision of the court, the issue of coastal reinforcement as such is not open for discussion anymore and this creates clarity for all parties.

It is nevertheless obvious that parties may suffer damage as a result of the implementation of the coastal reinforcement plan. At the time of the decision the regulation on the

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<sup>12</sup> ABRvS 5 March 2007, 200702359/1.

compensation for loss resulting from administrative acts of the Rijnland District Water Board was in force. At present the compensation regulation as referred to in the Water Act is applicable. The District Water Board engaged Grontmij in order to assist the persons concerned with the damage assessment and it developed standard application forms for compensation. In order to prevent insurmountable economic damage, the persons concerned were offered the possibility to apply for an advance payment, in which case the provisional damage assessment by Grontmij was taken as a starting point. The final evaluation of the applications for compensation was dealt with by an independent committee of experts. This heard all persons concerned separately, indicated where supplementary data were needed and subsequently presented a recommendation on the compensation to be paid. Both the District Water Board and the parties were entitled to react to this recommendation. In the end the board of the District Water Board decides on the final compensation to be paid. Against this final decision administrative legal recourse is again available.

### *Findings*

Public participation was taken seriously and in the end led to an adaptation of the original proposals. The involvement of private persons and authorities during the whole process has had a positive effect. As a result of taking into account the various interests as far as possible and of actually taking these into consideration both in the decision-making and in the implementation processes, there has been relatively little opposition against the coastal reinforcement. The fact that against the dike reinforcement plan and the final decisions on compensation administrative legal recourse is available is to be judged positively. Careful decision-taking is thus enforced and after the pronouncement by the court it is clear to all parties that the plan can be implemented. The existence of an independent court and an independent compensation committee are important, as this prevents the parties from thinking that they 'are entitled to think along, while the administration in the end does as it seems fit'.

## **6. Nature of and changes in the legal regime**

The coastal reinforcement plan was developed under the regime of the Flood Defences Act. As of December 2009 the Water Act has been effective, together with the pertaining Water Decree and the Water Regulation. National legislation is thus more in line with the integrated approach as prescribed in the Water Framework Directive, the Marine Strategy Framework Directive and the Flood Risk Management Directive. Coordination with the Spatial Planning Act was also improved. I am mentioning the following improvements.

1. As a result of the Water Act an integrated approach is not only facilitated, but has become obligatory.

2. Goals and standards are formulated more clearly and thus offer more legal security to all parties concerned. This already applied to the standardization against floods, but for other aspects of water management this constitutes a big advantage.
3. The responsibilities are clear: the Minister of Transport, Public Works and Water Management is responsible for the North Sea and the coast and undertakes the maintenance of the coastline and the water board is responsible for the flood defences. Both are to meet the existing standards and can be called to account before a court by the parties concerned, when any damage occurs.
4. The clear goals and standards offer less room for manoeuvring to the water management bodies, but this still leaves scope for a flexible implementation with concern for regional and local interests.
5. If local authorities do not cooperate sufficiently, the instruments are there to continue, although the starting point of the Water Act -rightly- is based on consultation and cooperation.
6. The Water Act awards an important supervisory role to the province, but supervision of the water safety policy is primarily in the hands of the water managing body. The province is responsible for the supervision of the primary flood defences. The case shows that a clear division of tasks and responsibilities promotes the progress of the project.
7. With regard to the coordination of the required implementation decrees the Water Act contains a coordinating regulation, which effects a considerably faster adoption and execution of all implementation decrees to be adopted. This (regulation) already existed under the Flood Defences Act for the construction and the improvement of the primary flood defences and was included into the Water Act and, on account of its importance, even extended.
8. A separate regulation for the compensation of loss resulting from administrative acts is not necessary any more, as the Water Act provides a uniform regulation on this topic.
9. The possibility to get all parties concerned involved in the process has been enlarged legally, also under the influence of European law (public participation in the Water Framework Directive, the Flood Risk Management Directive and the Marine Strategy Framework Directive and the implementation of the Aarhus Treaty -which treaty sees to public participation and access to the court- in European directives). The said possibilities were also implemented in the Water Act.
10. The level of legal protection has always been good in the Netherlands. Cheap and easy access to the administrative court may be regarded as an advantage in complex decision-taking processes, even when this is not always experienced as such. The case however shows that this actually works this way.

## 7. Conclusions

The project has been successful from a legal point of view. The reasons for this are:

- A clear goal (primarily safety, apart from that economic development). The provision of flood protection is a goal that is received positively by the citizens.

- A clear division of responsibilities between the central government, the province, the water boards and the municipalities
- A government organisation that performs its task seriously and adequately; there is no discussion with regard to the question whether the measures are actually necessary
- The decision-making process went well from a legal point of view, legal procedures were followed, the principles of sound administration (good governance) and the legal requirements regarding the way in which decrees come into effect were followed correctly. This among other things sees to:
  - The collection of relevant information, among other things through the drafting of EIA
  - The informing and soliciting participation of citizens and other parties concerned (businesses, municipality)
  - The modification of the plans where possible as a result of the views submitted (choosing the alternative that is most appealing to citizens, businesses and the municipality at a reasonable cost)
- Implementation of the plan in a way causing as little damage as possible, that is, during the winter season.
- Bringing compensation regulations to people's attention in advance and assisting them with the applications for compensation
- The appointment of an independent committee to judge on compensation requests.
- No hesitation to take measures due to fear of liability or of compensations
- There is a sufficient degree of legal protection, which has also been called upon. This makes it easier for citizens to resign to the measures to be taken
- The project served as an example for the tackling of other weak links. Therefore it was important that citizens could agree with the working method, so that they would not dig their heels in at the other weak links.
- The provinces and the municipalities were pleased with the money for their area/region, which created room for new investments

## **Flood Risk analysis case Noordwijk: 'weak links' along the coast**

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### **1. Introduction**

Reduction of the Flood Risk is one of the main goals of improving the flood defences in Noordwijk. Hence, part of the governance analysis of the 'case Noordwijk: weak links along the coast' has to be a Flood Risk Analysis.

In this part we will address issues that have to be answered in a flood risk analysis. The following questions will be addressed: What is coastal flood policy? What is the flood risk analysis framework in the Netherlands? Is there a real flood risk problem along the coast? And: do the alternative solutions in Noordwijk fulfill the safety gap? The contribution is based on existing literature.

### **2. Coastal flooding along the North Sea**

Noordwijk is part of the coastal protection system in the Netherlands, along the North Sea.. However, flooding from the North Sea cannot only happen in the Netherlands. In [1] an overview is given of Coastal Flooding strategies along the North Sea Coast, and the causes of flooding. We will follow

Coastal risk is defined as the probability of a natural, hazardous coastal event, multiplied with the consequences of such an event. The type of event commonly considered in coastal management is flooding. A related type of problem in this respect is coastal erosion. Coastal erosion is to be regarded from two perspectives. First, coastal erosion may be leading to the loss of land and intertidal area and associated economic and ecological values, warranting a separate coastal erosion risk assessment. Second, coastal erosion poses a potential threat to existing natural and man-made flood defence systems, e.g. by erosion of dunes or cliffs or by undermining flood defence systems. From the latter perspective, coastal erosion should be considered an integral part of flood risk assessment.

Floods from the sea can be caused by overflow, overtopping and breaching of flood defences like dikes and barriers as well as flattening of dunes/dune erosion. Land behind the coastal

defences may be flooded and experience damage. A flood from sea may be caused by a heavy storm (storm surge or tidal flood), a spring tide, or particularly a combination thereof. Especially waves can damage the flood defences, and special measures have to be taken to ensure the integrity of these structures. For an example of a wave attack at the coast of England: see figure 1.



*Figure 1. Waves pounding the sea wall at Walcott, UK, November 9 2007. Photo: John Giles / AP*

In [1] it is stated that a timely reminder of the ever present risk was the storm surge on 9 November 2007 which resulted in the highest water levels for 50 years along parts of the North Sea coastline and - in the Netherlands- led to the operation of a full scale dike watch for the first time in 30 years. The surge also caused considerable erosion at some Wadden islands and minor floodings in certain harbour areas. Storm surge barriers like the Thames barrier and Maeslant barrier were closed. In England, several hundreds of people were evacuated.

In the 20th century, major North Sea coastal floods occurred in 1916 (NL), 1953 (NL/UK/BE), 1962 (DE) and 1976 (BE). In total, the storm surges claimed over 2,500 lives in coastal flood plains and caused considerable psychological, economic and infrastructural damage (see table 2.3). Since 1976, no flood disaster from the North Sea has claimed lives.

Figure 2 shows a compilation of national and regional elevation data (Source:[1]). Within project Safecoast seven national and regional datasets have been accessed and referenced to match Normal Amsterdam Level (NAP). As shown, large stretches of low lying areas correspond with the deltas and estuaries of rivers such as the Thames, Scheldt, Rhine, Meuse, Elbe and Weser. Even so, elevation data is only one factor for assessing coastal flood risk. Water levels, presence and condition of flood defence measures, breach locations and breach growth rates, potential extent of a flood, potential damage and other factors are also important elements in flood risk assessments .

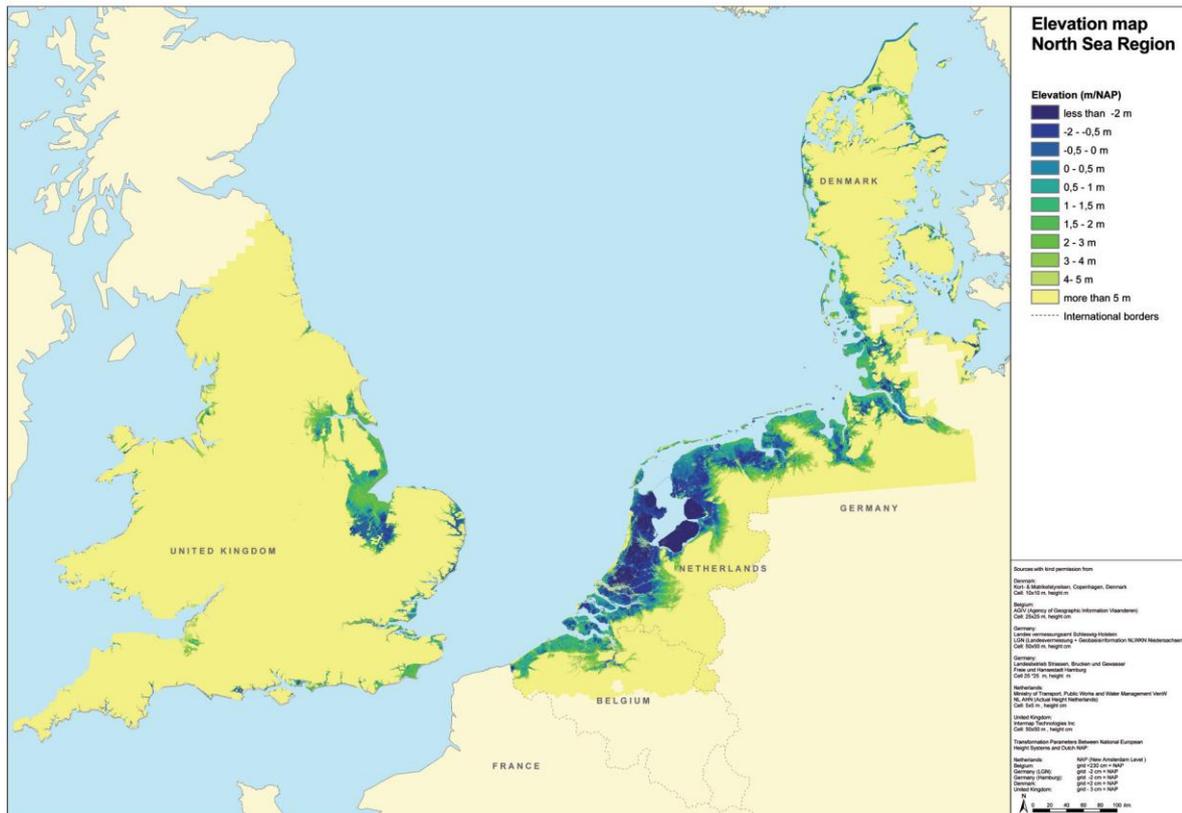


Figure 2. North Sea Region low lying areas [1]

Many countries have a safety standard in order to protect the country against flooding. The safety standard can be a flood risk (for example expected economic damage or loss of life), a flooding probability or an exceedance probability of the design hydraulic load. From a theoretical point of view, a standard in terms of flood risk seems the optimal way, because societal costs and benefits can be assessed in a consistent way. However, safety standards are defined nowadays as exceedance probabilities of the design hydraulic load, and these standards are based on a cost-benefit analysis. The exceedance probability can be seen as a proxy of the flooding probability, and in the new National Water Plan it is stated that new standards will be based on because the should. The Netherlands have a relatively strong safety standard, if compared with other safety standards. However, I think that the safety standard needs improvement, because of the growth of the economy, and hence floods will cause much more damage than 50 years ago when these standards were set. Comparing safety standards between countries is difficult. This is because of the various methods, models and underlying assumptions in monitoring, hydraulic boundary conditions, and design of flood defences. In many countries the risk based approach is currently studied and evaluated, although England remains unique having this approach embedded in decision making. Most safety standards in the other North Sea countries are based on (deterministic) design water levels for a certain frequency. However, the actual defence standard may be ascertained by its ability to withstand a certain hydraulic conditions or be based on a risk assessment or cost/benefit analysis approach.

### **3. Is there a safety gap along the Dutch coast?**

Why is Noordwijk a 'weak link' along the Dutch Coast? Basically, the protection against flooding in the Netherlands is part of the 'Wateract' (formerly the Act on Flood Defences, but since 2009 the Act on Flood Defences is integrated with other water acts). In the Wateract, it is demanded that flood Defences van withstand a hydraulic load with an average return period of 10.000 years (or, in other words, the flood defences have to withstand hydraulic loads with an exceedance frequency of 1/10.000 per year). In 2002, it was analysed that the hydraulic load along the Dutch Coast was stronger than previously estimated. Especially the wave period was expected to be longer. This resulted not in short of safety in the current situation, but with the expected climate change, it was expected that reinforcement was necessary. This insight does not automatically result in new policy, because also policy makers have to The 'Technical Advisory Committee on Flood Defences' advised the Minister to improve the Dutch coastal system.

It is important to note that Contrary to buildings and infrastructure behind the flood defences, which are protected through the Wateract (2009) (but originally the Flood Defence Act (1996)), buildings on or in front of the flood defences have no legal protection level with respect to coastal erosion or flooding. Therefore building investments are at the owners risk.

In the Dutch coastal towns pressure increases on the available space for living, working, recreation and mobility. At the same time sea level rise and associated higher and larger waves during extreme storms cause a higher probability of damage to buildings and infrastructure in coastal towns. The National Spatial Strategy (2005) explicitly mentions the coastal towns in relation to building on the flood defences.

### **4. The Noordwijk solution**

The technical problem in Noordwijk was that the dunes at the popular seaside town of Noordwijk were 1 metre too low over a distance of approximately 100 metres. The work to reinforce the range of dunes was carried out across a distance of about 3 kilometres. Across a distance of about 1 kilometre along the Wilhelmina Boulevard, a dike construction was hidden in the dunes. This construction results in dunes that are 50 metres wider and 1 metre higher (8.5 metres above the Amsterdam Ordnance Datum).

The technical solution of case Noordwijk is shown in figure 3. After an open design process it is chosen for the 'dike in dune' solution. This solution is solving the 'safety gap' and it fullfills the local interests.

## Dyke in the Dune

### 1 The old dunes are too narrow.

During a heavy storm, sand is washed away from the beach and the dunes. The old dunes are between 22 and 50 metres wide. In some places, this is not sufficient to cope with the effects of a heavy storm. There is a risk that the dunes will be washed away and the land behind will be flooded.

### 2 Wider dunes provide protection.

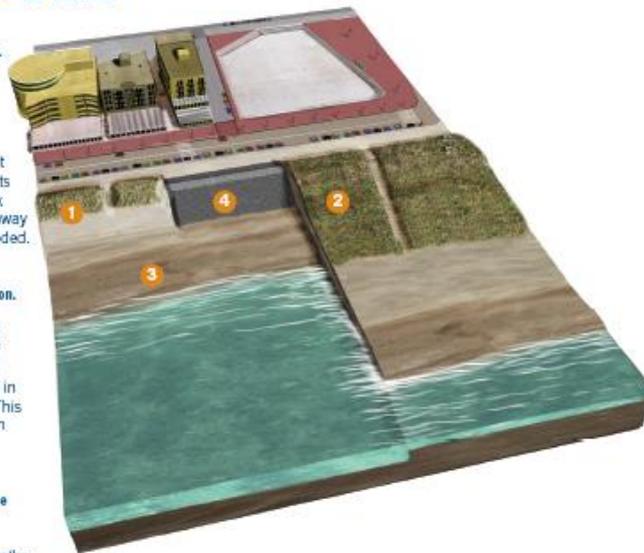
The new dunes will be widened by 42 metres in the direction of the sea. There will therefore be extra sand in front of Noordwijk in the form of dunes and beach. This offers adequate protection, even against heavy storms.

### 3 The beach will remain as wide as before.

When the dunes are widened in the direction of the sea, they will cover the present beach for a considerable distance. This means a new beach must be created in the direction of the sea, so that the width of the beach remains the same. Sand will be introduced to raise the coastline, on the beach and for 800 metres out to sea. The seabed will slope away at the same angle as in the old situation, so that the water gradually becomes deeper.

### 4 The dyke: a powerful second buffer.

The dunes form the first buffer during a heavy storm. If the waves break through these, there is a second buffer: the dyke. The top layer of the dyke is made of stone, which keeps the sand underneath it in place effectively. The dyke will therefore wash away less easily than the dunes.



### Time schedule

**September 2007**  
Rijnland will start work. A part of the beach closes.

**December 2007**  
Construction of new dyke completed.

**January 2008**  
Laying the new dunes and beach will commence.

**April 2008**  
Work completed. Beach open again.

### Facts & Figures

1,15 kilometres of beach to be reinforced.

1.500.000 m<sup>3</sup> of sand to be dredged from the sea.

40 number of people working on the project.

20 million euros that the project will cost.

10 the number of weak links on the coast.

50 the number of years that Noordwijk will be safe again.

Figuur 3. Overview of solution in Noordwijk

## 5. Conclusions

Noordwijk is one of the 'weakest links' along the Dutch coast. These links have a 'safety gap' because of an increase in the hydraulic load, in particular the wave period. It is remarkable that the safety gap is not questioned in public. The reasons for this is that

1. There was consensus in the Technical Advisory Committee (where scientists, engineers and bureaucrats from Ministries, provinces and waterboards work together) about the problem;
2. Local interests are incorporated in the design
3. The Ministry of Public Works and Watermanagement has budget to solve the 'safety gap'

## References

[1]. Safecoast (2008), COASTAL FLOOD RISK AND TRENDS FOR THE FUTURE IN THE NORTH SEA REGION, synthesis report. Safecoast project team. The Hague, pp. 136.



## **Economic analysis Noordwijk aan Zee**

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De door SEO (2006) uitgevoerde maatschappelijke kosten-bastanalyse (MKBA) voor de versterking zwakke schakel Noordwijk is een gedegen economische analyse. In de MKBA wordt het nulalternatief vergeleken met vier projectalternatieven. In het nulalternatief wordt de bestaande veiligheidsnorm losgelaten (niets doen). Dit betekent dat de projectalternatieven t.o.v. dit nulalternatief hoge kosten hebben (immers in het nulalternatief zijn de kosten nihil) en hoge baten (namelijk het wegnemen van het risico voor het achterland). De MKBA beantwoordt daarmee zowel de vraag of investeren in handhaving van de huidige veiligheidsnorm rendabel is en de vraag welke van de alternatieven het beste scoren. Als veiligheid voorop wordt gesteld, dan zijn de baten daarvan per definitie groter dan de kosten. De laatste vraag kan ook middels een kosteneffectiviteitsanalyse van de alternatieven worden beantwoord. De analyse gaat dus niet zozeer om een economische onderbouwing van aanpassingen in het waterbeheer onder onzekerheid, maar om het kwantificeren van kosten van projectalternatieven voor het behalen van een gegeven veiligheidsnorm.

Het meest opvallende is dat er zo weinig aandacht wordt besteed in de MKBA aan de verdeling van zowel baten, kosten als risico's gerelateerd aan de vier alternatieven over regio's, generaties en sectoren. Er is dus weinig aandacht voor het vraagstuk van de ruimtelijke en temporele schaalniveaus. Zo ondervinden inwonende van Noordwijk de nadelen van verloren uitzicht en overlast van de aanleg, terwijl de hoge baten –namelijk verminderde schade door overstromingen- vooral ten behoeve van het achterland zijn. De MKBA levert wel een positieve uitkomst op (wat in theorie betekent dat de winnaars de verliezers kunnen compenseren), maar dat wil nog niet zeggen dat iedereen daar gelukkig mee is (aangezien de kosten en baten ongelijk verdeeld zijn). Er wordt echter niet ingegaan op de voor- en nadelen per partij.

Ook wordt er niet gekeken naar de optimale timing van investeringen. De vraag is of de investeringen om aan de veiligheidsnorm te voldoen nu al nodig zijn en in de toekomst afdoende zijn. Er is namelijk nog betrekkelijk weinig bekend over de aard, omvang en snelheid van klimaatverandering. Ook is er nog weinig bekend over het effect van de bouw van de Tweede Maasvlakte.

Er wordt in de MKBA geen rekening gehouden met de mogelijkheid om adaptief te investeren, met andere woorden om een deel van de investeringen uit te stellen totdat er meer zekerheid is. Er is dan ook geen gebruik gemaakt van de real option theory (een geavanceerde methoden voor besluitvorming onder onzekerheid), waarbij in de berekeningen rekening wordt gehouden met de waarde van flexibel beheer. Adaptief

waterbeheer is wel een criterium waarmee bij de keuze van de alternatieven rekening is gehouden, maar dit komt niet expliciet in de MKBA terug. Zo is een dam in een dijk een minder flexibele oplossing dan een dijk in een duin, aangezien een dijk in een duin kan worden opgehoogd indien klimaatverandering dat noodzakelijk maakt.

De keuze van de discontovoet is weloverwogen. Toekomstige baten, in zoverre onzeker, zijn met 7% verdisconteerd i.p.v. met 4% (en tellen dus minder zwaar mee). De keuze van de discontovoet is relevant aangezien kosten van alternatieven vaak groot zijn en nu gemaakt moeten worden terwijl de baten ver in de toekomst liggen. Het gebruik van een lage discontovoet stimuleert dergelijke investeringen.

Tenslotte laten de hoge baten voor “mogelijkheden voor ruimtelijke ontwikkelingen” in de MKBA zien dat de combinatie kustversterking met gebiedsontwikkeling een goede aanpak is. Zo kan gedegen integraal beleid leiden tot aanzienlijke kostenbesparingen in het adaptatiebeleid.

### **Referentie**

SEO economisch onderzoek (2006) Maatschappelijke kosten-batenanalyse voor de planstudie versterking zwakke schakel Noordwijk