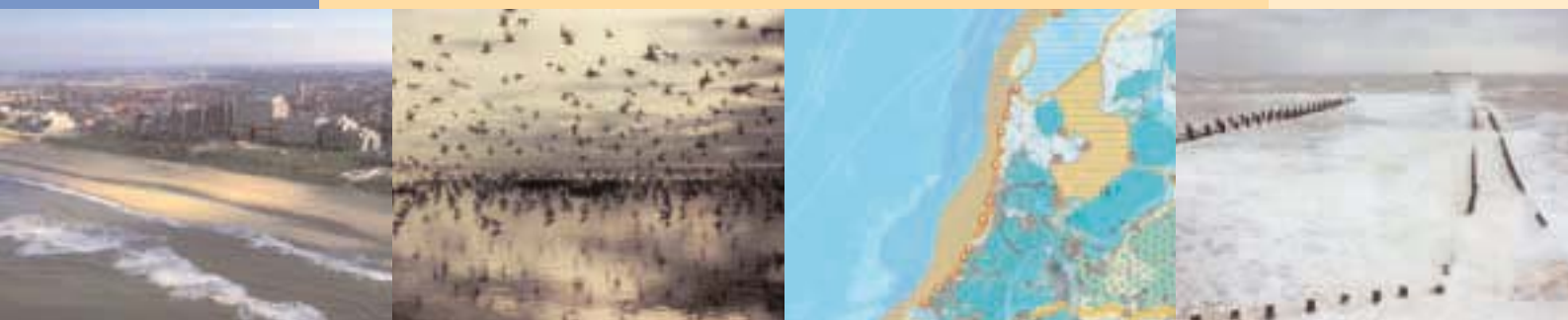


# Towards an Integrated Coastal Zone Policy



## POLICY AGENDA FOR THE COAST





# **Towards an Integrated Coastal Zone Policy**

## Policy agenda for the coast

Effective coastal policy is essential for a country dominated by deltas – like the Netherlands. The coastal zone is currently the setting for a myriad of – sometimes contradicting – developments. In 1999, the Ministry of Transport, Public Works and Water Management, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries, and the Ministry of Economic Affairs analysed these developments in the preliminary study *Kust op Koers (A Coastal Zone Perspective)*. The growing tension between rising sea levels and the pressure society is placing on the coast in particular present the government with a wide range of policy issues.

This policy agenda – *Towards an Integrated Coastal Zone Policy* – enunciates these issues. The integrated nature of this agenda is necessary since the policy issues require the involvement of the national government, provincial authorities, municipal authorities and water boards. As such, these parties must work together closely to address the challenges in a cohesive manner. In 2001, the European Commission presented the same recommendations, advocating integrated national frameworks and cohesive management at regional and local level.

*Towards an Integrated Coastal Zone Policy* outlines the policy issues and presents the national government's current train of thought. A national discussion among the parties involved will be organised on the

basis of this policy agenda, to which discussion government and administrative consultation bodies will contribute their recommendations.

At the end of 2002, these building blocks must result in a fully-fledged policy line for the coast. This will indicate the starting points for the plan study to mitigate the weak links in the coastal area and for risk management in coastal towns. Contours for integrated coastal zone policy will also be developed, for which – in accordance with the European recommendation – a national strategy must be ready by 2004/2005.

This policy document examines subjects of imminent importance, giving priority to safety policy. Nonetheless, we have intentionally defined the scope of coastal policy as broadly as possible, particularly in developing possible solutions to address future weak links in the Dutch coast, establish risk levels and effect quality boosts for coastal towns, and achieve a sustainable coastal foundation zone.

For this reason, I consider this policy agenda a first step towards the integration of policy and interests in the coastal zone. As such, it fulfils my plea in favour of innovating water management in the 21st century, in particular giving shape and content to coastal policy. For this, a number of essential conditions must be met with regard to time, financial resources, energy and – more importantly – co-operation and creativity.

**J.M. de Vries**

State Secretary of Transport, Public Works and Water Management

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## Summary

The coast is an attractive living, working and recreational environment, with substantial economic and environmental value. In the future, however, coastal defences will face a heavy battering from rising sea levels and an expected higher frequency of storms. The ability to combat these challenges requires space in the coastal zone, which space is being claimed by other functions. Moreover, the national government is undertaking the duty to guarantee the safety of the hinterland and maintain – and where necessary enhance – the spatial quality of the coastal zone.

The Dutch government resolved to publish a policy line for the coast in 2002. *Towards an Integrated Coastal Zone Policy* places the key challenges for the coast on the policy agenda and on the discussion table. The Dutch government will determine its position based on these discussions.

The policy agenda examines subjects of imminent importance, giving priority to safety policy. Nonetheless, we have intentionally defined the scope of coastal policy as broadly as possible, particularly in the chapters addressing the weak links, coastal towns, and coastal foundation zone. In addition, this policy agenda represents the next step towards integrated coastal zone policy.

As already stated, we will face a number of safety and risk problems in the near future. Topping the policy agenda are the **weak links in the coastal defences**, which must be mitigated in time to continue to guarantee **the safety of the hinterland**. This entails responding to such questions as: 'Which weak links merit priority in terms of safety and spatial quality?' and 'Is the national government, provincial authority or flood defence manager responsible for mitigation efforts?' The policy agenda presents a step-by-step plan towards a deliberation framework for the national government, in which safety and criteria for spatial planning feature prominently. The discussion must reveal whether the step-by-step plan offers sufficient direction for an informed choice regarding the location and layout of efforts to mitigate weak links.

In addition to the weak links, **risk management and quality boosts** present a challenge for **coastal towns**. Some parts of coastal towns are located outside the dikes, for which there are no legally stipulated safety standards. This policy agenda proposes offshore measures to maintain the erosion lines of the parts of coastal towns that are located outside the dikes. This involves preventing future development in the area that runs the risk of erosion during storm surges. In addition, the current level of erosion risk faced by areas outside the dikes will be maintained. Erosion line management is linked to measures to limit damage to new and reconstructed buildings that are located outside the dikes, but within the red contours surrounding coastal towns. As soon as the various tiers of governments involved have determined the red contours around coastal towns, the interim policy presented in the *Derde Kustnota* (Third Coastal Policy Document) will cease to be in effect. The desired quality improvements can be achieved within these contours.

As a follow-up to the *Vijfde Nota over de Ruimtelijke Ordening* (Fifth National Policy Document on Spatial Planning), the **coastal foundation zone** concept will be further elaborated. This concept illustrates the philosophy that sand is the basis of Dutch coastal defences and other functions in the coastal zone. This policy agenda proposes a three-pronged strategy to manage the coastal foundation zone. Sand must be moved by natural processes. If necessary, a temporary sand buffer will be placed to mitigate the weak areas of the coastal foundation zone. If this proves ineffective, artificial constructions will be built to retain sand on a local scale. A point of discussion involves the inland boundary of the coastal foundation zone: Should it be wide (reflecting the multitude of functions it serves) or narrow (for safety considerations)? To fulfil its role of protecting the low-lying areas of the Netherlands, the sand balance in the coastal foundation zone must be maintained. However, this

limits other functions. The national government must respond to the question of whether it should focus on the general restrictions laid down in the Third Coastal Policy Document or whether these require further refinement.

Another duty of the national government is to ensure **effective coastal zone policy and administration**. This policy agenda proposes to improve both the co-ordination and implementation of policy, including streamlining the consultation structures and use of administrative agreements and covenants.

As an extension of the flood awareness concept maintained in the river area, this policy agenda introduces the **storm surge awareness** concept. Insufficient knowledge of the safety and risk aspects among lower tiers of government and individuals often facilitates undesirable spatial developments. Furthermore, current policy takes insufficient consideration of nature management policy, despite applicable laws and regula-

tions. Successful implementation of coastal zone policy requires increased awareness of safety and risks. Proposals are being made with regard to communication, education and layout of the coastal zone.

Finally, the policy agenda places great importance on shaping **integrated coastal zone policy**. In this regard, the recommendations of the European Union serve as a good guideline. The policy line for the coast that has already been announced is seen as a step towards the continued integration of the inland and offshore areas of the coast, various policy fields and different functions of the coastal zone. The policy agenda stimulates the development of the national government's vision of the coastal zone, which is based on the basic qualities of the coast, viz. resilience, cohesion and horizon. The discussion with regard to the vision can serve as a key contribution to the further development of integrated coastal zone policy.





# Sustainable safety and spatial quality

**The Dutch coast is unique. This area – where land and water meet – attracts people, plants and animals. Each year, tens of thousands of people enjoy the excitement and variation of the sea and coastal landscape. The area serves a key economic function, encompassing tourism, port industries, bulb growing, water abstraction activities and fisheries. Several nature areas of international importance are located in this area, for instance, the Delta of the province of Zeeland, Wadden Sea coast and the dunes along the entire Dutch coast. As the hinterland lies so low, the dunes and dikes along the coast serve an important flood prevention function.**

These coastal zone functions compete constantly for the limited amount of space available. A number of developments are currently placing the coast under intense pressure from both the inland and offshore side. Coastal defences are being readied for a battering. The predicted climate change is accelerating sea level rise and can result in more frequent and stronger storms. At the same time, population and economic growth are causing coastal towns and built-up areas to expand. These developments limit the physical space available for other functions and for future efforts to reinforce the sea defence structures.

The government wants the space in the coastal zone to be used as efficiently as possible without endangering the hinterland. For this, the government must better integrate its coastal safety policy with the policy of other sectors. Consequently, coastal policy must address more than beaches and sea defence structures alone and include all areas that have a functional or cultural connection with the coast. Integrated coastal zone policy can achieve this desired policy cohesion.

More attention at European level, too, is being paid to the various qualities of coastal areas. This involves increased recognition of the fact that every coastal area has its own specific and frequently complex problems. For example, the crucial role the Dutch coast plays in safety is unique given the low elevation – below sea level – of the western part of the

Netherlands. To address the problems and developments in coastal areas in a cohesive manner, the European Commission recommends integrated management and policy for the coastal areas.

## **Towards an integrated coastal zone policy**

With the preliminary study *A Coastal Zone Perspective*, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries, the Ministry of Economic Affairs and the Ministry of Transport, Public Works and Water Management have taken a step towards a more integrated approach to the coast. *Towards an Integrated Coastal Zone Policy* represents the next step. This policy agenda was drafted in response to two concrete problems identified in the Third Coastal Policy Document (2000). Firstly, the weak links in the coastal defences must be mitigated. Secondly, there is a need for more clarity regarding the possible spatial development of coastal towns, which current interim policy lacks. This policy agenda serves as a step towards integrated coastal policy. This elaboration of national policy was also announced in the Fifth National Policy Document on Spatial Planning and the Tweede Structuurschema Groene Ruimte (Second Structure Plan for the Rural Areas).

This policy agenda is the result of close cooperation between the various tiers of government involved, including the Ministries, coastal provincial authorities, coastal municipal authorities and water boards. In the spring of 2002, a discussion will be organised based on this policy agenda, which together with the results of this discussion will serve as the building blocks for a policy line for coastal zone policy that focuses on the weak links and coastal towns.

## **The policy agenda...**

Towards an Integrated Coastal Zone Policy makes concrete recommendations for national policy, identifies the options for discussion and makes recommendations for the continued development of integrated

## *Document overview*

*Chapter 1 provides background information about the policy agenda and an outline for future policy. Chapter 2 presents a brief analysis of problems in the coastal zone and formulates policy issues. Chapters 3 through 8 elaborate these topics into concrete policy recommendations, which will be part of subsequent discussions.*

## Background and cohesion

*Towards an Integrated Coastal Zone Policy* is a logical next step in a number of initiatives regarding coastal zone policy and should not be considered a separate document. In 1999, the Ministry of Transport, Public Works and Water Management, the Ministry of Housing, Spatial Planning and the Environment, the Ministry of Agriculture, Nature Management and Fisheries and the Ministry of Economic Affairs published a preliminary study entitled **A Coastal Zone Perspective**, taking the first step towards a more integrated approach to coastal zone policy. This preliminary study was used to prepare various policy documents.

Following the large-scale floods that took place in the middle of the 1990s, the **Commission for Water Policy in the 21st Century**, at the request of the State Secretary for Transport, Public Works and Water Management and the chairperson of the Association of Water Boards, investigated whether Dutch water management is ready to deal with future climate change and rising water levels. The Commission concluded that this was not the case. It supported the course outlined in the Vierde Nota Waterhuishouding (Fourth National Policy Document on Water Management), viz. an approach that focuses on water systems and catchment areas, and treats water as an element of nature.

In the same year, the Dutch government's response was formulated in a document entitled **Anders omgaan met water; Waterbeleid in de 21e eeuw (Dealing with Water Differently – Water Policy in the 21st Century)**. This policy document focuses on technical measures and spatial reservations for water storage.

In respect of the coastal zone, the Dutch government concluded the following:

- There are a number of weak links in the sea defences that will require mitigation in the future. Spatial reservations must be made for this purpose.
- Mitigation efforts are already being carried out in accordance with an integrated spatial approach in the areas of Callantsoog – Den Helder, Hook of Holland – Kijkduin and the western part of Zeeuws-Vlaanderen in the province of Zeeland.
- Individuals are insufficiently aware of the 'water problem'. The Dutch government should inform them better of the nature and scope of the problems and risks.

The government position paper *Dealing with Water Differently* provided a basis for the **Third Coastal Policy Document**. According to this document, flood defence structures in areas with narrow stretches of dune and dike – potential weak links in the coastal defences – should be reinforced and widened. In addition, attention is drawn to

the higher risk of flood damage for coastal towns. Both subjects are included in this policy agenda, which also addresses integrated coastal policy and coast awareness.

In its **recommendation**, the **European Commission** has requested all member states to develop a national vision and strategy for **integrated coastal policy**. According to the EU, integrated policy focuses on sustainable safety, protection of natural ecosystems and socio-economic improvement. As Europe contains various types of coast, the member states are free to determine the main components of their national coastal policy. The Netherlands has opted for a concept that focuses on 'spatial quality and sustainable safety'.

The **Fifth National Policy Document on Spatial Planning** stresses the importance of integrated policy for the coast and the wetlands, which comprise part of the international delta. This will achieve more cohesion on a national level, in terms of the interests involved, associated fields of policy and plans formulated by the national government, provincial authorities, water boards and municipal authorities. According to the policy document, the national government is responsible for formulating integrated coastal policy and that implementation can only be effected through co-operation with the other tiers of government.

The **Second Structure Plan for the Rural Areas** announces that the government is preparing a coastal zone policy document both to comply with the EU recommendation regarding integrated coastal zone management and to address issues that will be important in the long term. 'The subjects in this policy document include spatial reservations for flood defence purposes and improvement of the general quality and accessibility of the coast.'

In their document entitled **Strategic Vision for the Coast 2050**, the provinces of Noord-Holland and Zuid-Holland proposed possible solutions to address weak links and spatial development in coastal towns. This policy agenda will take area-based solutions into account as much as possible. The preconditions that will apply to the implementation of regional plans should be determined as soon as possible.

Finally, there is a link to other projects that are currently being implemented, such as **Flood Risks and Safety in the Netherlands**. This project could provide insight into the chances and consequences of flooding, help enhance the prioritisation of flood defence improvement, influence current approaches to the prioritisation of efforts to address weak links and provide more insight into the safety of engineering structures and current safety standards.

coastal zone policy. As the problems primarily involve weak links and the spatial developments of coastal towns, the solutions in this area have been elaborated in greater detail than the solutions for risk awareness and integrated coastal zone policy.

This policy agenda emphasises the sand-based North Sea coast. This not only comprises the greatest share of the Dutch coastline, but also the area with the most urgent problems. Specific problems along the Westerscheldt river, Nieuwe Waterweg canal, Wadden Sea coast of the provinces of Friesland and Groningen, and Wadden Sea (as described in the Dutch government's *Derde Nota Waddenzee* (Third National Policy Document on the Wadden Sea)) are not specifically addressed, but do merit thorough discussion in the process.

The motto for this policy agenda is 'sustainable safety and spatial quality'. It embodies an agenda that, despite its focus on safety, expressly takes other functions into consideration, including nature, recreation, living and working. It represents a step towards integrated coastal zone policy, not the final destination. After all, the integrated Dutch coastal zone policy of the future will focus on 'spatial quality and sustainable safety'. Policymakers and other parties involved will do well to strive towards realising the goals represented by this motto.

#### ...and the policy line

The problems involving the coast will be addressed in three phases: an exploratory phase, a plan study phase and an implementation phase. This policy agenda can be considered a first nationwide exploration, in which the elements of the inter-ministerial preliminary study *A Coastal Zone Perspective* are elaborated. The exploratory phase results in a policy line. The information gathered at regional level will be used during this process, such as the *Strategische Visie Hollandse Kust 2050* (*Strategic Vision for the Coast of the Provinces of Noord-Holland and Zuid-Holland 2050*), completed in 2001 by the provinces of Noord-Holland and Zuid-Holland, and the coastal policy plan of the province of Zeeland, which is currently under development.

### Timeline for the coastal policy line

**February 2002** On behalf of the officials of the other ministries involved, the State Secretary for Transport, Public Works and Water Management publishes *Towards an Integrated Coastal Zone Policy*.

**Spring 2002** The contents of the policy agenda are discussed with various target groups, government authorities and consultation bodies.

**Summer 2002** Preparation of a reaction paper following discussions and consultations.

**Autumn 2002** On behalf of the officials of the other ministries involved, the State Secretary for Transport, Public Works and Water Management publishes the policy line, which is discussed in the Lower House of Dutch Parliament.

**2003** The coastal policy line takes effect.

The policy line includes the starting points for the plan study phase. The subjects addressed in the policy line include:

- determining the (decision-making) procedure and organisation of integrated coastal zone policy and how these are to be embedded in administrative agreements;
- delimiting the content of integrated coastal zone policy, including an integrated, nationwide strategy, with objectives, missions and guidelines with regard to the determination of phases, establishment of priorities and funding;
- stating a clear position with regard to development in the coastal zone with a view to replacing the interim policy put in place in 1997;
- establishing a plan to mitigate weak links in the coastal area, based on a deliberation framework established by the national government;
- establishing preconditions for risk management and quality improvements in coastal towns.

The policy line should take effect in the spring of 2003. The European recommendations for integrated coastal zone policy must be elaborated into a national strategy by 2004/2005.

# Opportunities and threats in the coastal zone

Coastal areas are characterised by a wide variety of values and interests. This certainly applies to the Dutch coast, which, as part of the sea defences, is essential for the safety and liveability of the Netherlands. In addition, it serves as an important nature area, encompassing some of the most valuable habitats in Europe. The socio-economic value of the coast is also considerable, serving as an area for living, working and recreation for individuals and as a workplace for companies active in tourism and fisheries. As such, the coast is a basic requirement for healthy economic and nature development. However, the presence of these functions results in both threats and opportunities.

## Sea level rise scenarios

The exact scope of the expected climate change is as yet uncertain. Depending on the term of the issue at hand, policy and management is geared to one of the following sea level rise scenarios\*.

### 'Low' scenario: 20 cm/century

This scenario is applied to take decisions regarding projects with a short design period (approx. five years), requiring limited investments and flexible solutions, such as sand replenishments.

### 'Median' scenario: 60 cm/century

This scenario is applied to take decisions regarding projects with a longer design period (50-100 years), requiring major investments and little flexibility, such as the construction of dikes and storm surge barriers.

### 'High' scenario: 85 cm/century and a 10% increase in wind

This scenario is applied to make spatial reservations for the purpose of flood defence.

This document applies a 200-year policy horizon in accordance with the Third Coastal Policy Document and the recommendations of the Technical Advisory Committee for Flood Defence Structures.

The 'high' scenario is used to determine the weak links.

\*These scenarios were taken from the Third Coastal Policy Document and are based on Intergovernmental Panel on Climate Change (IPCC) reports. They involve relative sea level rise, which means that the effects of soil subsidence have been taken into account.

## 2.1 Pressure on the coast

The coast is subjected to pressures from both land and, in particular, the sea. Sea defence structures must bear an increasingly heavy burden due to the impact of climate change. The impact of inland pressures, too, on the coast is growing. After all, the number of people living behind sea defence structures is increasing, involving higher levels of capital investments.

### Pressure from the sea – safety

Rising sea levels lead to higher average water levels and more frequent (storm-force) winds result in higher waves. Furthermore, storm surge levels and the difference between high and low tide continue to increase. Consequently, the pressure placed on sea defence structures, which protect the hinterland from flooding, is increasing.

All sea defence structures currently meet the current standard. In places where the dunes are sufficiently wide, the hinterland will face no danger in the future. However, the safety of the low-lying areas of the Netherlands will be in jeopardy in places where the coastal defences consist of narrow dunes or dikes. Sea defence structures that must be reinforced in the coming 200 years are considered weak links.

Although not every weak link must be mitigated in the near future, space must now be earmarked for them. This will prevent new developments from being set into motion that would hinder future efforts to reinforce sea defences.

Figure 2.1 presents an overview of the weak links along the Dutch coast. Chapter 3 describes the weak links that top the list for mitigation. In addition to safety, spatial quality plays a key role.

### Pressure from the sea – risk

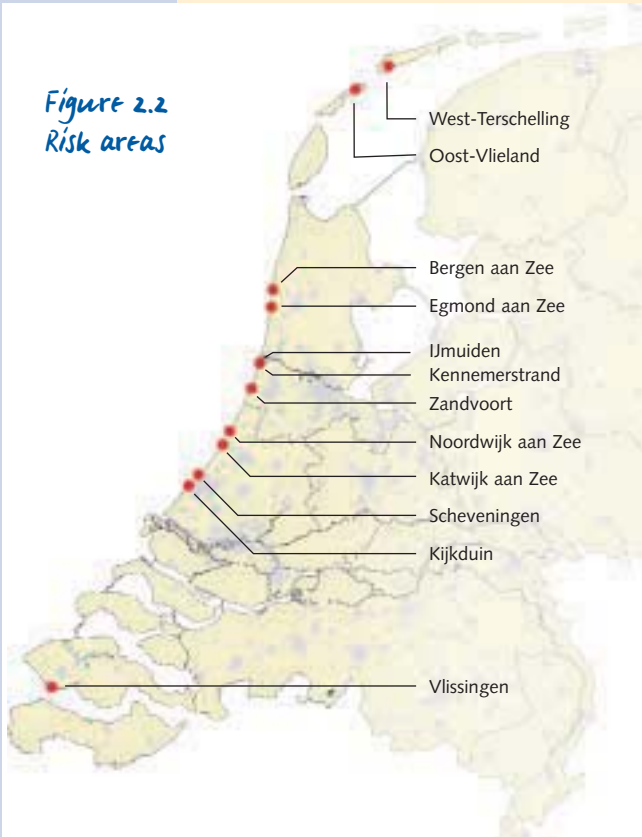
Safety standards apply to areas behind flood defence structures to minimise the risk of flooding. The government sees to it that these safety standards are maintained.

Figure 2.1  
The weak links



Weak links: areas in the Dutch coastal defences that need to be reinforced within the next 200 years

Figure 2.2  
Risk areas



Risk problem: seaside towns with buildings in the erosion zone.

However, people live, work and play in areas located in front of the flood defence structures, viz. on the beaches and in the dunes. This all takes place in what is known as the erosion zone – the area that erodes during storm surges.

No legally stipulated safety standards apply to this area. A lower level of safety applies to residents and buildings in the erosion zone than to those in the hinterland. Residents and project developers in this area bear the risk associated with it, as is the case in river areas outside the dikes. The difference is that buildings along rivers run the risk of (partial) inundation, while – in the worst-case erosion scenario – buildings in the coastal zone can disappear entirely.

Figure 2.2 indicates which coastal towns face this risk. An initial inventory demonstrated that several thousand individuals reside in the areas outside the dikes, who must be warned in a timely manner in the event of a storm. However, the material damage could be substantial.

This risk will continue to increase in the future. Not only does the risk of damage as a result of rising sea levels increase, so does the scope of damage. As the erosion lines will continue to shift landward, the erosion zone will encompass an ever-larger area. Substantial investments have already been made in this ‘new erosion zone’. As a result, the potential damage due to erosion increases.

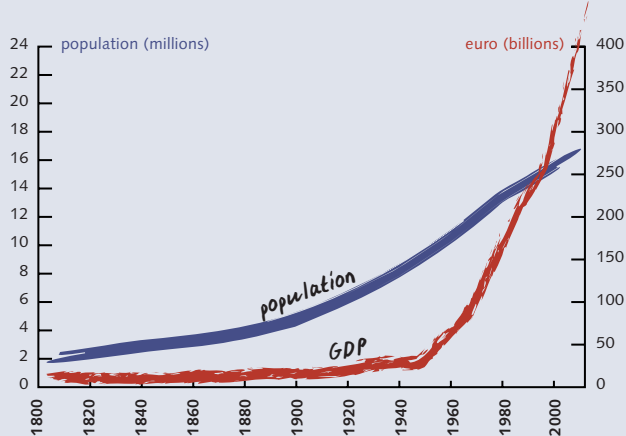
### Inland pressure

Inland pressure on the coast is also increasing. In the last 50 years, the Dutch population has not only increased considerably, but has also become more prosperous. The demand for housing and attractive living environments is increasing, which can be attributed to the fact that the number of people living on their own is increasing. The coastal zone fulfils both of these needs.

In addition, the need for more recreational opportunities, adventure, peace and space is growing. The coastal zone has a lot to offer in this regard as well. But the Dutch coast requires a quality boost to be able to

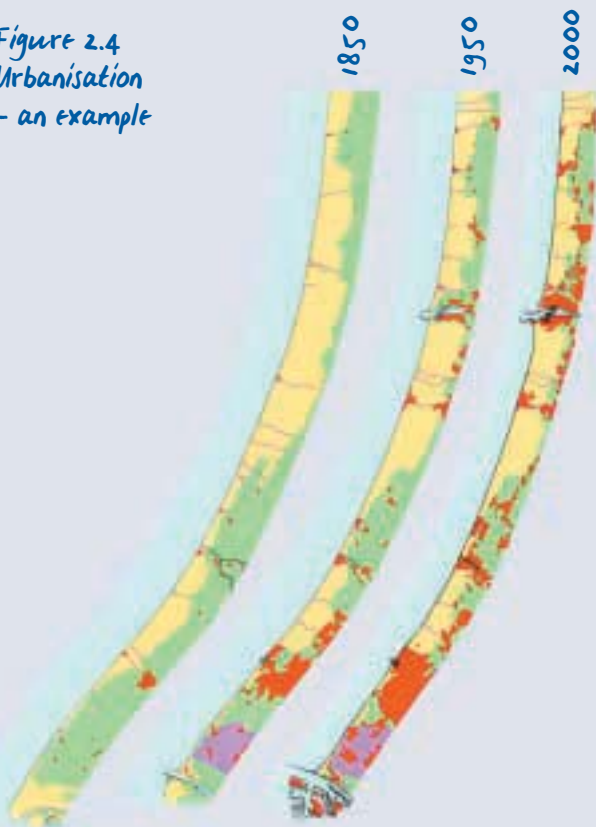
compete with international tourism. Coastal towns are hampered by the inability to innovate their product and their lack of a unique identity. For this reason, coastal towns are working more intensely to make a name for themselves and provide qualitatively better accommodations and facilities. For this, they require more space.

Figure 2.3 Growth of the Dutch population and GDP



Growth of the Dutch population and gross domestic product since 1880. The sea defences protect an increasing number of inhabitants and capital investments.

Figure 2.4 Urbanisation - an example



Growing urbanisation negatively impacts the flexibility of the coastal area, leaving less room for adjustments.

The Dutch coast is feeling the pressure of urbanisation from the Randstad conurbation. Recreational activities are placing a substantial burden on the Delta in the province of Zeeland and the Wadden Sea coast in particular. In these areas, the living and recreational functions must share space in a variety of combinations with industry and water abstraction efforts. The increasing pressure placed on space in the coastal zone presents a threat in a number of areas. These include:

### 1. Safety

Dwellings, recreational facilities and industry occurring on or behind primary flood defence structures hinder the ability to reinforce these structures in the future. Reinforcement is required over time to maintain the current safety standards in the face of rising sea levels. The Veiligheid van Nederland in Kaart (Flood Risks and Safety in the Netherlands) project of the Ministry of Transport, Public Works and Water Management is currently examining whether these standards need to be adjusted. There has been a dramatic increase in population growth and invested capital since the Delta Commission started developing these standards in the 1950s.

### 2. Dynamics

Built-up coasts are less flexible and have a limited natural ability to adjust. Once areas are built-up, people will want to protect them against the sea. As a result, the coastline at these locations no longer has the room to fluctuate. Compounding this problem is the fact that rising sea levels will only increase the burden placed on those locations. This phenomenon ('bulwark formation') threatens the resilience and dynamics of the coast, transforming it into a fixed boundary that requires a great deal of maintenance.

### 3. Nature and landscape

Economic growth in the coastal zone threatens environmental and landscape values. The Dutch coastal zone is also undergoing fragmentation; the spatial contrast between open and small-scale landscapes, and urban and rural areas is on the decrease. In many ways, the area has become less varied and less attractive. Buildings in the dune areas in particular have had a substantial negative impact on the quality of nature and landscape and the possibilities for natural dynamics.



'Bulwark formation' increasingly threatens the coast's resilience and dynamics, making it a fixed boundary.

### Example of a spatial demand

In the next 25 years, the tourism sector will need approximately 1,600 hectares of additional space in the Dutch coastal zone (source: TRN) to enable both the construction of new businesses and the expansion of existing ones. This space is largely being allocated to enable quality improvements to accommodations and recreational facilities. After all, guests appreciate the extra space.

*Hotels and pensions.* In the last decade, the surface area of the average hotel or pension room has increased by 20 to 25%, now measuring 30 m<sup>2</sup>. In this respect, businesses are simply responding to the growing demand for more luxurious hotels. If they want to remain competitive, they have to adapt their supply to changing demand.

*Camping sites and bungalow parks.* Tourists want more space for their tents and caravans. They take more and larger things with them. Campers also want more privacy. As a result, green spaces and facilities comprise a growing part of the entire gross surface area of these businesses.



### Policy issues

The pressure placed on the coast requires the national government to formulate a variety of policy issues, which will be addressed cohesively within the framework of integrated coastal zone policy. This policy agenda focuses on the most urgent policy issues in terms of safety.

#### Policy issue:

#### from weak links to a dynamic coast

**Measures must be taken to protect the hinterland. As a result, the weak links in the coastal defences must be able to withstand the rise in sea levels and more frequent storms expected over the next 200 years.**

This policy issue requires solutions that guarantee safety, but also promote spatial quality. A national, integrated deliberation framework is required to assess regional proposals for solutions. This is a job for the national government, which must also identify which weak links must be mitigated first. Where necessary, procedures, plans and funding must be elaborated. The long duration of plan studies – certainly with a view to integrated solutions – heightens the urgency of this policy issue.

With regard to the problems associated with risk, the policy issue is closely tied to

## Categories of safety issues

Four categories of safety issues can be identified in respect of the Dutch coast, two of which will be addressed in this policy document, viz. flood defence and risk management.

### Coastline maintenance

The number of sand replenishments and the quantities applied will have to increase to enable coastline maintenance and to enable the seabed, estuaries and Wadden Sea to keep pace with rising sea levels. An 85-cm sea level rise per century would probably require replenishments of 10 million m<sup>3</sup> of sand a year by 2100 (compared to the current 6 million m<sup>3</sup> of sand a year). According to current estimates, an additional 10 million m<sup>3</sup> of sand a year will be needed to compensate for losses in deeper water. Such replenishments are feasible.

### Wave overtopping

Wave overtopping may cause waterlogging in buildings situated on or behind the promenades. There are technical solutions to these problems.

### Flood defence

Safety behind the sea defences is guaranteed by flood defence structures that meet current safety requirements. However, the weak links found at a number of locations will eventually have to be mitigated.

### Risk management

Those who build, live and work in the area between the sea and flood defence structures do so at their own risk. Shifting erosion lines and the increasing likelihood of damage entail an increasing number of risks in the erosion zone. Several coastal towns have to cope with this problem.

Flood defence is an issue at other locations. In general, coastal towns are built on wide stretches of dune, eliminating any future threat to the hinterland. Only at Katwijk and Scheveningen are both flood protection and risks associated with the area between the sea and the flood defence structures significant. Parts of the sea defence structures in these areas need to be reinforced.

the necessity of giving coastal towns a quality boost.

### Policy issue:

#### **quality of coastal towns**

**Clear preconditions for safety and risk must be established for coastal towns. These preconditions must offer the towns a quality boost.**

The issue can be stated as 'building with value in the future' and is effective at regional level. This policy issue, too, is urgent. It requires clear statements from the Dutch government with regard to the acceptable risks (in the coastal zone in general and to coastal towns with a promenade in particular) and to the manner in which the national government can give a quality boost to coastal towns.

Finally, the coastal foundation zone must serve as the basis of the spatial layout of the coastal zone: the largely sand-based area required to guarantee the safety of the hinterland and optimise the other functions of this area.

### Policy issue:

#### **a sustainable national coastal foundation zone**

**The coastal foundation zone must be defined and embedded in legislation and regulations. In the long term, the sand balance in this coastal foundation zone must be maintained and, where necessary, restored.**

The Fifth National Policy Document on Spatial Planning clearly defines the offshore boundary of the coastal foundation zone as the line formed by the points lying at 20 metres below Amsterdam Ordnance Datum. However, the inland boundary of the coastal foundation zone can be defined as narrow (as in a flood defence structure) or wide (as in the flood defence structure and the area behind it). Once the coastal foundation zone has been defined, the Dutch government must also clearly enunciate the requirements for this zone. Since 2001, dynamic maintenance of the coastal foundation zone pays particular attention to the preservation of sufficient sand buffers in deep and shallow waters, including the Dutch coast, Wadden Sea coast and Westerscheldt river.



## 2.2 Administration and policy

Administration, policy and coastal zone management is the responsibility of the various tiers of government and administrative bodies. Each has its own specific tasks and legal provisions to implement them. This sector-based approach results in the following bottlenecks.

### Policy co-ordination and implementation

It often takes a lot of time to integrate national policy into provincial and local policy, and once this is done, it is usually insufficient. This is largely a consequence of a lack of clear coastal policy. The various ministries attempt to address the use of space in the coastal zone based on their own interests.

The problems associated with a lack of cohesion between the various policy fields come to a head at regional and local level. The various tiers of governments can interpret policy in different ways. One management body or municipal authority may be stricter than the other. Consequently, it is possible that the lack of space around and behind sea defence structures will increase, including locations where space is needed in the future to reinforce the flood defence structures.

Policy tools from the various tiers of government, too, are often insufficiently co-ordinated. This applies to such matters as issuing permits during the planning phase of a flood defence structure. Both the municipal authority (zoning plan) and the water board (water authority bye-law) must issue a permit for such plans, but mutual co-ordination is not optimal. Spatial plans, water authority bye-laws and pre-cept documents from the water boards must be better co-ordinated to prevent irreversible developments.

In addition, there is a lack of effective enforcement instruments. If the national government determines that issuing a certain permit is not in line with policy or legislation, recourse can in some instances be taken to the courts. However, provincial authorities are entitled to intervene directly, for instance by annulling the decision of a municipal authority or water board. Both cases, however, are rather drastic and place a substantial strain on administrative relations, which is why these enforcement options are very rarely used.

Policy co-ordination and implementation are urgent problems, since spatial plans involve a horizon exceeding a decade. It is possible that it will be years before new coastal policy is laid down in legal provisions. In addition, all tiers of government more frequently face international legislation, including the EU recommendations for Integrated Coastal Zone Management and the Bird and Habitat Directive. This, too, demands effective mutual policy co-ordination and implementation.

### Responsibilities and liability

The Wet op de Waterkering (Flood Defence Act) stipulates standards for the safety of the hinterland. The responsibilities in this area are clear: flood defence managers must see to it that flood defence structures meet these standards, while the national government must see to it that the basic coastline is maintained.

There is a lack of clarity with regard to the areas outside the dikes – in the erosion zone – for which no legal safety standards apply. Individuals and administrators are left to wonder who is liable for damage

### Administrative responsibilities

	Flood defence structure	Spatial planning
National	Ministry of Transport, Public Works and Water Management	Ministry of Housing, Spatial Planning and the Environment
Regional	Provincial authorities	Provincial authorities
Local	Water boards	Municipal authorities

*In some instances, existing legislation provides for the co-ordination of administrative responsibilities. Section 7 of the Flood Defence Act determines which interested parties should be involved in flood defence structure activities. In addition, the Spatial Planning Decree as referred to in Section 10 prescribes consultations between spatial planning bodies and water management bodies in the preparation of zoning plans.*

caused by storms. This question only becomes more urgent as the erosion lines shift landward due to rising sea levels.

A clear delineation of responsibilities and liability is necessary for both the current and future area outside the dikes. To this end, the acceptable levels of damage and risk must be determined. This ties in with the larger discussion of acceptable risks, which plays a role in a variety of areas of government administration.

#### **The policy issue**

All these areas of concern underscore the necessity to co-ordinate administration and policy effectively. The first steps have already been taken. In recent national policy documents (such as the Third Coastal Policy Document, Fifth National Policy Document on Spatial Planning and part 1 of the Second Structure Scheme for the Rural Areas), as much as possible was done to co-ordinate the policy intentions for the coast. Most of the provincial authorities have begun to establish (inter)provincial coastal visions in consultation with the national government, municipal authorities and water boards. Co-operation between the municipal authorities and flood defence managers has intensified, as a result of which the co-ordination of zoning plans, water authority bye-laws and precept documents is increasing. The next step requires that the national government address the following policy issue.

#### **Policy issue:**

**effective policy and administration in the coastal zone**

**The objectives of national and provincial policy must be co-ordinated as well as possible and integrated into the administration and policy of the administrative bodies involved. For this, a clear delineation of responsibilities and liability is required.**

This policy issue necessitates clear policy and clarity with regard to the mutual responsibilities. The policy must take into account the international context of coastal policy and the opportunities for regional tailoring. This is a long-term policy issue, but the Dutch government is already talking about possible adjustments and/or

amendments to legislation and regulations or changes to the administrative organisation.

### **2.3 Raising awareness and communication about the coast**

In many ways, the Netherlands is highly 'coast aware'. The awareness of the specific values of the Dutch coast, including the environmental, landscape and recreational value, is high, as demonstrated by the popularity of the coast as a living and recreational area. However, people are less aware of the consequences of this popularity, since developments in the coastal zone occur gradually and in small steps.

Over the long term, it is easy to see that the originally natural and resilient coastal areas are becoming increasingly developed and that such values as peace, space and horizon are on the decrease. This impacts nature, certain types of recreational activities and the ability to maintain coastal safety. Developing the coast to benefit one function has both short and long-term consequences for other functions, which is why there should be awareness of the interrelation of the various functions. This policy agenda focuses primarily on how these spatial developments impact coastal safety and on the necessity to raise awareness of the risks of flooding and damage from storms in the coastal zone.

Even with a rational awareness of the risks, they can often seem quite theoretical. Ironically enough, coastal safety policy is itself to blame. If, once a decade, a heavy storm should strike the Dutch coast, erode an area of coast and cause heavy damage to the ports and promenades located outside the dikes, while narrowly avoiding flooding, awareness among individuals and various tiers of government of the risks of living, working and playing in the coastal zone would probably be guaranteed. However, the flood defence structures have been designed to withstand a 10,000-year storm (provinces of Noord-Holland and Zuid-Holland), a 4,000-year storm (Delta in the province of Zeeland, island of Texel and provinces of Friesland and Groningen) and a 2,000-year storm (remaining Wadden Sea islands).

## What will it take to weather a major storm?

The chances of a fatal storm ravaging the Dutch coast seem negligible. Sea defence structures along the Dutch coast are required to withstand water levels associated with 10,000-year storm. The annual chance of such water levels occurring is 0.01%. By extension, a person who lives to 100 has a 1% chance of experiencing such a situation. This is a very small, yet very real chance, which is always present. After all, it might happen tomorrow.

The chances of such extreme water levels occurring are small since several factors would have to combine to create a 'major' storm. Extremely high water levels are the result of a particular combination of events relating to the tide and wind surge. At spring tide, even moderate wind surge can be dangerous. The strength of the wind surge depends on the power, duration and direction of the storm. They are highest during a northwesterly storm.

Obviously, the Netherlands is aware that the sea has been a threat throughout history. People may even know that the sea has (repeatedly) engulfed parts of Egmond and Ter Heijde. But most believe that that is all in the past. Faith in the engineering solutions taken since 1953 is high. This feeling of safety is also reflected in the investments worth billions that have been made in coastal areas over the past decade in hotels, dwellings, industry and infrastructure. Furthermore, the explosive growth in coastal development is long from over – many plans still await implementation. The awareness of the safety and risk aspects remains limited due in part to the lack of government action in response to development in areas outside the dikes that takes place without a permit.

### Example: What would it take for a storm to pose a threat to the sea defence structure at Hook of Holland, which is able to withstand 10,000-year storms?

- I Taking the water levels occurring during the storm of 1953 as a baseline situation, we can conclude that the flooding would have been prevented using current flood defence structures.
- II As a result of **rising sea levels and soil subsidence** since 1953, water levels would now be approx. 20 cm higher during a similar storm.
- III With a slightly **higher spring tide** and a slightly more **unfavourable wind direction** than that of 1953, water levels would rise by another 75 cm.
- IV A **4% increase in the intensity of the storm** would cause water levels to equal current safety standards.
- V A **10% increase in the intensity of the storm** would cause water levels to exceed current safety standards by approx. 40 cm, which could cause flooding in the hinterland.

Water levels (metres above Amsterdam Ordnance Datum)	Compared to present safety standards
3.85	-1.20 (still safe)
4.05	-1.00 (still safe)
4.80	-0.25 (still safe)
5.05	equals safety standard
5.45	+0.40 (dangerous)

As the time at which high tide occurs along the coast differs, worst-case scenarios would not result in maximum water levels occurring everywhere. These levels only occur if high tide coincides with maximum wind surge. This happened in the delta of the province of Zeeland in 1953, but not in the Wadden Sea, where water levels were not extreme.

The 1953 storm was the severest ever measured in the Netherlands and has been rated as a 350-year storm. Based on storm reports of previous centuries, an attempt was made to determine the water levels that occurred during flooding that took place on All Saint's Day in 1570, for example. Estimates range from levels associated with a 1,500-year storm at Scheveningen to those associated with a 4,000-year storm at Zijpepolder.

Rising sea levels and an increasing frequency of storms demand reinforcement of sea defence structures and heighten the importance of 'storm surge awareness'. In looking for integrated solutions, which optimally co-ordinate safety and other user functions, the various tiers of government and individuals must participate in close consultations. Coastal safety policy involves a policy horizon of 200 years, a period of time that exceeds the time frames within which individuals, investors, municipal authorities and provincial authorities think and act. There is often little understanding and support for the solutions and restrictions from the national government.

### The policy issue

True awareness of the risks of storm surges among all parties involved increases the support for and accelerates implementation of safety measures.

#### Policy issue:

#### awareness and communication

**More effective, strategic communication is necessary to raise awareness of storm surges among individuals and government. Increased awareness benefits the elaboration of other policy issues.**

### 2.4 Towards integrated coastal zone policy

Provided that the flood defence function and spatial quality of the coast are not jeopardised, the coastal zone offers good opportunities for continued development. For this, the available, highly valuable space must be used wisely. Currently, space is often not used optimally, for instance, an area is reserved for a single function, while several functions are possible. There are also situations in which space has been allocated for functions when safety considerations do not allow this.

#### Spatial quality

Integrated spatial policy is required to combine functions optimally and responsibly. This policy should focus on sustainable spatial quality, while maintaining safety. Individuals, entrepreneurs, local and regional authorities and the EU are more

frequently and more expressly asking the national government to develop such integrated policy.

Now that climate change requires space in the coastal zone, the national government must seize the opportunity to incorporate spatial quality as a key policy objective in integrated coastal zone policy. The EU recommendations for integrated coastal management and the interministerial preliminary study A Coastal Zone Perspective serve as starting points for this. These documents identify the three basic qualities of the Dutch coast: resilience, cohesion and horizon.

#### The policy issue

'Safety with an emphasis on spatial quality' is an effective and feasible objective, provided that this is further elaborated. Otherwise, this objective will go no further than statements that everything is interrelated and that all the interested parties must consult with one another. Developing and implementing truly integrated policy demands clear priorities, choices, responsibilities and instruments that apply to both inland and offshore areas.

#### Policy issue:

#### underway to integrated coastal zone policy

**The national government must give shape to the follow-up process towards integrated coastal zone policy and the initial steps that need to be taken.**



# From weak links to a dynamic coast

Measures must be taken to protect the hinterland, which enable the weak links in the coastal defences to withstand the rising sea levels and higher frequency of storms expected in the coming 200 years.

Although the policy issue for the weak links is of national importance, it is being elaborated at regional level for each weak link. This requires a single, uniform deliberation framework that takes both safety and spatial quality into consideration. These coastal areas are not only weak in terms of safety, but also spatial quality, particularly with regard to nature and recreation. In improving the weak links, we must also work towards increasing general spatial quality. Offshore solutions frequently offer excellent opportunities for new developments in the coastal zone. In certain instances, an inland solution or a combination of the two is preferred.

This chapter presents a proposal from the national government for a deliberation framework with conditions and criteria that it and other tiers of government must take into consideration in developing plans. The deliberation framework is embedded in a phased process that will apply to each weak link. This process comprises an exploratory phase, a plan study phase and an implementation phase. In addition, there are six decision moments in the process.

## Exploratory phase

The exploratory phase comprises an assessment of the value and necessity of mitigating a weak link in terms of both safety and spatial quality. This can occur at national level (in this policy agenda) or at regional level (including the Strategic Vision for the Coast of the Provinces of Noord-Holland and Zuid-Holland 2050 from the provinces of Noord-Holland and Zuid-Holland). At national level, the exploratory phase began with the Third Coastal Policy Document (**decision moment 1**), which announced a plan to elaborate a national project addressing the need for space for potential weak links. The exploratory phase results in

## Exploratory phase

Decision moment 1: Delimitation decision

Decision moment 2: Plan study decision

## Plan study phase

Decision moment 3: Choice of location

Decision moment 4: Improvement plan

Decision moment 5: Implementation decree

## Implementation phase

Decision moment 6: Completion and acceptance

*Weak links will be mitigated in accordance with a phased plan, including several decision moments. This is comparable to the process used within the Spelregelkader Natte Infrastructuur Projecten (Rules of the Game for Water Infrastructure Projects).*

the establishment of priorities, which indicates the period of time during which the weak links must be improved.

If a coastal section can be characterised as a weak link over time, this does not necessarily mean that it will be mitigated immediately. Two considerations figure prominently in determining the priority of a weak link: safety and spatial quality.

## Safety

The major question with regard to safety is how soon the legal safety level for the hinterland will be endangered. In responding to this question, we must distinguish between dunes, dikes and engineering structures (including sluices) and flood defence networks (including the dams in the province of Zeeland).

How soon the legal safety standards of **dunes** will be endangered depends on the current volume of sand. If sea levels rise and the wave climate becomes more extreme, the erosion lines will shift land-

ward. The volume of sand determines how far – and consequently over which distance – erosion lines can shift without threatening the safety of the hinterland. For this reason, the erosion lines for all dunes along the Dutch coast have been calculated for the next 50, 100, 150 and 200 years. Dunes for which the safety level cannot be guaranteed over the next 50 years are given priority.

In general, the construction and maintenance of **sea dikes** assume a life span of 50 years, taking into consideration the consequences of climate change. Prioritisation of sea dikes is based on the remaining life span of a dike (based on the last dike reinforcement) in connection with more extreme water levels and wave loads. As the life span never exceeds 50 years, all sea dikes are by definition a weak link with high priority. The 5-yearly testing rounds outlined in the Flood Defence Act provide a good basis to determine which dikes should be reinforced first.

The remaining life span of **engineering structures and flood defence networks**, too, is decisive, though in this case, the expected life span is 100 years. These are not given priority. Exceptions to this are the sluices at IJmuiden and the Brouwersdam, which have a life span of 50 and 50 to 100 years, respectively. The sluices at IJmuiden are considered a priority weak link. The Brouwersdam, however, requires a more detailed investigation of the remaining life span.

#### **Spatial quality**

Safety and spatial quality are closely inter-related interests in the coastal zone. This

sometimes leads to problems, for instance, irreversible investments directly in front of, behind or in a weak link area, involving permanent buildings, industrial estates or recreation concentration points. The inter-related nature, however, presents an opportunity to kill two birds – safety and spatial quality – with one stone.

The Fifth National Policy Document on Spatial Planning and part 1 of the Second Structure Scheme for the Rural Areas identify coastal sections that are weak in terms of nature, landscape and recreation. These areas require a rigorous ecological, cultural, historical and recreational structure, a qualitatively better coastal landscape, more diversity with regard to recreation and tourism, more spatial quality in coastal towns and improved infrastructure.

If regional initiatives are underway for a potential weak link, safety and spatial considerations reinforce prioritisation. Weak links that can be tied to a regional initiative will be given priority. For this reason, the following coastal sections have been given the highest priority: western part of Zeeuws-Vlaanderen in the province of Zeeland, Hook of Holland – Kijkduin and Den Helder – Callantsoog.

More specifically, dunes and sea dikes should be given priority in terms of spatial quality when:

- they comprise a weak area in terms of nature, landscape or recreation;
- their reinforcement can be tied to a continuing or starting regional initiative;
- they involve the three priority coastal areas identified by the Dutch government, viz. western part of Zeeuws-Vlaanderen in the province of Zeeland, Hook of Holland – Kijkduin and Den Helder – Callantsoog;
- they are located in an area for which national policy is already or will be underway (for example, if the area involves a national landscape).

#### **Prioritisation**

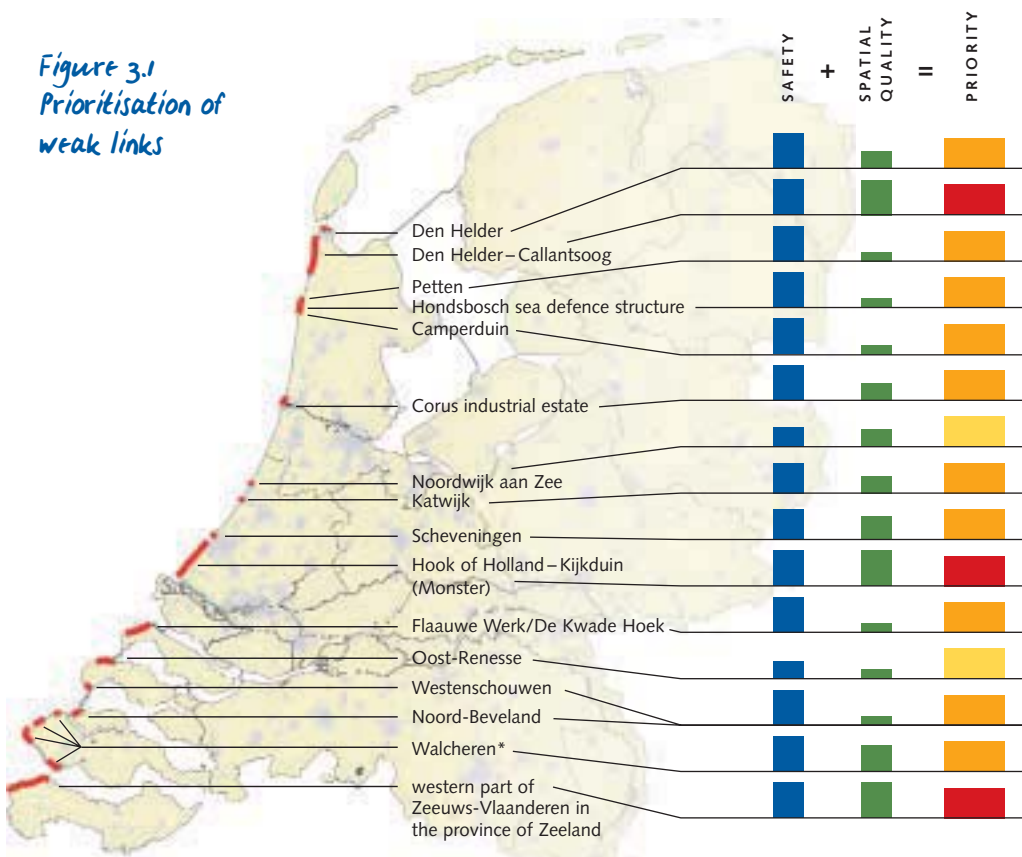
The prioritisation of all Dutch coastal sections is based on the safety and spatial quality prioritisation scheme above. As both safety and spatial quality must be taken into consideration, several weak links

### **Seven spatial quality criteria**

- 1 Spatial diversity
- 2 Economic and social functionalities
- 3 Cultural diversity
- 4 Social equality
- 5 Sustainability
- 6 Attractiveness
- 7 Human scale

Source: Fifth National Policy Document on Spatial Planning

Figure 3.1  
Prioritisation of  
weak links



**Safety:** To be reinforced in:

- 0-50 years
- 50-200 years

**Spatial quality:** Priority:

- very high
- high
- medium

**Weak link priority:**

- very high
- high
- medium

\* Walcheren comprises four weak links:  
(from north to south):  
Vrouwenpolder, Domburg,  
Westkapelle and Vlissingen

that do not necessarily need to be improved immediately in terms of safety, are nonetheless deemed a high priority. The priority for mitigating weak links (Figure 3.1) is based on the moment at which the measures must actually be taken. In some cases, the plan study will probably have to be started much earlier since the social processes involved can take a long time. Space is already being earmarked for weak links.

#### End of the exploratory phase

The exploratory phase ends with a plan study decision, enabling the transition to the plan study phase (**decision moment 2**). For the three weak links identified in the Fifth National Policy Document on Spatial Planning, the national government assumes responsibility for the plan study. For the other weak links, the provincial authorities are responsible for the initiative.

#### Plan study phase

Once the decision has been taken to mitigate a weak link, the space needed can be acquired in one of three ways, viz. expanding the sea defences landward, seaward or a combination of the two.

For these alternatives, the financial and legal-administrative consequences and the possibilities for compensation for the loss of ecological values or economic continuity must be mapped out. Where applicable, the current procedures, including an environmental assessment, are applied. This policy agenda does not include a detailed discussion of the procedures already in place.

The national government has laid down a specific deliberation framework (c.f. page 23) to assess the safety and spatial quality consequences in an integrated manner. This deliberation framework proposes no new policy, but translates existing policy into concrete criteria, which the alterna-

## A national programme

In most cases, the provincial authorities will take the initiative to mitigate weak links. However, three of the five weak links have been included in the implementation programme of the Fifth National Policy Document on Spatial Planning, viz. western part of Zeeuws-Vlaanderen in the province of Zeeland, Hook of Holland – Kijkduin and Den Helder – Callantsoog. Being the party responsible for coastal safety and given the importance to the national ecological network of mitigating these weak links, the national government serves as both initiator and director of the programme.

Together with the local authorities of the areas involved, the national government develops area-based visions and plans as part of three separate projects. The boundaries of the weak links must be delineated in regional plans and zoning plans no later than 2005. In 2006, an integrated improvement plan will be drafted for each area, determining where mitigation is needed, establishing the spatial demand and the future layout of the area, and assessing which projects and measures will be required.

Under the responsibility of the four ministries involved, the provincial authorities will prepare these plans. A key role is accorded to the Ministry of Transport, Public Works and Water Management. The provincial authorities bear responsibility for regional project organisations, offer advice regarding possible solutions and arrange for the necessary spatial reservations. The results of the programme will be assessed using the deliberation framework described in this chapter. The programme will be implemented from 2006 to 2010.

Source: Implementation programme of the Fifth National Policy Document on Spatial Planning.

tives must meet. The criteria are an elaboration of two central objectives of national policy: maintaining safety and reinforcing spatial quality with an emphasis on nature, landscape and recreation.

In all cases, the national government supervises the progress of the deliberation framework. The party taking the initiative for weak link mitigation activities (the national government itself, provincial authority or water board) adjusts the deliberation framework accordingly.

### Choice of location

Based on the considerations, a location is selected for offshore or inland reinforce-

ment, or a combination of the two (**decision moment 3**). The national government takes decisions regarding the three priority weak links identified in the Fifth National Policy Document on Spatial Planning. For the other weak links, the provincial authority proposes an alternative after running through the deliberation framework process. In these cases, the national government tests whether the deliberation framework process was properly implemented and has final approval of the proposal. The other procedures, such as environmental assessments and cost-benefit analyses, too, must be completed.

The provincial authorities draft an integrated improvement plan, describing the projects and measures required to mitigate the weak link. This plan describes the future spatial layout of the area and the possible combinations of functions in the plan. The improvement plan rounds off the plan study phase (**decision moment 4**). The extent to which the plan is supplemented in an integrated manner depends on what immediately motivated the reinforcement effort: safety or spatial quality considerations. In both cases, they must meet at least the safety and spatial quality requirements established by the Flood Defence Act and the Fifth National Policy Document on Spatial Planning.

Whenever the provincial authority has not decided on an approach to a weak link, even though tests demonstrate that the flood defence structure requires it, the flood defence manager will take the initiative to reinforce it. Using the Flood Defence Act as a basis, the manager drafts a reinforcement plan, about which he will consult with the municipal executives involved and with the provincial executive (Section 8). In this case, too, the three phases mentioned above must be completed.

### Implementation phase

The improvement plan is completed with an implementation decision (**decision moment 5**), which earmarks the necessary financial resources. Implementation can begin with this decision. The final result is the completion and acceptance of a stable link in the coast (**decision moment 6**).



## Weak link deliberation framework

Mitigation options (offshore, inland or a combination of the two) are assessed using the following criteria:

### Safety assurance

Weak links must be mitigated in such a way as to assure the continued safety of the hinterland. Any developments or events that could hinder these reinforcements should be avoided. For this reason, spatial reservations laid down today should take into account the effects of 200 years of rising sea levels. This also applies to flood defence structures that do not qualify as weak links. Building is not permitted in reserve buffers.

### Future developments

Weak link layout options should involve *no regret* measures and a phased approach, so as to anticipate future (social) developments. Even when offshore reinforcements are opted for, inland spatial reservations should still be made so as not to exclude the possibility of future inland reinforcements.

### Maintaining the sand balance

Sand should serve as the starting point when taking decisions about spatial measures to be implemented in the coastal area. In accordance with the three-pronged strategy described in Chapter 5, this entails:

- allowing sand flow as much as possible;
- compensating the lack of sand by constructing sand buffers;
- retaining local sand, using artificial constructions as a last resort option.

One of the implications of this strategy is that preference is given to sand-based solutions. Artificial offshore constructions are only permitted if there is no alternative. Finally, the relation with adjacent coastal sections should be mapped out.

### Environmental regulations

Proposed layout measures should be assessed on the basis of currently applicable environmental protection regulations, viz. the Bird and Habitat Directive, regulations applicable to the national ecological network and the *Natuurbeschermingswet* (Nature Conservation Act). The effects and compensation possibilities of each option should be assessed in advance. Proposed measures should contribute to the diversity of ecosystems and ensure the protection of nature as much as possible.

### Ecological quality

If possible, measures should improve the national ecological network, particularly when it comes to the creation of dynamic nature areas and the restoration of ecological corridors. Subject to preconditions imposed by safety considerations, natural processes should be encouraged and a dynamic green matrix should be aimed for. Nature improvement should be carried out in accordance with societal demands, and consist of variations between intensively used areas and areas of guaranteed peace and quiet.

### Optimal use of space

The coast is part of the national ecological network, which means that economic functionality is an important criterion for spatial quality. There should be harmony between the various functions and wasted space should be avoided. In the areas outside of the primary flood defence structure, the use of the possibilities for multifunctionality should be optimised.

### Economic functionality

Weak link mitigation could affect the space available for fishing grounds, shipping, tourism and other economic activities. For this reason, an integrated analysis of the societal costs and benefits should be carried out for each function. The continuity of the economic activities should be safeguarded as much as possible. Compensatory measures must be prepared for situations where this proves impossible.

### Living and working environment

Proposed measures should increase the accessibility of the coastal area for both residents and holidaymakers as much as possible and enhance the functionality of the living and working environment. The area's history should remain visible alongside the technological innovations applied.

### Perception value

The choice of location and layout measures should combine environmental, recreational, landscape, cultural and historic functionality as much as possible. The space available for a combined use of the coastal area depends on the functions allocated to it and whether it is possible to create zones in accordance with the activities along the coast.

# Quality of coastal towns

**Clear preconditions to ensure safety and minimise the risks must be developed for coastal towns, subject to which these locations will be given a quality boost.**

Some of the buildings in Dutch coastal towns are located on or in front of flood defence structures, an area to which no legal safety standards apply. Although building in this area takes place at one's own risk, it remains popular due to the attractive aspects of the coast. Rising sea levels are causing the erosion line – the line indicating how far erosion will reach inland during extreme storms – to shift landward. If nothing is done, more buildings will be located in the erosion zone. This also applies to buildings that are currently behind the erosion line and as safe as the areas behind the sea defences. Risk can

increase even if the erosion line does not shift. After all, investments result in the continued growth of the economic value of the area facing risk.

In terms of safety and limiting damage, clear preconditions must be placed on the spatial development of coastal towns. This is all the more important because the current interim policy – a building stop in all areas outside the dikes until building contours around coastal towns have been delineated – offers little clarity to entrepreneurs and project developers regarding the implementation of desired or required investments. This interim policy will end as soon as the red contours round coastal towns have been laid down (c.f. box on page 31). For safety's sake, restrictions are being placed on buildings and hard infrastructure (c.f. Chapter 5). This chapter outlines the preconditions that the national government wants to place on buildings in coastal towns to manage risks and outlines how the national government wants to enable coastal towns to achieve the desired quality improvements.

## Risk management

Figure 2.2 shows which coastal towns include buildings that are located outside the dikes. In most cases, this involves a small zone – a few dozen square metres – reducing the chance that erosion will shift landward. Most permanent buildings, including promenades, are on the inland side of the 1:500 erosion line. These will face risk during a 500-year storm. Permanently occupied buildings are generally built on higher ground and more inland than the promenade – in an area with a lower chance of erosion.

Is this risk acceptable? Perception and acceptance of risk are difficult to quantify. Coastal residents are aware of the dangers that come with life near the sea, but this awareness does not slow building on and in front of the dunes. Apparently, the advantages outweigh the risks and people deem the risks acceptable.

Figure 4.1



### Shifting erosion lines in a fictitious seaside resort

- the current 1:500 line
- - - the 1:500 line in 200 years
- the current 1:10,000 line
- - - the 1:10,000 line in 200 years

*If no measures are taken, rising sea levels and more powerful storms will cause the erosion lines to shift landward*

## Acceptance of risks

What are the economic values and risks associated with the coastal zone? Risk assessment in the coastal zone seems comparable to that of the river area, which also includes built-up space outside the dikes. In fact, however, the coastal zone and the river area cannot be easily compared. Buildings in the river area can be flooded, which would cause damage. In the coastal zone, however, buildings in the dune area could disappear into the sea.

Nonetheless, there are a number of valid comparisons. The economic value per hectare is relatively high in the erosion zone. However, the total economic value is less since the coastal area is smaller than the river area. In that sense, the risks are substantially lower in the coastal zone than in the river area outside the dikes.

There are a number of factors that determine the acceptability of these risks. They should be compared to other sorts of risks. Another important consideration is the amount of investments necessary to reduce the risk. If small investments are sufficient, the risk is probably less acceptable. Finally, the perception value, which is more difficult to quantify, is another important factor.

## Location of the erosion line

Since 1990, the basic coastline has been maintained using sand replenishments, preventing the **structural** erosion of the dunes. However, this form of maintaining the basic coastline cannot prevent **incidental** erosion, which occurs during extreme storms. Sand replenishments are also not entirely successful in slowing the landward movement of erosion as a result of rising sea levels. The number of buildings in the erosion zone is increasing and buildings already located in this zone face an even greater chance of erosion. For this reason, supplementary measures are required.

As with the basic coastline, there are three options for addressing the situation: keeping pace with sea level changes, moving landward and moving seaward. In 1990, the decision was taken to keep pace with sea level changes by defining a basic coastline that has been maintained ever since.

## Keeping pace with sea level changes

entails maintaining the current location of the erosion lines. This option matches the *consolidation* scenario presented in the *Strategic Vision for the Coast of the Provinces of Noord-Holland and Zuid-Holland 2050*. The necessary measures are implemented on the side facing the sea,

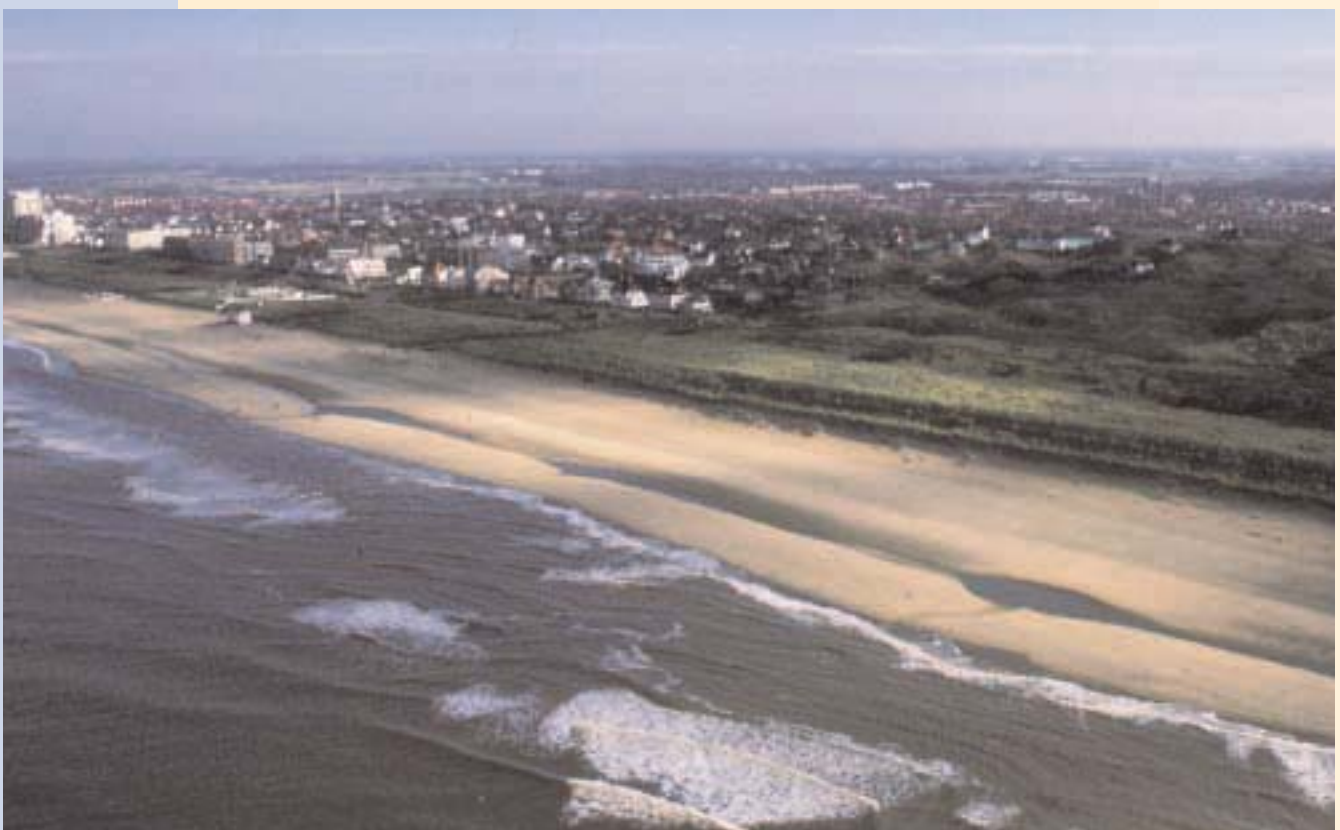
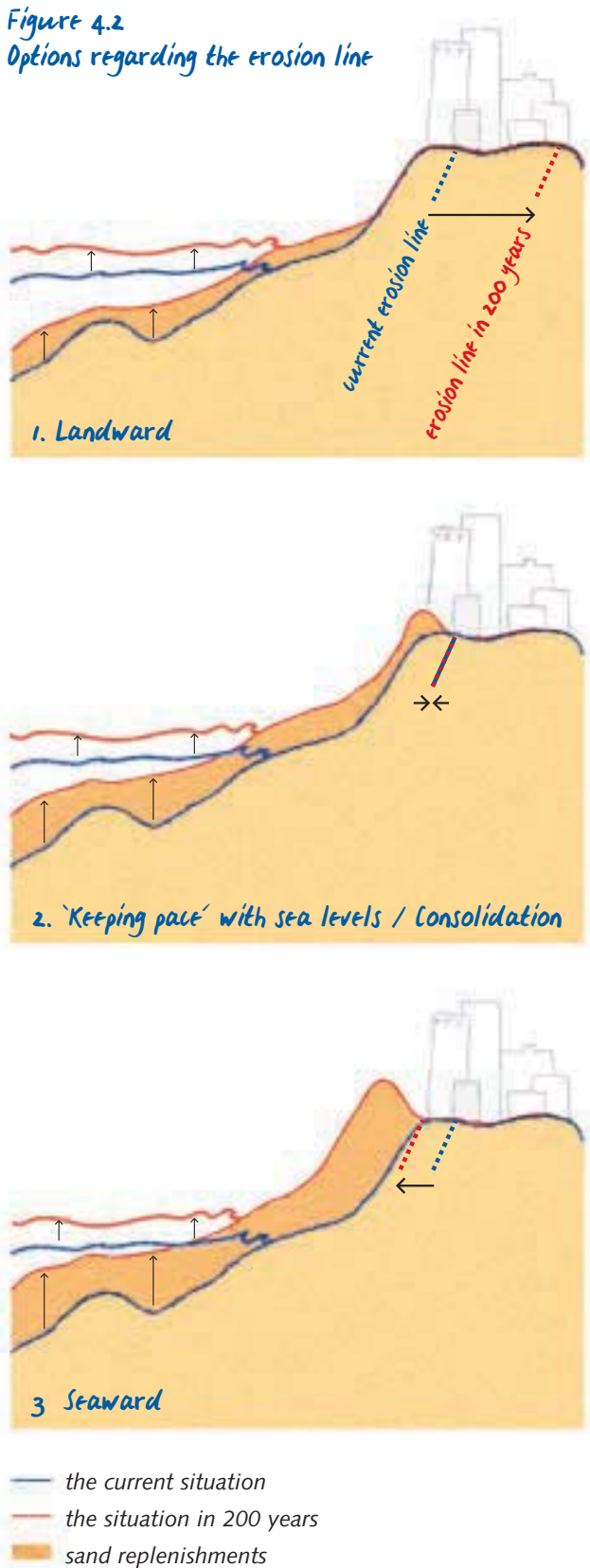


Figure 4.2  
Options regarding the erosion line



The basic coastline is currently maintained using sand replenishments. However, the erosion line is shifting landward due to rising sea levels (1). This is undesirable in built-up areas. By applying more sand replenishments, the seabed and dunes will keep pace with rising sea levels and the erosion line will not shift (2). If still more sand replenishments are applied, the erosion line will move seaward (3).

wherever possible involving large sand replenishments. The entire coastal profile (including the dunes) 'grows' along with rising sea levels. The sides of the dunes facing the sea are reinforced and, if low-lying, raised. To maintain the width of the beach, the basic coastline will also move seaward to a limited extent.

The **landward** scenario allows for the landward shift of the erosion lines. This generally does not create problems for wide dunes. With this option, narrow dunes are widened by creating sand buffers. The basic coastline is maintained at its current location.

The **seaward** solution focuses on reducing the level of erosion during storms by moving the erosion lines seaward. This is possible with offshore measures, including the creation of large-scale sand buffers. In many cases, building an artificial construction is required to keep the sand where it was applied. With this option, the basic coastline moves seaward.

The option of **keeping pace with sea level changes** is preferred for **coastal towns**. This means selectively maintaining erosion lines (only near coastal towns) at their current locations. The advantage of this option is that it can most likely be done using sand-based measures, making it a flexible solution. Sand goes with the flow and, in time, establishes a new coastal balance that requires less maintenance compared to artificial bulwarks. Further investigation is required into the feasibility and the consequences of this option and the possibility of maintaining the 1:500 erosion line as a standard for the promenade. The national government is currently implementing a pilot project to study the possibility of large-scale sand replenishments ('sand depositing').

#### Limiting damage through restrictions

In addition, measures must be taken to limit damage resulting from erosion as much as possible. If the risk of damage increases dramatically, the call to move the erosion lines seaward will become even greater. Chapter 5 elaborates the restrictions that, for safety considerations, apply to buildings outside the dikes but within

the red contours. This chapter focuses on the restrictions implemented to limit damage.

For buildings in the erosion zone, there are two ways to limit damage as a result of erosion:

- Effective building methods, so that buildings remain intact and incur little damage as a result of erosion. Technical measures are also used to prevent damage from wave overtopping.
- Inexpensive building materials, for instance, involving wood constructions with a low economic value.

The *Strategic Vision for the Coast of the Provinces of Noord-Holland and Zuid-Holland 2050* identifies three options to manage risks in coastal towns:

- Consolidate erosion lines using limited offshore solutions.
- Move the erosion lines seaward for parts of certain coastal towns.
- Have the owners of capital-intensive investments help pay for additional flood defence safety measures.

The national government prefers the first option. In many cases, moving erosion lines seaward is not possible without using artificial constructions, which do not fit in with the goal to implement natural, sand-based measures as much as possible. Artificial constructions promote 'bulwark formation', necessitating more intense sand replenishment efforts. The maintenance of coastal towns already requires greater amounts of sand than elsewhere along the coast.

As the area outside the dikes is much smaller than the hinterland, possible damage in terms of victims and investments, too, is much smaller. As a result, there is no social reason to offer the same legally stipulated level of protection against erosion by moving the erosion lines seaward. The fact that varying standards apply to the hinterland also plays a role. Moreover, a storm can be predicted a day or two in advance, giving residents an opportunity to evacuate. Furthermore, the national government believes that the intended spatial quality of coastal towns can also be achieved by transforming the centres of the towns.

Having owners pay for additional safety measures for flood defence structures may seem a logical and equitable solution. But it is difficult to implement. The elaboration of such a scheme opens up complex questions: Who determines the level of contribution? What is it based on? Does a contribution give someone the right to take part in consultations regarding the building and management of flood defence structures? What role do the effects of adjacent coastal sections play? Who bears responsibility for damage resulting from a storm? According to the national government, this is currently not a realistic option.

### **Quality boost for coastal towns**

The development opportunities of coastal towns are limited as they cannot expand in the direction of the sea and restrictions are placed on buildings located on primary flood defence structures. Despite this, it is possible to give coastal towns a quality boost, through which they remain attractive tourist destinations and can compete at international level.

A quality boost can be achieved through a wide range of measures. One example is the creation of additional space. However, the problem here is that the coastal surface is finite. A number of sectors claim large sections of this area, in particular for safety, nature and extensive recreation. The national government's contribution to achieving a quality boost involves stimulating regional planning for tourism and recreational developments and developing clear plan-based conditions for creating the necessary space.

### **Regional planning**

The national government is developing a framework for integrated coastal management (c.f. Chapter 8), laying down regional planning conditions that facilitate tourism and recreational development of the coast and promote co-operation between public and private parties. These conditions primarily focus on promoting risk management and the long-term reinforcement of spatial quality. However, the conditions also serve a short-term purpose. Several key conditions include:

- Maintaining the criteria for spatial quality as presented in the Fifth

National Policy Document on Spatial Planning.

- Promoting spatial zoning of the coast and the associated identity of the coastal town.
- Optimising opportunities for bodies involved in tourism and nature, safety and culture to co-operate.
- Improving the accessibility of coastal towns.

#### Spatial demand

In regional and local planning, the space needed for quality improvements must initially be sought within the core of the existing built-up area. This can take the form of 'infill development', restructuring or re-zoning an area. If additional space is required, this must be linked to the built-up environment, located behind the prima-

ry flood defence structure, and used in accordance with the guidelines presented in the Fifth National Policy Document on Spatial Planning.

Integrated coastal zone policy entails that municipal authorities, provincial authorities, national government and water boards work together to maintain and improve spatial quality. The national government investigates measures that can promote the qualitative development of coastal towns in the short term, while hindering undesirable, irreversible development. By mapping out the consequences of maintaining the erosion lines, it is possible to examine how to shape a quality boost for coastal towns.

### Coastal zoning

The dynamics and economic potential of the coast could be optimally used if the area were divided into zones. The Noord-Holland Directorate for Public Works and Water Management conceptualised four types of coast:

#### The exciting coast

Coastal management reflects an emphasis on intensive recreation and tourism. In principle, beach pavilions could be open all year round.

#### The relaxing coast

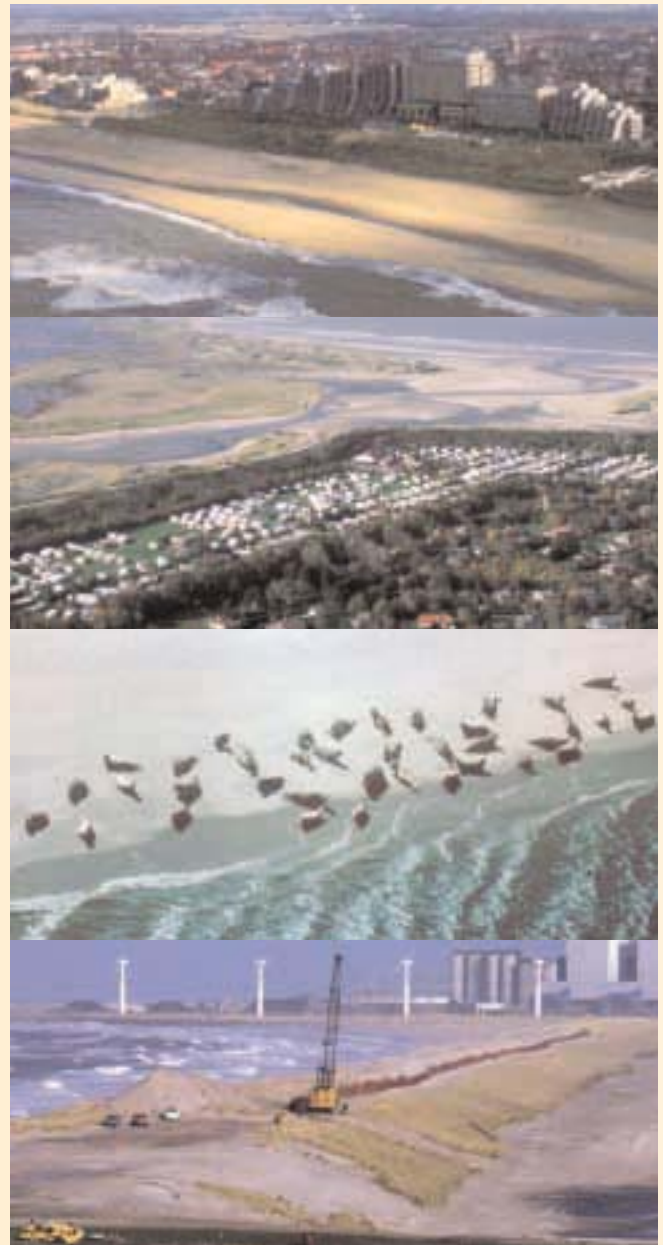
Nature goes hand in hand with, mostly, recreational facilities with accommodation and, during the summertime, provisions for day trips. Beach pavilions at the dune crossings will only be open in summer.

#### Natural coast

Most human activities are to be avoided. Limited space is available for extensive recreation and functions that do not conflict with nature. Maximum space is allocated for the purpose of dynamic coastal management.

#### Industrial coast

This type of coast is characterised by the presence of offshore industry. Large objects such as wind turbines are erected in such areas.



# A sustainable coastal foundation zone

**The coastal foundation zone must be defined and legally embedded. In time, the sand balance in this zone must be maintained and, where necessary, restored.**

The Dutch coast consists mostly of sand, which serves as the foundation of the coast. The coastal foundation zone is dynamic and constantly changing in terms of location and shape. On the whole, it can be compared to a slowly flowing 'river of sand', the 'banks' of which consist of the inner dune edge and the offshore contour of the points lying at 20 metres below Amsterdam Ordnance Datum. All functions benefit from maintaining the sustainability of this sand-based foundation. A deteriorating coastal foundation zone threatens nature, safety and the socio-economic functions of the coast. A *Coastal Zone Perspective* recognises the importance of a sufficient and dynamic supply of sand for the basic qualities of resilience and cohesion. The Fifth National Policy Document on Spatial Planning introduced the 'coastal foundation zone' concept.

Opting for a sustainable coastal foundation zone necessitates anticipating future developments and taking the long-term benefits into consideration. Increasing (offshore and inland) pressure on the space in the coastal zone results in a decreasing amount of space for sand. Given the fundamental importance of sand for the sustainable use of the coast, **sand must serve as a starting point** of coastal policy. This means that the properties of the 'river of sand' (sand flow) must be at the basis of management of the sand-based coastal foundation zone. To do justice to the active nature of sand flow, it must be left unencumbered as much as possible. The sand must be allowed to move freely, which includes erosion, sedimentation and drifting dunes – sand moves from one place to another. Dynamic sand flow maintains the sustainability of the coastal foundation zone along its entire length. In some places, however, erosion threatens the safety of other functions, necessitating sand replenishments. This applies particularly to narrow dune areas

(i.e. the weak links) and coastal towns. Replenishments supplement sand shortages and buffers are created to prevent damage.

If sand replenishments and buffers prove inadequate, the last resort solution can be used, viz. retaining sand using artificial constructions. However, this must be avoided as much as possible since it has far-reaching, long-lasting and uncertain

## Replenishing sand shortages

In the coastal foundation zone, approximately 12 million m<sup>3</sup> of sand is transferred annually from the North Sea to the Wadden Sea as a result of rising sea levels and coastal erosion. An important cause is the Wadden Sea's 'hunger for sand', which is satisfied by sand erosion at the northern end of the province of Noord-Holland and the Wadden Sea islands. In addition to sand, erosion involves silt and other sediments, which is of crucial importance to the ecological function of the Wadden Sea. In addition to this large-scale transfer of sand, sand flow is responsible for local gains or losses of sand. Erosion can pose a threat to some areas, including those with narrow stretches of dune or narrow beaches. Sand replenishments are carried out to compensate for such losses. In the future, additional amounts of sand will be required, particularly in the vicinity of coastal towns and weak links.



## The effects of artificial constructions

The effects of using artificial constructions to retain sand are unpredictable and will be felt for years. The breakwaters constructed at IJmuiden – extended at the end of the 1960s – are blocking sand flow, as a result of which sand is able to accumulate on both sides. This enabled the development of the Kennemerstrand beach on the southern side. Further to the north and to the south, the effects of the breakwaters are still visible in increased coastal erosion, thirty years after their construction. The construction of breakwaters at Hook of Holland has had a similar result.

consequences. Natural sand flow changes as a result, affecting the distribution of sand in adjacent coastal sections.

The coastal foundation zone must be managed using a three-pronged strategy: allowing sand to move freely, creating sand buffers and retaining sand. How this strategy is applied to a certain area depends on the shape and location of the coast. This strategy promotes cohesion between functions and developments in the coastal zone since a sustainable sand foundation is important to all.

### Boundaries

The coastal foundation zone must be delimited to guarantee that sufficient space remains for efforts to reinforce sea defences. The offshore boundary has been laid down, viz. the area starting along the contour of the points lying at 20 metres below Amsterdam Ordnance Datum that makes a direct contribution to the volume of sand of the coastal foundation zone. The definitive inland boundary has not yet been laid down. There are several possibilities.

### Narrow dunes and dikes

At these locations, the coastal foundation zone borders along the inland boundary of the flood defence structures, taking rising sea levels over the coming 200 years into consideration. This does not easily allow space for a broader definition. The flood defence manager lays down the boundary in the precept document, following consultations with the provincial authority,

municipal authorities and other interested parties. Once laid down, the boundary is not open for discussion. Developments that enhance the natural dynamic of the coastal foundation zone are supported.

### Wide dunes

In terms of safety alone, it is sufficient in wide dunes to locate the boundary of the coastal foundation zone at the inland boundary of the sea defences. In this coastal foundation zone, safety measures can be combined with measures (motivated by other considerations) to improve spatial quality. However, space is available on these locations for a broader definition, in which the coastal foundation zone extends to the inner dune edge. There are two subzones within the coastal foundation zone, viz. the primary flood defence zone and the zone between the flood defence structure and the inner dune edge.

With a wide definition, measures in the coastal foundation zone that serve a social objective can be co-ordinated. This is key to management bodies. The water boards and the national government manage the flood defence structures and the offshore part of the coastal foundation zone. Land management organisations, water abstraction companies or provincial/municipal authorities manage the inland part of the coastal foundation zone.

### Wadden Sea and Wadden Sea islands

The Wadden Sea and Wadden Sea islands assume a special place in the coastal foundation zone. Two definitions also apply to these, both of which consider the entire Wadden Sea as a part of the coastal foundation zone. After all, the total volume of sand in the Wadden Sea must be maintained and supplemented (in response to rising sea levels).

A wide coastal foundation zone in the Wadden Sea extends from the line formed by the points lying at 20 metres below Amsterdam Ordnance Datum to the north of the Wadden Sea islands to the flood defence structures in the provinces of Friesland and Groningen. In this definition, the Wadden Sea islands in their entirety are considered a component of the coastal foundation zone. Buildings on the islands

*DISCUSSION POINT:  
With regard to wide dunes, will the definition of coastal foundation zone be defined as 'narrow' or 'wide'?*

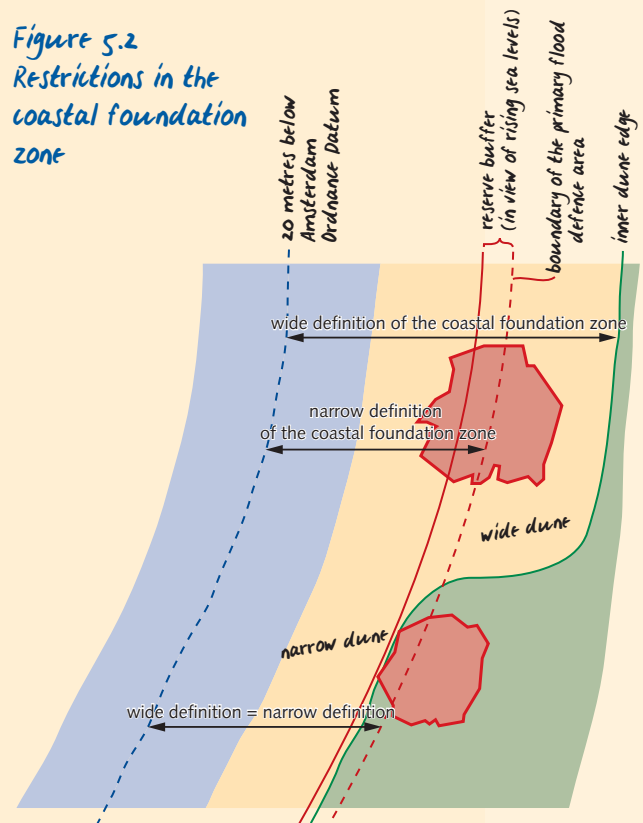


are comparable to buildings in coastal towns. A narrow definition maintains the same boundaries as the wide definition, but does not include the areas inside of the dikes on the islands as part of the coastal foundation zone.

### Restrictions

Restrictions are placed on buildings and hard infrastructure for the entire coastal foundation zone, whether given the wide or narrow definition. For safety considerations, the restrictions only apply to the area between the contour of the points lying at 20 metres below Amsterdam Ordnance

Figure 5.2  
Restrictions in the coastal foundation zone



In wide dune areas, the coastal foundation zone can be defined as 'wide' or 'narrow'.

### Determining the red contours

Red contours are the boundaries of the area in which urbanisation may occur in the coming decade. The municipal authorities propose the exact outline of these contours on the basis of provincial or regional (strategic) policy documents.

Below are a number of criteria that must be met when determining the red contours:

- In areas needed in the future to maintain the safety of sea defences, the red contours coincide with the boundaries of built-up areas. Expansions must never adversely affect the water system (causing an increased risk of coastal erosion, reduced safety, waterlogging, soil subsidence, water quality deterioration, problems with the drinking water supply or water depletion in nature areas, for example).
- The use of existing built-up areas takes precedence over expansions. Adverse effects on special elements of urban architecture, cultural and historic qualities or green space must be avoided. By the year 2015, at least 50% of urban functions should be brought within the 1996 boundaries of built-up areas.

Using the regional plan procedure and (strategic) policy documents, the national government is able to ascertain whether the provincial authorities and co-operating municipal authorities have met these criteria and whether the proposed red contours are sufficiently in line with the national policy laid down in key planning decisions.

Source: Fifth National Policy Document on Spatial Planning.



Building restrictions apply in the coastal foundation zone, regardless of whether it is defined as 'wide' or 'narrow'.

Datum and the inland boundary of the primary flood defence structures. Until the red contours round coastal towns have been laid down, the interim policy remains in effect.

The area between the inland boundary of the flood defence structures and the offshore boundary of the coastal foundation zone, in so far as this area lies **outside of**

**the red contour: Not unless.** Building and surface mineral extraction are not permitted in this area (except in such areas as channels). 'Unless' entails substantial societal considerations or situations in which the proposed activity cannot reasonably take place elsewhere. The Fifth National Policy Document on Spatial Planning outlines a step-by-step plan for the offshore area.

The area between the inland boundary of the flood defence structure and the offshore boundary of the coastal foundation zone, in so far as this area lies **inside of the red contour** or entails a recreational area with accommodations: **Only if.** Renovation and new construction is permitted only if it does not impact the safety of the hinterland. This means that no sand is extracted from the flood defence structure and that no artificial constructions are built that fix dunes or dikes in place or hinder the process of erosion.

A unique situation involves places within the red contours that are located **immediately inland of a weak link.** With a view to

the necessary spatial reservation for future reinforcement of the sea defence structures, **not unless** applies to buildings in the protection zone of the flood defence structure.

A one-time possibility to expand (by 10%) applies to all existing buildings in 'not unless' areas.

No restrictions are placed on areas located **inland of primary flood defence structures** for reasons of safety. Despite this, an unconditional '**yes**' does not always apply to these areas, as restrictions from another policy may also apply. Consequently, the requirements for red contours from the Fifth National Policy Document on Spatial Planning must be met and **restrictions that apply to nature management policy** (including national ecological network, Nature Conservation Act, Bird and Habitat Directive and related policy) and **water abstraction.** In the Wadden Sea, the restrictions from the Third National Policy Document on the Wadden Sea apply.

### Implementation

The boundaries of the primary flood defence structures and the associated restrictions from a safety perspective are laid down in the water authority bye-law and precept documents from the flood defence managers. For this reason, the boundaries are legally binding and the management bodies are entitled to enforce the restrictions, involving water boards through the Waterschapswet (Water Boards Act) and the national government through the Wet beheer rijkswaterstaatswerken (Public Works (Management of Engineering Structures) Act). Regional and zoning plans must be incorporated into spatial planning to ensure that the boundaries and restrictions are integrated.

The coastal foundation zone, too, must become legally binding and subsequently integrated into spatial planning. As soon as the boundaries of the coastal foundation zone have been determined, these and the associated restrictions will be laid down in regional and zoning plans.

*DISCUSSION POINT:  
Must the national government or another tier of government tighten the general restrictions from the Third Coastal Policy Document and the Fifth National Policy Document on Spatial Planning?*

### Buildings on the beach

Beaches do not fall within the red contours, which means that permanent buildings are not allowed. For safety reasons, only temporary buildings such as beach pavilions are permitted, and only from 1 March to 1 October. All beach pavilions must meet the conditions stipulated by the management body responsible for the beach and the flood defence structure. Additional conditions or limitations may be imposed for reasons associated with spatial planning, nature and landscape. Permanent beach pavilions should be avoided in wide dune areas without buildings.

With regard to safety, beach pavilions in coastal towns or recreational centres that are (partially) situated in or directly behind the flood defence structure may be operated throughout the year, on the condition that the red contours and the boundaries of the recreational centres have been determined by law. Permits for the year-round operation of permanent beach pavilions are only granted for a limited period. Extensions depend on the current situation.

# Effective coastal policy and administration

**National and provincial policy demands should be co-ordinated as much as possible. They should also be integrated into the policy and administration of the administrative bodies involved. This requires clarity regarding responsibilities and liability.**

The current sector-based division of tasks in the coastal zone causes problems associated with the integration, implementation and maintenance of policy. This chapter suggests a number of proposals for improvement, focusing first on integrating national policy into regional and local policy and the co-ordination of functions. In future, the integration of European (spatial) policy will also be important. In addition, tools are provided to create more clarity about the responsibilities, powers and liability in matters concerning the coastal zone.

According to the Third Coastal Policy Document, the adaptation of the policy tools is too slow to prevent undesirable developments in the coastal zone. The authors expected better results from administrative agreements, covenants and implementation of the new policy formulated in the Fifth National Policy Document on Spatial Planning.

This chapter focuses on improving the existing consultation structures and instruments. Future developments in integrated coastal zone policy will be discussed in Chapter 8. It should be noted that all proposals are based on a national framework for coastal zone policy.

National coastal policy will be laid down in a policy line, which will include the coast-related aspects of the Fifth National Policy Document on Spatial Planning and this policy agenda. In accordance with *Ruimte voor de Rivier (Space for the River)*, the policy line will outline coastal policy and be integrated into the spatial and water management plans drafted by the provincial authorities, water boards and municipal authorities. Once they have adopted it, the ministries must adhere to the policy line.

Administrative agreements provide for implementation of policy by the lower tiers of government.

## Responsibilities

One task that is shared by all administrative levels in spatial planning (viz. the Ministry of Housing, Spatial Planning and the Environment, provincial authorities, municipal authorities) is the attempt to establish a balance between the various interests in the coastal zone. National spatial policy, including spatial policy for the coast, is laid down in a national policy document, which is subsequently integrated into provincial regional plans. However, policy is not legally binding until it has been laid down in municipal zoning plans. The provincial authorities then assess these zoning plans for compliance with national and regional policy. Finally, the municipal authorities are responsible for implementation and enforcement.

In general, flood defence management, which, according to the Flood Defence Act, includes protection of the hinterland, is a responsibility of the water boards. In some cases, the national government bears this responsibility. In accordance with the Flood Defence Act, a precept document is adopted, which imposes restrictions on activities in the flood defence zone. Pursuant to water authority bye-laws, water boards may issue permits to allow activities in the zone. The national government derives these powers from the Public Works (Management of Engineering Structures) Act.

The provincial authorities supervise the flood defence management activities of the water boards. The national government bears final responsibility for sea defence management. Pursuant to the Flood Defence Act, it is also responsible for preventing structural coastal erosion. The Provincial Coast Consultation Bodies advise the Minister and the provincial executive involved on the nature and scope of the sand replenishment programme.

## Government powers

The various tiers of government have been granted the following powers for policy implementation and enforcement.

### Flood defence

#### National government

- Drafts the precept document, on the basis of which permits are granted for activities in flood defence zones that are managed by the national government.
- Enforces compliance with the preconditions in flood defence zones that are managed by the national government. If necessary, recourse is taken to administrative enforcement.
- Supervises flood defence management. Has the authority to issue designation orders.

#### Provincial authorities

- Supervise flood defence management.
- Discontinue work that conflicts with the public or provincial interest (with the exception of work commissioned by the national government).
- Commission work that is necessary for flood defence.

#### Water board

- Drafts the water authority bye-law and corresponding restrictions.
- Grants permits for activities in the flood defence zone.
- Enforces compliance with the water authority bye-law.

### Spatial planning

#### National government

- Prepares the key planning decision.
- Has the authority to issue designation orders relating to the adoption and contents of regional plans and zoning plans.
- Has the authority to amend the official approval decision of zoning plans.
- Has the authority to render inoperative concrete policy decisions that have been laid down in the regional plan.

#### Provincial authorities

- Adopt regional plans.
- Elaborate and implement regional plans.
- Have the authority to issue designation orders relating to the contents of regional plans and zoning plans.
- Approve zoning plans.

#### Water board

- Adopt zoning plans and, if any, structure plans.
- Elaborate, implement and amend zoning plans.
- Grant permits and exemptions relating to zoning plans.
- Enforce zoning plans and impose penalties.

The authority to issue designation orders and amend decisions is rarely used, as it would have far-reaching consequences for the administrative interrelationships.

### Liability

The question of who is liable for damage caused by storm erosion is relevant in the areas outside the dikes. In principle, the owner of the property or infrastructure in question is liable. Anyone who wants to build in areas outside the dikes, where no legal safety requirements apply, requires a permit issued by the municipal authorities and the water board. The municipal authorities assess building permit applications using a limited general assessment framework, which does not take into account possible damage to the buildings. The water board's decision depends on whether the flood defence structure is likely to sustain damage.

The government is liable for damage caused by coast erosion in the following cases:

The government has acted unlawfully. If the government has been negligent in the performance of tasks which could have prevented the damage or if it has failed to provide sufficient information, the Netherlands Civil Code stipulates that it has acted unlawfully and must fully compensate the damage.

Compensation pursuant to the law (loss resulting from government actions) or regulations (compensation schemes for loss resulting from government actions). The government has performed its tasks prop-

erly, but the measures have resulted in damage. Buildings have been demolished to enable reinforcement of the sea defence structure, for example. The tier of government involved must compensate the damage equitably.

Although property owners in the erosion zone bear primary responsibility and liability, the government may decide to provide partial compensation in the event of rare calamities. Depending on the situation at hand, a decision is taken with a view to the general interests and welfare of the public.

### Implementation

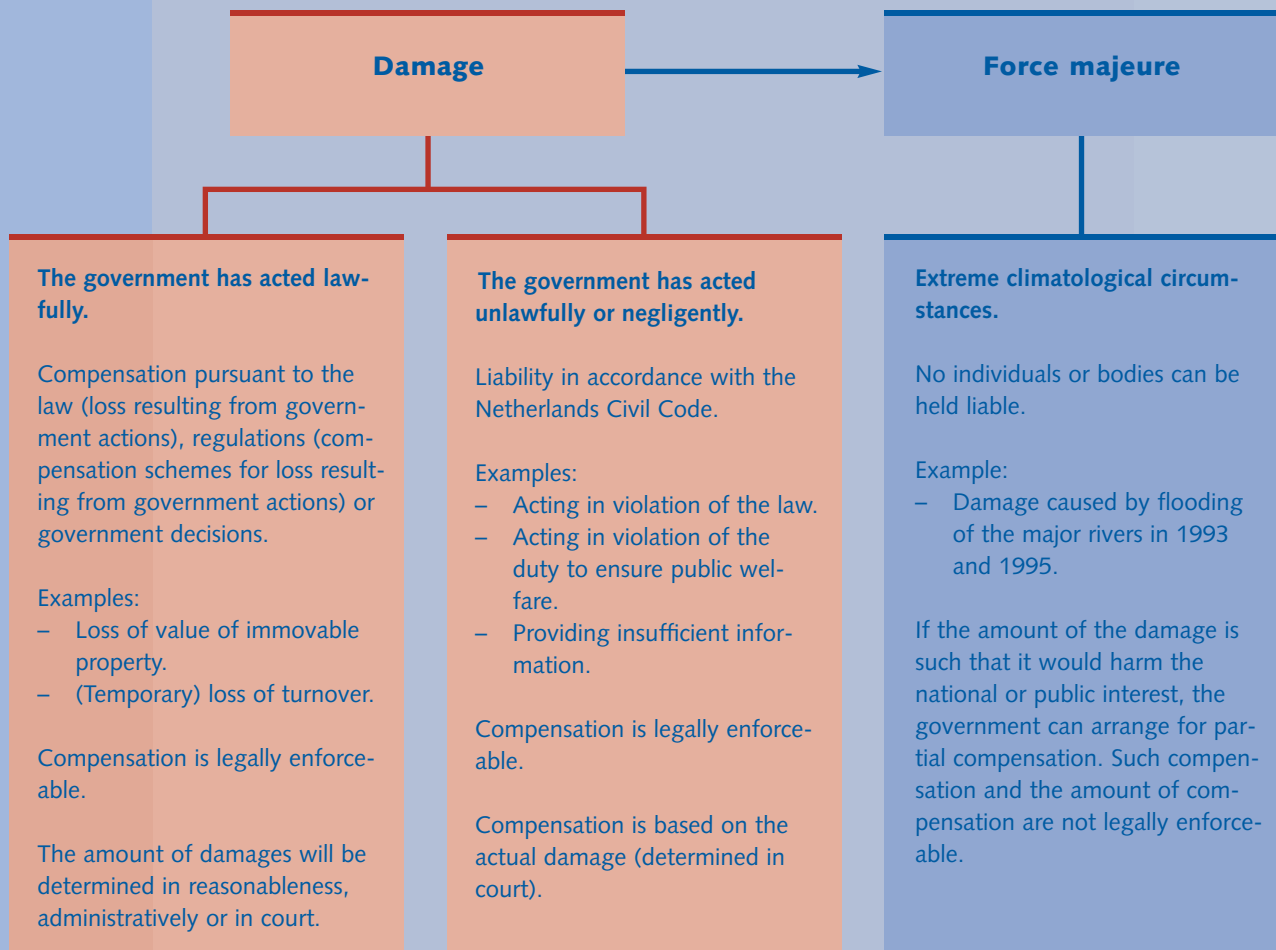
Within the current administrative structure, the responsibilities and powers described above are capable of improvement in terms of policy co-ordination and implementation. Conflicts could be minimised through better co-ordination, eliminating the need to take recourse to unpopular enforcement provisions.

### 1. Streamlining consultation structures

The Third Coastal Policy Document highlighted the pivotal role played by the Provincial Coast Consultation Bodies in policy co-ordination and implementation as well as their advisory role to the Minister of Transport, Public Works and Water Management. The composition of these consultation bodies varies per province, but always includes representatives of the provincial authorities, municipal authorities, water management bodies and national government. Some Provincial Coast Consultation Bodies also include representatives of interest groups, which ensures better co-ordination of sector-based interests.

Integrated decision-making processes require harmonisation of coastal policy and spatial planning policy. The Third Coastal Policy Document recommended active co-operation between the (extended) Provincial Coast Consultation Bodies and

## Liability in the event of damage



Provincial Planning Committees, the latter being spatial planning advisory bodies to the provincial authorities and comprising representatives of the Ministry of Agriculture, Nature Management and Fisheries, the Ministry of Housing, Spatial Planning and the Environment and the Ministry of Transport, Public Works and Water Management and various land management bodies. The progress made will be evaluated annually during meetings between the chairpersons of the Provincial Coast Consultation Bodies and the Minister.

Lack of clarity regarding powers can be prevented by laying down the arrangements in agreements under public law, such as administrative agreements and covenants. They usually contain general policy intentions without clearly defined obligations. Arrangements made on the basis of the coastal policy line may be laid down in administrative agreements. These agreements are purely voluntary and only apply to the parties involved.

## **2. Alignment with legislative amendments**

Legislation is currently being amended, which could improve policy co-ordination.

### *Algemene wet bestuursrecht (General Administrative Law Act)*

The amendment, which introduces regulations for information provision and co-ordi-

nation, should achieve improved harmonisation of the permit procedure. The former regulations prescribe the government's duty to inform the permit applicants about other applications they must submit. The co-ordination aspect applies to complicated decision-making situations. These regulations provide for the co-ordination of the decision-making process by one administrative body, while decisions will still be considered by the separate tiers of government. This body will ensure consistency and facilitate information exchange. The regulations will probably not become effective until 2004.

### *Wet ruimtelijke ordening (Spatial Planning Act)*

In 2001, the Dutch government agreed to the publication of a preliminary draft of a fundamental review of the Spatial Planning Act. The amendment aims to achieve the same improvements as the new coastal policy, viz. more clearly defined responsibilities, improved policy implementation and more and adequate (enforcement) powers. The amendment will only become effective in 2004, until which time coastal policy will have to make do with the instruments described in this section. Nevertheless, it is important to start preparing for these changes.

The amendment provides for a number of new instruments, while abolishing some of



the existing ones. The national government's and provincial authorities' current planning structure, consisting of a key planning decision, regional plans and zoning plans, will be replaced by the (strategic) policy document, in which the various tiers of government will present the outlines of intended spatial developments. Such a (strategic) policy document may also prove valuable for the coastal zone.

As soon as the amended Act becomes effective, zoning plans no longer require the approval of the provincial authorities. This could impact the role of the Provincial Planning Committees, which now primarily consists of giving advice with regard to zoning plan approval.

#### *Flood Defence Act*

Ensuing from the Fifth National Policy Document on Spatial Planning, the expected amendment to the Flood Defence Act prescribes consultations between the flood defence manager, provincial authorities, municipal authorities and other interested parties once the precept document is adopted. These consultations are not limited to participation, but include additional consultations initiated by the flood defence manager. As such, these changes are comparable to the consultations between the municipal authorities and water management bodies as referred to in the Spatial Planning Decree. In accordance with the Fifth National Policy Document on Spatial Planning, the location of the flood defence structures must be integrated into zoning plans, taking into account the 'high' scenario of 200 years of rising sea levels. This may be included in the amendment to the Flood Defence Act.

### **3. The water test**

The water test is an integrated test to assess whether spatial plans have taken into account aspects of water management, such as flood defence. Since the beginning of 2001, the test has been used to assess all spatial plans that have not yet entered the participation procedure and that have not yet been submitted to the other tiers of government. They include amendments to regional plans and zoning plans, new plans for the construction of infrastructure, dwellings or industrial

estates, and urban and rural restructuring plans.

The water test has been approved and a *Guideline* for its use has been published. The test will be an additional guarantee that existing legal provisions are used. The Spatial Planning Decree requires that the provincial and municipal authorities consult with the water management bodies regarding the adoption of regional plans and zoning plans. The water test is the proper instrument to effect the inclusion of a flood defence section in all spatial plans, as was recommended in the Third Coastal Policy Document. The flood defence section should describe the restrictions associated with the location of the primary flood defence structure and/or the coastal foundation zone. The location of the primary flood defence structure should also be indicated on the maps included in regional plans and zoning plans.

### **4. Permits for a limited period of time**

Spatial reservations are made in the coastal zone to reinforce flood defence structures in view of rising sea levels. Partly for this reason, a building stop has been in effect outside of the built-up areas in the coastal zone since 1997. The extent of sea level rise and the time when the spatial reservations will have to be put to use remain uncertain. The question has been raised whether the building stop should be abolished in places where reinforcements will only be needed a hundred years from now.

Many government authorities are reluctant to abolish the building stop. They expect that it will be very difficult to remove these buildings once it becomes necessary. This is largely a social concern, since the legal reality is that the issuance of permits for a limited period of time seems a very realistic option and a particularly popular option among (tourism-oriented) businesses in the coastal zone. The possibilities for such permits should be examined further.

**DISCUSSION POINT:**  
*Is this option socially and administratively desirable? (If so, where will the line be drawn? Will demountable beach pavilions that last for ten years or hotels that will stand in the area for forty years be allowed?)*

# Raising awareness and communication

More effective and strategic communication is needed to increase storm surge awareness among individuals and government authorities. Such increased awareness would facilitate shaping other policy issues.

Integrated coastal zone policy requires integrated communication about all the aspects that play a key role in the coastal zone. To date, coastal policy primarily involves a sector-based approach. Consequently, communication between the various tiers of government, organisations and individuals involved occurs along policy fields. This lack of cohesion results in the absence of clarity regarding the possibilities and prohibitions in the coastal zone.

The follow-up process towards integrated coastal zone policy requires an integrated message about the coastal zone. A responsible approach towards the coast requires more than just awareness of the risks. Pressure from the sea and land has a considerable impact on nature in the coastal zone as well. It follows that effective communication to raise storm surge awareness entails more than safety alone. To start, we need to refresh our collective memory.

## Risk awareness

For centuries, storm surge awareness was a matter of course for people living along the coast. The sea was a natural force that the Dutch could not contain. Storm surges left scars that remained visible for years. However, in the twentieth century, storm surge awareness among the Dutch has decreased considerably. Several decades of powerful technical measures have instilled an unshakeable faith in coastal defences, which sometimes results in an irresponsible attitude.

Current safety standards can only be maintained if there is sufficient public support for the measures that have to be taken. This support can only be created by increasing storm surge awareness. The question is how this should be done, which

## The message

A storm surge is the result of a concurrence of circumstances, such as the combination of spring tide and a strong northwesterly storm that lasts several days. Water pushes up against the coast and waves may reach the dikes and the dunes. The threat of such a storm has always existed. If residents and other users of the coastal zone were aware of their particular coastal section's history, they would be able to put their faith in artificial flood defence structures into perspective and have more appreciation for measures aimed at supporting the area's natural dynamics.

Dutch dikes and dunes can withstand 4,000-year storms or even 10,000-year storms. This may seem safe. However, such an event could take place at any time, and might even occur again one or two years later. For instance, the extremely high water levels in the river area in 1993 reoccurred in 1995.

Spring tide occurs every four weeks. Powerful storms occur regularly in autumn and winter. The dunes and dikes are strong, but the chances of extreme storm surges are not completely theoretical. In fact, climate changes resulting in rising sea levels and a higher frequency of storms will make them more likely. Consequently, additional space is required to construct broader and higher flood defence structures. People should be made aware of such matters to enable them to make a well-informed contribution when decisions are taken with regard to the layout of the coastal zone.

If individuals and residents are to understand the restrictions and spatial reservations, they should be made aware that the government has undertaken to ensure flood protection in the long term and, in doing so, must take the least favourable scenarios into account. This means that they will have to come to terms with measures that are essential in the long term, such as spatial reservations.

Finally, in generating support for the 'contours' policy regarding coastal zone development, people should realise that economic expansion leads to higher risks. The more investments are made in risk areas, the more damage may be inflicted.



target groups should be focused on and what the core message should be.

#### **What people should know**

In short, people should know what a storm surge is, how great the risk of a surge occurring is, and which flood defence measures are needed now and in the long term. People should also be informed of the reasons for the spatial reservations and building contours. That safety is a long-term issue must be emphasised and that the possible damage from flooding may be so high as to render investments in risk zones unacceptable. *Space for the River* could be used as a guideline to formulate the core message. In general, there is little difference between the awareness of rivers and water levels to be created among residents of the river area and the awareness of the sea and the coast to be created among residents of the coastal area.

#### **Target groups**

There are three important target groups for coastal awareness, viz. government authorities, organisations involved in coastal matters, such as interest groups and business associations, and residents of the coastal area and the hinterland. These groups can-

not be treated as entirely separate entities. After all, if storm surge awareness among individual residents and users of the coastal zone increases, awareness among organised groups will also grow.

#### **What is already known**

There is insufficient knowledge about current storm surge awareness among these three groups. The majority of Dutch people is aware that, without technical interventions, half of the country would be under water. However, few seem to consider the consequences, which is probably due in part to the current high safety standards and the fact that disasters (almost) never occur. People probably know more than they think, but they seem to close their eyes to dangers they feel are beyond their control. A study should be conducted to map out what the target groups (do not) know and the causes of this lack of knowledge. Ignorance and indifference are two different matters that require two different approaches.

#### **The consequences of insufficient awareness**

Conflicting interests of safety, economy and nature in particular are likely to occur



if consultations between the various tiers of government are inadequate. A lack of storm surge awareness makes it more difficult for administrators to give precedence to long-term safety considerations over current interests. To complicate matters further, different tiers of government often represent different interests. One government authority may have serious objections against a building permit granted by another government authority. Building may even be allowed without a permit. Such lack of clarity and ambiguity is not helpful.

### **What should be done**

First, it should be investigated why people in the coastal zone and the hinterland almost never consider the risks. Is it indifference? A lack of information? Or is the information ignored and do people not want to know? These questions should be answered before any communication or education plans can be drafted.

There are various possibilities to convey a targeted message:

### **Communication**

- Seeking alignment with the *Water Management in the 21st Century* communication programme.
- Providing information about causes and measures in the event of (near) disasters and damage in connection with flood defence structures.
- Sending an area-based safety policy document with the water board charges assessments and decisions with regard to the issuance of permits under the water authority bye-law.
- Involving people in interactive policy formulation.

### **Education**

- Including the subject in physics, biology, geography and history lessons.
- Inviting the media to the annual test of artificial flood defence structures.
- Erecting tourist information signs at primary and secondary flood defence structures.

The outlook of spatial developments in the coastal zone could send the wrong message. Massive flood defence structures cre-

ate the impression that the sea has been permanently contained. A promenade with vulnerable high-rise buildings along the edge of the beach seems to deny the presence of any risk or danger. Wooden beach pavilions and wide stretches of wind-blown dune, on the other hand, evoke an image of dynamics, transience and flexibility. Landscaping should anticipate expected future developments.

The tools for communication and education should present a unified vision of the coast. Is it mainly a sea defence area or an area where there is good money to earn? If the tools to provide information create a uniform image or coastal *appeal*, they will be more effective.

The importance of providing the public with proper information and education should not be underestimated. If voters are aware of the risks associated with storm surges, so will politicians. Political and policy choices will only receive broad support if people understand the underlying reasons.

Finally, the attempt to create storm surge awareness is first and foremost a matter of taking action. The close interrelationship of the various coast-related issues sometimes results in a kind of deadlock, resulting in situations in which one of the problems is not addressed because the others have not been solved first. The only way to break the deadlock of 'everything is interrelated' is to act!

# Integrated coastal zone policy

The national government must outline a follow-up process leading to integrated coastal zone policy and indicate the initial steps to be taken.

The European Commission has recommended that the member states develop a national vision and strategy for integrated coastal zone policy. According to the EU, an integrated approach should focus on sustainable safety, protection of natural ecosystems and socio-economic improvement. As Europe contains various types of coast, the member states are free to determine the main components of their national coastal policy. The Netherlands has opted for a concept that focuses on 'spatial quality and sustainable safety', emphasising ecosystems, safety, environment, economy, liveability, accessibility and awareness.

## Vision

In the preliminary study *A Coastal Zone Perspective*, the four ministries involved

## European recommendations for integrated coastal zone management

In October 2001, the European Environment Council made recommendations for integrated coastal zone management, stressing the strategic importance of coastal areas as residential areas and links in the trade and transport chain. Attention was also drawn to the fact that these areas contain ecologically valuable habitats and are favourite holiday spots. However, a number of serious problems can be identified. Habitats are threatened, the coast is eroding and resources are running out. The environment ministers are in favour of integrated policy, which would involve both national and international frameworks and consistent management at local and regional level. A European vision of the coastal zone is being prepared to support this approach.

distinguish three basic qualities of the Dutch coast: resilience, cohesion and horizon. On the basis of these qualities and the themes addressed in the EU recommendations, the Dutch vision of the coastal zone could include the following:

### Ecosystems

To protect existing ecosystems, there should be sufficient space for natural processes (**resilience**) in the coastal area. Interventions in the ecosystem not only affect the immediate environment, but other parts of the system as well. Barriers between the sea and coast and between the various dune areas should be prevented or removed where possible. The aim in respect of estuaries – the most productive ecosystems – is to restore the natural freshwater/saltwater interfaces (**cohesion**).

Additional activities, such as fishing and water abstraction, should be carried out in a sustainable manner. An integrated approach should be implemented to create a balance between all of the functions and ecological quality. Given the connection between the coast and sea, the (ecological) quality of the shallow sea and the maintenance of the littoral drift must also be ensured. An example is the development of



a marine reserve to compensate for the loss of nature resulting from the development of the second Maasvlakte (artificial port and business area in the North Sea).

### Safety

The problem of rising sea levels requires safe and resilient sea defences. Natural solutions that safeguard the area's dynamics, such as widening the stretch of dunes and turning (sand) dikes into dunes (**resilience**), are preferred flood defence reinforcement measures. Seaward expansion of the coast is another option, provided that the additional space comes in tandem with spatial quality improvements, with an emphasis on nature, landscape and recreation. Safety assurance must not hinder the preservation of the coastal zone's spatial quality or affect the special characteristics of coastal sections.

### Environment

Environmental pollution in the coastal zone should be further reduced. Although the levels of pollutants in the coastal area and coastal waters are gradually decreasing, water depletion, acidification and air pollution continue to take their toll. The levels of acid and nitrogen in dry areas of dune grass and nutrient-poor dune valleys are still too high.

The majority of this pollution comes in the form of air pollution (atmospheric deposition) and can only be properly addressed by a generic international emissions policy. Additional area-based national and regional

measures can be taken to prevent water depletion and pollution. Water depletion and pollution on the inner dune edge can be prevented by bulb growing. The construction of wind parks can contribute to a reduction of CO<sub>2</sub> emissions, provided that they do not 'pollute' the **horizon**.

### Economy

The economic function of the coastal zone – mainly tourism and recreation – should be reinforced in a sustainable manner. The strengths of the Dutch coast – variation, naturalness and cultural and historic value – must be preserved or improved (**cohesion**).

Intensive recreation in coastal towns should be given a quality boost and include state-of-the-art facilities. Coastal towns have to develop more pronounced identities. Outside of these towns, opportunities for extensive and largely nature-oriented recreation are to be found along the entire Dutch coast. More space for nature and recreation could be created at the weak link between Kijkduin and Hook of Holland by widening both sides of the stretches of dune.

The expansion of bulb growing and glasshouse horticulture in the coastal zone could be compensated by better emphasising natural transitions on the inner dune edge. This could be combined with the reorganisation of these sectors and the development of sustainable project locations.



### Liveability

A great deal of attention should be given to the perception values and liveability when taking decisions regarding the coastal zone. This means that unobstructed sea views should be preserved and that undeveloped areas, quiet and darkness (**horizon**) are important. The cultural and historical value is another important aspect of the liveability. Elements of cultural and historical value should be preserved. New ones should be developed, provided that they fit in with the existing elements as much as possible. The EU recommendations for integrated coastal zone policy suggest a 'local cultural and historical system with extended functionality'.

### Accessibility

Sustainable accessibility of the coastal zone should be effected in accordance with the existing zones in the area (**cohesion**), where built-up areas with intensive recreation exist alongside areas where nature and resilience come first. Popular coastal towns would benefit from efficient public transport and access for cars. For less frequented coastal towns, the emphasis is placed on transfer interchanges, public transport, and walking and cycling tracks. The necessary infrastructure should fall in the 'normal' development category and be subject to the same conditions (Third Coastal Policy Document).

### Awareness

Awareness among the public and various organisations involved should be 'updated' with new developments, knowledge and initiatives. Giving shape to integrated coastal zone policy and implementing it is a complicated issue, which requires weighing various crucial interests relating to space, nature, safety assurance and risk management. These matters are important to all residents and users of the coastal zone, and many others in the hinterland, but outsiders may find it hard to understand them. Effective communication is therefore indispensable.

Safety is an essential precondition, which must never be endangered by integrated coastal zone policy. Having said this, however, the six themes addressed in the EU recommendations are all considered equally important.

### Strategy: coastal zone policy co-ordination

How can an integrated vision of the coastal zone be translated into integrated policy?

The EU recommendations also apply here in that they offer a number of basic principles for integrated policy and management:

A suitable national framework to manage and support local and regional measures. Regional customisation, consisting of locally and regionally-aligned strategic and co-ordinated measures (area-based approach). Interactive planning.

In what way do these principles apply to the Dutch situation? In drafting a **suitable national framework**, the extent to which the national government should be involved must be determined. Should it only provide general frameworks or should it act as a 'director' and supervise implementation?

Currently, the effects of national policy are visible in regional plans and zoning plans (spatial planning) and in provincial water management plans, precept documents and water authority bye-laws (water management). By streamlining the sector-based national policies, an attempt could be made to gear current policy implementation to integrated objectives. However, the national government has identified a number of organisational and policy-related problems in current policy implementation that might hinder integrated policy and management (cf. section 2.2).

The national government has opted to integrate the sector-based policies into one consistent policy line for both inland and offshore aspects of the coastal area. This policy line should include a vision that is in line with the various applicable policy documents and European directives, viz. the Fifth National Policy Document on Spatial Planning, Kaderrichtlijn Water (Framework Directive on Water), Water Policy in the 21st Century, nature management policy that is being prepared for the North Sea, Programma Versterking Zoet/Zoutovergangen (Restoration of the Freshwater/Saltwater Interfaces programme) and the announced Beleidsbrief Recreatie

(Recreation Policy Letter). In addition, the policy line must indicate the schedule and approach that will be applied for the purpose of the integrated national strategy, which must be completed by 2004/2005. The policy line will be the result of an interactive approach and become official national policy after having been approved by the Dutch Council of Ministers. Subsequently, including the policy line in a key planning decision or a (strategic) policy document may strengthen its legal basis.

There are several possibilities to give shape to **regional customisation** in a process-based manner. In current policy implementation, each tier of government prepares its own policy plans. Mutual co-ordination, in so far applicable, exists only between different policy areas addressed by one specific tier of government and between different tiers of government that are addressing the same policy area.

One possibility is to let regional partners elaborate national policy on their own. In this scenario, which is already being implemented using area-based plans, the directing role has been accorded to the provincial authorities. 'Diagonal' policymaking is a second possibility, which involves the integration of all existing policies applicable

to the various policy areas in a particular region – in this case the coastal area. All tiers of government work together to shape diagonal policy planning, including the national government in its role of policymaker and participant. Once again, the provincial authorities assume the role of director. Diagonal policy is already being implemented as well, partly in connection with the spatial planning and environmental areas (ROM areas) of the Nationaal Milieubeleidsplan (National Environmental Policy Plan) and the elaboration of the Vierde Nota over de Ruimtelijke Ordening (Fourth National Policy Document on Spatial Planning). One of the advantages offered by this approach is that it creates administrative support for eventual policy on all levels.

The underlying principle of diagonal policy is the process that leads from a joint vision to an implementation plan, which, in its turn, results in concrete projects. Examples of such projects in the coastal area include the mitigation of weak links and the efforts to bring about a quality boost and enhance risk management in coastal towns at the same time.

The last question is how to involve individuals and non-governmental organisations in coastal zone policymaking through **interactive planning**. Usually, these parties are not involved until the participation procedure. Real interactive planning starts at a later stage and can be integrated into existing structures.

At national level, the establishment of a National Coast Forum could be considered. The status and role of this National Coast Forum should be considered thoroughly. An alternative option are the 'polder model' or consensus-based consultations, which were also used for the purpose of the Fifth National Policy Document on Spatial Planning. In this model, the national government consults the parties involved and asks for their advice. Participants in these consultations are selected on the basis of the extent to which an organisation can contribute to achieving policy targets and whether the organisation has its own clear vision of the future infrastructure of the Netherlands.



# Epilogue

Not all of the solutions in this policy agenda have been elaborated to the same extent, given the varying complexity and urgency of the problems. Those associated with the weak links and spatial development in coastal towns are the most urgent. For this reason, solutions to these latter problems have been elaborated further. Their merits will be discussed in 2002.

Insufficient awareness among individuals and government authorities of coastal developments is considered less urgent than the two problems mentioned above. However, awareness is crucial to enable implementation of existing and future policy. Consistent and transparent policy enforcement could do as much to increase awareness as programmes specifically set up for that purpose.

An integrated approach to the various sectors and tiers of government is essential to enable credible and effective policy enforcement and, if necessary, new policy development. It is therefore encouraging to note that the parties involved in coastal policy are working together more frequently to develop visions, translate them into policy and implement them.

Coastal zone policy is addressed in both national policy documents and visions drafted by provincial authorities and flood defence management bodies, for example. The *Towards an Integrated Coastal Zone Policy* project has made an important contribution to the content of the Fifth National Policy Document on Spatial Planning and part 1 of the Second Structure Plan for the Rural Areas. As such, the interministerial co-operation initiated with *A Coastal Zone Perspective* has been continued in a satisfactory manner.

There are various possibilities to intensify this co-operation beyond the development of integrated coastal zone policy and plan studies for national programmes. *Towards an Integrated Coastal Zone Policy* has illustrated that co-operation between the

national government, provincial authorities, municipal authorities and water boards is improving, although the various responsibilities have to be more clearly defined.

Finally, the importance of another form of co-operation, viz. social alliances, should not be underestimated. The implementation of measures through public-private co-operation offers attractive prospects. More importantly, such alliances offer a great opportunity to generate more public support for the measures and developments required in the coastal zone.



**Erosion line**

This line identifies the part of a dune that will erode during a storm surge. For example, the '1:500 erosion line' identifies the boundaries of an area that would be eroded during a 500-year storm.

**Erosion zone**

The dune area that erodes during heavy storms.

**Ecologische Hoofdstructuur (EHS)**

National ecological network.

**Estuary**

An area of transition in which river and seawater meet. It is an ecologically important area due in part to the gradual transition between freshwater and salt water.

**EU**

European Union.

**Green contours**

The boundaries of areas in which examples of exceptional environmental, landscape, cultural and historic value are protected. Activities are only permitted within the green contours if they do not damage these areas.

**Water authority bye-law**

Regulations that provide for and prohibit activities that can impact the flood defence function, management and maintenance of sea defence structures.

**Engineering structure**

Man-made elements that do not comprise soil, sand or clay. Examples of these elements in the coastal defences include sluices and storm surge barriers. Dikes are considered earthworks.

**Coastal foundation zone**

An area that is key to flood defence for the low-lying areas of the Netherlands. Inland elements include the dunes and sea dikes. The offshore boundary follows the contour of the points lying at 20 metres below Amsterdam Ordnance Datum. In identifying the inland boundary, the worst-case scenario for the coming 200 years has been taken into consideration.

**Coastal town**

Built-up area that lies within or immediately behind dunes. A distinction is made between coastal towns with(out) a promenade and those with(out) built-up areas outside the dikes.

**Littoral drift**

Flows of silt and nutrient-rich water from the rivers and the Delta that move along the coast to the Wadden Sea.

**Precept document**

Document summarising the key requirements that flood defence structures must meet. It is adopted after the flood defence structure managers have had the opportunity to offer input.

**National landscape**

Area of exceptional environmental, cultural, historic and recreational value, which is important to the national ecological network and which is under pressure of urbanisation. The Fifth National Policy Document on Spatial Planning identifies seven national landscapes.

**Provinciaal Overlegorgaan voor de Kust (POK)**

Provincial Coast Consultation Body.

**Primary flood defence structure**

Flood defence that offers the area behind the dike ring the level of flood protection stipulated by law. For sandy flood defence structures, the primary flood defence structure comprises the nearshore, beach and dune area, including the reserve buffer.

**Reserve buffer**

The coastal zone required to ensure that the flood defence structure will continue to meet the safety standards with any rise in sea level in the next 200 years. This zone will be necessary for future adaptations of narrow flood defence structures.

**Risk zone**

The boundaries of these areas coincide with the erosion zones. No safety standards to prevent flooding of the dike ring area apply to these areas.

**Red contours**

The boundaries of the area that may be urbanised in the coming decade. The municipal authorities must cooperate to propose the exact outline of these contours within the target areas indicated by the Dutch government and provincial authorities.

**ROM areas**

Areas for which, in accordance with the Fourth National Policy Document on Spatial Planning, the various tiers of government, non-governmental organisations and individuals are generating solutions for spatial and environmental problems.

**Storm surge**

Instances in which flood water levels exceed a designated level. In Hook of Holland, for example, this water level is 255 centimetres. Flood water levels are exceeded once every 100 years.

**Technische Adviescommissie Waterkeringen (TAW)**

Technical Advisory Committee for Flood Defence Structures.

**Unie van Waterschappen (UvW)**

Association of Water Boards.

**Flood defence network**

Primary flood defence structure that closes off a sea inlet, such as the dams in the Delta area.

**Sand balance**

The difference between the amount of sand removed through erosion and added through siltation in a specific area. A 'negative sand balance' occurs if erosion exceeds siltation.

**Sand flow**

The flow of sand (also sometimes referred to as a 'river of sand') that runs parallel to the coast in a northerly direction, moving sand between the Westerscheldt river and the Wadden Sea.

**Weak link**

The components of sea defence structures that – assuming the high sea level rise scenario – will no longer meet the safety standards due to rising sea levels in the coming 200 years.



## LIST OF PRELIMINARY DOCUMENTS

The following documents were used in the preparation of this policy agenda:

- 1 *De Kust Verkend* (The Coast Explored). RIKZ report 2001.045 (2001). Kustbewust publication, no. 1.
- 2 *Huidige instrumenten voor implementatie van integraal kustzonebeleid* (Current instruments for the implementation of integrated coastal zone policy). Working document RIKZ/AB/2001.111x (2001). Kustbewust publication, no. 2.
- 3 *Nieuwe instrumenten voor implementatie van integraal kustzonebeleid* (New instruments for the implementation of integrated coastal zone policy). Working document RIKZ/AB/2001.110x (2001). Kustbewust publication, no. 3.
- 4 *Analyse zwakke schakels in de kustverdediging. Quick scan van kosten en baten van vier verbredingsstrategieën* (Analysis of the weak links in the coastal defences. Quick scan of the costs and benefits of four expansion strategies). Resource Analysis, RA/01-518 (2001). Kustbewust publication, no. 4.
- 5 *Afslagkaart Noordzeekust. Resultaten en achtergronden van verkennende afslagberekningen plus bijbehorende Kaartenatlas Noordzeekust* (Erosion map of the North Sea coast. Results and background information of the exploratory erosion calculations, accompanied by a map of the North Sea coast). Alkyon en Grontmij Geo Informatie. A801 (2001). Kustbewust publication, no. 5.
- 6 *Vergelijking van afslagrisico's kustzone met risico's elders in Nederland* (Comparing the risk of erosion along the coastal zone to risks elsewhere in the Netherlands). NEI, I7442 (2001). Kustbewust publication, no. 6.
- 7 *Indicatieve risicoberekeningen voor kustplaatsen aan de Noordzee* (Indicative risk calculations for coastal towns on the North Sea). P0479.10. HKV (2001). Kustbewust publication, no. 7.
- 8 *Ruimte voor de zandrivier. Een aanzet tot een morfologisch afwegingskader voor de Nederlandse kust* (Space for the river of sand. A step towards a morphological deliberation framework for the Dutch coast). Waterloopkundig Laboratorium. Z3200 (2001). Kustbewust publication, no. 8.
- 9 *Zeker zand: een schets van de Nederlandse kust* (Stable sand: A sketch of the Dutch coast). Kustbewust publication, no. 9.

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