Article, Published Version

**Nielen-Kiezebrink van, Marinka; Klooster, Jeroen**

# Evaluation of Policies and Strategies for Coastal Risk Management - COMRISK Subproject 1

Die Küste

Zur Verfügung gestellt in Kooperation mit/Provided in Cooperation with:
**Kuratorium für Forschung im Küsteningenieurwesen (KFKI)**



Die Küste, 70 (2005), COMRISK, 9-17

# Evaluation of Policies and Strategies for Coastal Risk Management COMRISK Subproject 1

MARINKA VAN NIELEN-KIEZEBRINK, JEROEN KLOOSTER


## Summary

40.000 square kilometres in the southern North Sea Region is potentially affected by flooding. In this area 16 million people live and work. The governments of the countries involved manage this risk. Comparing them, both their actions and their goals have differences as well as similarities.

This paper presents the results of an evaluation study of policies and strategies in the countries bordering the southern North Sea.

For the assessment a comprehensive analytical framework is used. In the framework a distinction between context and policy is made. Policy largely depends on context elements such as the history of flooding, the cultural, socio-economic setting, institutional setting, public awareness. Within each country specific context there is however a certain degree of policy freedom. This implies that countries can learn from each other. The observed differences between the countries offer opportunities and challenges to exchange experiences and information. They might even adopt part of each other's policies, strategies, measures or instruments within the country specific context and could even lead to common strategies. Defining common strategies and policies does not necessarily have to lead to harmonisation of policies.

Although future harmonisation of policies and strategies should not be avoided when desirable and feasible, policy makers have to focus on further mutual understanding and mutual learning.

## Zusammenfassung

*40.000 Quadratkilometer in der südlichen Nordseeregion sind potentiell überflutungsgefährdet. In diesem Raum leben und arbeiten 16 Millionen Menschen. Die Regierungen der betroffenen Länder gehen mit diesem Risiko um. Einen Vergleich zeigt, dass ihre Maßnahmen und Ziele Ähnlichkeiten und Unterschiede aufweisen.*

*In diesem Beitrag werden die Resultate einer Evaluierungsstudie über die Politiken und Strategien in den Nordsee-Anrainerstaaten präsentiert.*

*Für die Untersuchung wurde ein umfassendes Analyseverfahren benutzt. Dieses Verfahren unterscheidet zwischen Kontext und Politik bzw. Strategie. Die Strategie ist zum größten Teil abhängig vom Kontext, zum Beispiel von der Überflutungsgeschichte, den kulturellen, sozialen, wirtschaftlichen und institutionellen Rahmen sowie dem Problembewusstsein. Innerhalb dieses Kontextes existiert jedoch ein gewisser politischer Handlungsspielraum. Somit können die Länder voneinander lernen. Die beobachteten Unterschiede zwischen den Ländern bieten Chancen und Herausforderungen für einen Austausch von Erfahrungen und Informationen. Dies könnte eine teilweise Übernahme von Strategien, Maßnahmen oder Instrumenten innerhalb des eigenen Kontextes beinhalten bis hin zu gemeinsamen Strategien. Gemeinsame Strategien und Politiken zu definieren muss nicht zwangsweise zu einer Harmonisierung der Politiken führen.*

*Obwohl künftige Harmonisierung von Politiken und Strategien nicht vermieden werden sollten wenn sie wünschenswert und machbar ist, sollte der Fokus auf dem Vorantreiben des gegenseitigen Verständnisses und dem Lernen voneinander liegen.*



## Keywords

Coast, risk management, flood defence, risk strategies

## Contents



## 1. Introduction

40.000 square kilometres in the southern North Sea Region is potentially affected by flooding (figure 1). In this area 16 million people live and work. The governments of the countries involved try to manage this risk. Both their actions and their goals have differences as well as similarities.

The concept of coastal flood risk management was derived from safety science theory (KIRWAN et al., 2002). Risk is a combination of the probability (or frequency) of occurrence of a defined hazard and the magnitude of the consequences of the occurrence. It is not necessarily a number.

Risk management is the process of implementing decisions about accepting or altering risk, based on an assessment of various costs and benefits. This also implies decisions about acceptable risk levels and appropriate measures.

In applying risk management to the field of coastal flood risk management the following steps are identified:

- Identification of the nature and extent of flood risks;
- Understanding and addressing the relevant public perceptions;
- Establishing goals and standards with respect to the flood risk;
- Establishing strategies and policies to achieve these goals;
- Finally minimizing the costs of achieving the goals, whilst ensuring the risk remains acceptable.

On behalf of the Rijkswaterstaat Dutch National Institute for Coastal and Marine Management / RIKZ, a consortium of KPMG Strategy Economics, Atos KPMG Consulting and TU Delft carried out an evaluation of policies and strategies for coastal risk management (KLOOSTER en VAN RAAK, 2004). This paper presents the results of this evaluation study.

For this evaluation the following specific objectives were formulated:

- An inventory of different levels (strategic, institutional, instrumental and operational) of coastal risk management in present national policies of the 5 countries in the North Sea region, involved in the COMRISK project.
- An assessment of the present national policies in terms of legal, social, technical, financial, socio-economic, ecological and managerial aspects (including the ICZM-principles for sustainability).

## 2. Methodology: context versus policies

The strategies and policies of the countries involved were identified, reviewed and compared within an analytical framework.

For the inventory national policy documents and a selection of documents of lower governments relevant to coastal, flood risk and water management were studied. In addition,

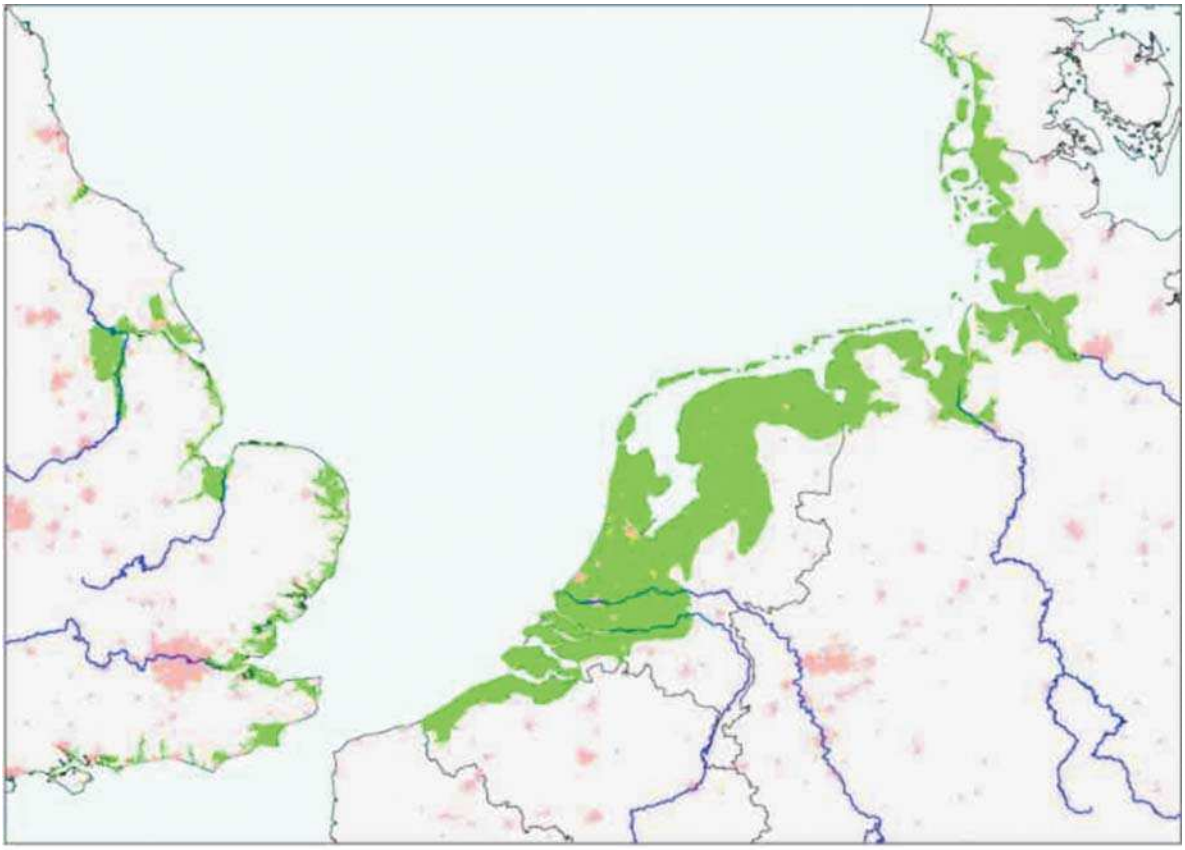

Fig. 1: Flood prone area in the North Sea region (source: JORISSEN et al., 2001)

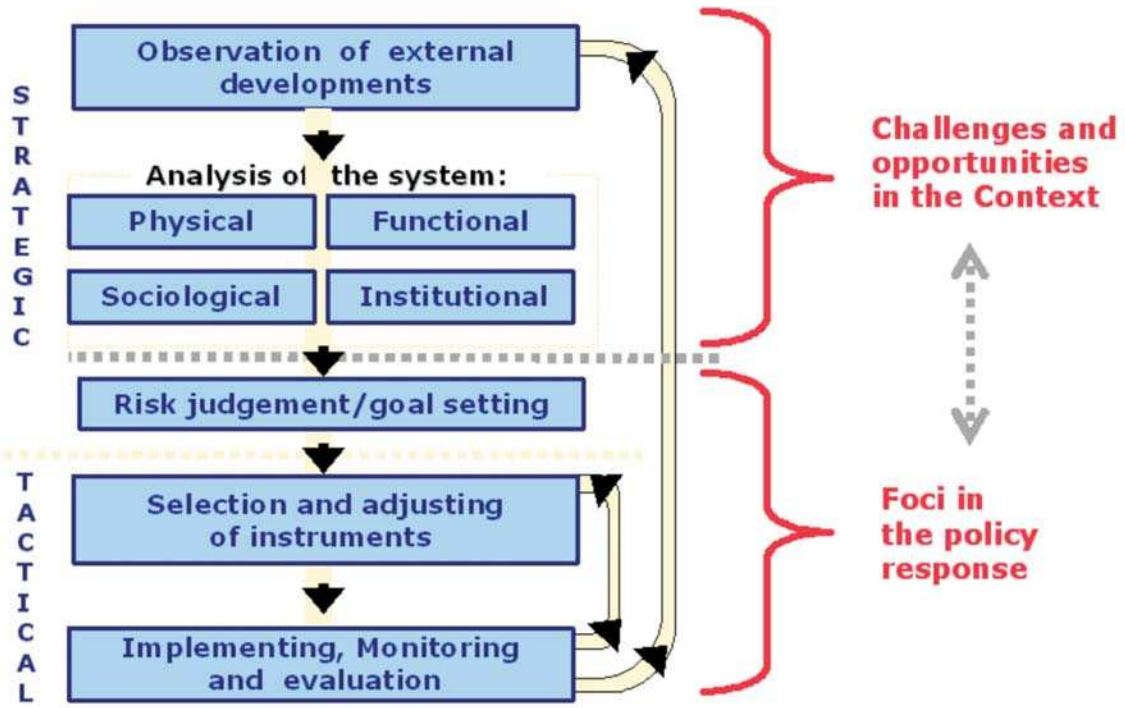


Fig. 2: Analytical framework

earlier cross-country studies into North West European flood risk management and coastal management were studied. To fill specific information gaps and to find the motivation behind the policies, 25 interviews with coastal flood risk policy-makers and experts were held.

The analytical framework (figure 2) distinguishes between the *context* and *policy*. The *context* comprises the important challenges that governments in the regions face in relation to the management of the risk of flooding from the sea. Challenges can be threats to be confronted or avoided, but may also be opportunities to be explored and possibly exploited.

Governments develop *policies* to manage the risk of flooding within the country specific context but may not be able to influence the context directly. Depending on the socio-economic and socio-cultural setting, countries may adopt different forms of coastal risk management policies. For this reason we have refrained from taking one country as 'best practice' or to speak of *the* optimal coastal risk management process, as this will differ from country to country, to fit the particular context.

The key focal points within a policy can, however, be indicated. For this purpose the ICZM-criteria as formulated by the European Commission are used as a startingpoint. These principles offer various ways of good coastal zone management. The EU-ICZM principles however are formulated at quite a high and abstract level. Furthermore they relate to both the institutional structure and to the policy of coastal management. To make the ICZM principles more concrete, they are translated to possible focus points for coastal risk management.

The results of the assessments are discussed in the following sections and summarized in table 1, 2 and 3. The challenges in context and focuses in policies are indicated with dots in table 1 and 2. A black dot indicates a major challenge or focus and an open dot indicates significant challenges or focuses.

## 3. Challenges in the context

The challenges experienced by the governmensts in the 5 North Sea countries in relation to the risks of flooding from the sea are summarized in table 1.

All countries regard climate change and the corresponding sea level rise as major challenge (table 1). Keeping this in mind, the Dutch physical context is both in absolute and relative terms the most challenging, although it has some protective dunes, it has the largest and deepest floodprone areas (polders) of all countries. To make things even more urgent the Netherlands major cities are situated in flood-prone areas. The German coastline offers the least natural protection, but the hinterland has much smaller and less deep floodprone areas. The major city of Hamburg is partly situated in one of them. Also London is partially located in one of Englands floodprone areas. Development pressure is a major issue for the Netherlands and England, but less so in the other countries.

Ecological regulation is a complicating factor to policy-making, but in most cases not regarded as a major challenge to the existing policy. Policymakers in almost all regions are confronted with sensitive natural habitats at their coast, which brings limitations and conditions to coastal defences.

The common challenge for policy-makers in England, Flanders, the Netherlands and to a lesser extent Niedersachsen, is to raise the sense of urgency among their citizens to make them either support governmental action or take action themselves. In Schleswig-Holstein, citizens are also noted not to be very aware of the risk of flooding, but this has not lead to practical difficulties in implementing policy. Hamburg and Denmark in general feel that the demand and support for action is about right.

Table 1: Challenges in the context

| | England | Flanders | Nether-lands | Nieder-sachsen | Hamburg | Schlesw. Holstein | Den-mark |
|---|---|---|---|---|---|---|---|
| **Challenges from external developments** | | | | | | | |
| Relative sea level rise | ● | ● | ● | ● | ● | ● | ● |
| Ecological regulation | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Pressure for development | ● | ○ | ● | | ○ | | |
| **Physical opportunities and threats** | | | | | | | |
| Large amount of flood-prone area | ○ | ○ | ● | ○ | ○ | ○ | |
| Deep flood-prone areas | ○ | ○ | ● | ○ | ○ | ○ | |
| Natural coastline offers little protection | ○ | | ○ | ● | | ● | ○ |
| **Challenges from the socio-economic functions** | | | | | | | |
| Major cities threatened | ○ | ○ | ● | | ○ | | |
| Designated nature areas | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **Challenges from societal perceptions** | | | | | | | |
| Low sense of urgency citizens | ○ | ● | ● | ○ | | * | |
| **Challenges from the institutional context** | | | | | | | |
| Limited staff capacity | | ● | | | | | |
| Limited budget | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| Limited relation to disaster management policy | | ○ | * | | | | |
| Limited relation to spatial planning policy | | ○ | ○ | | | | |
| Limited vertical integration | ** | | ○ | | | | |

● Major challenge ○ Challenge
* Limited relation, but not regarded as a problem;
** According to the local level, there is a policy vacuum

Limited budgets is a common challenge for policy makers in all countries. The challenge of integrating of policy across different fields and at different scales, is more ambiguous. In some cases policy integration is not strong, but often the primary policy-makers do not consider this as a major problem. The vertical integration in England has improved according to all interviewees, however at the local level a 'national policy vacuum' was reported by some.

## 4. Focus points in policies and strategies

Different countries focus on different aspects of policies and strategies in order to manage the risks of coastal flooding. These 'focus points' are summarized in table 2. The potential focus points are derived from the ICZM criteria. In some respects they also relate to the organisation of flood risk management.

With respect to goal-setting, England and the Netherlands have a multi-generation time horizon in common. Both countries have explored the long-term demands for coastal pro-

Table 2: Focus points policies and strategies

| | England | Flanders | Netherlands | Niedersachsen | Hamburg | Schlesw. Holstein | Denmark |
|---|---|---|---|---|---|---|---|
| **Goal-setting** | | | | | | | |
| Taking into account the needs of many generations | ● | | ● | | | | |
| Economical costs and benefits taken into account | ● | | ○ | ○ | ○ | ○ | ○ |
| Ecological carrying capacity taken into account | ● | ○ | ○ | ○ | ○ | ○ | ○ |
| **Focus points in measures** | | | | | | | |
| Allowing dynamics | ● | ○ | ○ | | | | ○ |
| Allowance of local tailor-made solutions | ● | ● | ● | | ○ | | ● |
| Variety of measures | ● | | | | ○ | | ● |
| Variety of methods to achieve measures | ● | | ○ | | ○ | | ● |
| **Monitoring and evaluation** | | | | | | | |
| Performance monitoring of measures | ○ | ● | ● | ● | ● | ● | ● |
| Reconsideration at strategic level | ● | ○ | ○ | | | | |

● Major focus ○ Some focus

tection. The other countries generally have limited themselves to study how – in the long run – the current level of protection could be maintained.

England has a strong focus on costs and benefits; for every project a benefit/cost ratio is calculated. In the Netherlands and Denmark current safety standards were set decades ago with much consideration to costs and benefits. These are currently being updated. Hamburg and Niedersachsen (in the Weser-Ems region) take some account of potential damages. However, since the dike design regulation does not allow for variable protection levels, this aspect cannot be directly incorporated in decision-making. Schleswig-Holstein however has incorporated this type of information in setting priorities in implementation of measures: locations with highest monetary or other value are first on the list. The way the ecological carrying capacity is taken into account is quite similar in all countries, as EU law regulates matters such as the Environmental Impact Assessments and the protection of habitats.

The allowance of dynamics of the coast is very much connected to erosion policy, which is outside the scope of this study. England allows largely for dynamics, including the setting back of dike lines. In Flanders, the Netherlands, Niedersachsen (for the islands) and Denmark some dynamics are allowed, though in general the currently protected areas will remain protected. In Germany a retreat policy for the main land might be followed in exceptional cases.

England has permissive legislation, like Denmark. National governments in these countries have the right to fund measures, if budgets allow, and if justified. They also give policy and procedural guidance to lower governments and operating authorities. However there is no legal duty to take action. Denmark and England thus place much emphasis on the initiative and freedom of the counties and boards, whereas the Niedersachsen high level policy is strictly prescribing and local policy-making is limited. The Schleswig-Holstein high level po-

licy-maker leaves freedom to the water boards with regard to the secondary dikes. Hamburg is itself practically a local authority and also leaves freedom to industry areas to arrange their own protection measures. In the Netherlands and Flanders standards are set at the central level. However local 'tailoring' is receiving more and more attention. Alternatives to reach the safety standard are discussed with local communities and municipalities. The difference in the role of authorities in England and the Netherlands is well illustrated with fig. 2.

As pointed out, England, Denmark and to some lesser extent Hamburg use a variety of measures to manage the risk of flooding from the sea (see also table 3). Besides coastal protection these authorities also take acount of the possible consequences of flooding more explicitly than Flanders, the Netherlands and the other German states, which concentrate mostly on coastal defence. The Netherlands, though focused on coastal defence, is also more and more searching for more holistic approaches to managing coastal risks.

With respect to monitoring and evaluation all countries try to improve their actions by learning about their performance. However, only few countries are reconsidering their general set of goals and measures or have done so recently (England, Flanders and the Netherlands).

**"They [the authorities] take measures in order to keep the Netherlands safe in the future."**

- www.nederlandleeftmetwater.nl (translated)


- www.environment-agency.co.uk/floodline

Fig. 3: Differences in the role of authorities in the Netherlands and England in relation to flood risk management as illustrated by public communications

Table 3: Selection of instruments with respect to point of intervention.

| Point of intervention | Instruments | | England | Flanders | Netherlands | Niedersachsen | Hamburg | Schlesw.-Holstein | Denmark |
|---|---|---|---|---|---|---|---|---|---|
| Reduction of probability of flooding | Coastal flood protection | Primary sea defences | ● | ● | ● | ● | ● | ● | ● |
| | | Secondary sea defences | | | • | ● | ● | ● | • |
| | | Prepare for emergency strengthening | ● | • | ● | ● | ● | ● | |
| Reduction of consequences of flooding | Avoid development in flood prone areas* | | ● | | ● | ● | ● | ● | • |
| | Flood resistant building | | ● | | | | • | • | ● |
| | Crisis management | Forecasting and warning | ● | ● | ● | ● | ● | ● | ● |
| | | Evacuation and rescue operations | ● | • | ● | ● | ● | ● | ● |
| | Recovery | Prepare to restore land and infrastructure | ● | | | | | | ● |
| Compensation | Recovery | Redistribution of costs or damages | ● | ● | • | • | • | • | ● |

• Used limited, considered unimportant; ● Used, considered of some importance

● Used, considered important; ● Used, considered crucial

*) The Netherlands, Schleswig-Holstein, Niedersachsen en Flanders only have restrictions for building in the first (or first few) 100 m of dunes. Denmark applies a wider zone, related tot protection of the landscape.

## 5. Conclusions and recommendations

The concept of flood risk management – optimizing both the probablities and the consequences of flooding – is emerging in all five countries in the North Sea region, although in some countries more pronounced than others. In England and Denmark governments have chosen more points for intervention than for instance in the Netherlands and Germany, where focus is mainly on prevention of flooding. The actual translation of the concept of risk management into formalized policies and strategies has not happened in all countries and might face some serious obstacles. For example in Germany, where according to national regulations, every inhabitant has the right to the same level of protection against flooding. Harmonization on all aspects of coastal flood risk management does not seem to be feasable due to the differences in the contexts and approaches in the five countries, which are in some cases (the Netherlands, Germany) even laid down in national legislation. Definition of a common strategy however does not have to mean harmonization of policies. Although future harmonisation of policies and strategies should not be avoided when desirable and feasible,

at the moment it is more appropoiate to focus on further mutual understanding and mutual learning. Elements that seem especially interesting in this respect include: public awareness in relation to responsibility of acting (government versus 'self acting' of individuals), insurance versus compensation, evacuation and crisis management.

## 6. Literature

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