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COMRISK

Common Strategies to Reduce the Risk of Storm Floods in Coastal Lowlands: an Introduction

JACOBUS HOFSTEDÉ

Summary

Storm surges present a major natural hazard in the North Sea region. In this region, coastal lowlands occupy an area of about 40,000 km². More than 16 million people live here, and major economic activities take place. Without appropriate defence measures these lowlands may become flooded during severe storm surges. In order to achieve a sharing of knowledge and a sustainable approach on coastal risk management, the North Sea Coastal Management Group decided in 2002 to initiate a transnational project: "COMRISK – common strategies to reduce the risk of storm floods in coastal lowlands". The project was co-financed by the European Union under its INTERREG IIIB programme for the North Sea region. This paper introduces the project that ran from July 2002 till June 2005 as an example of international co-operation of coastal risk management authorities.

Zusammenfassung

Sturmfluten stellen eine wesentliche Naturgefahr in der Nordseeregion dar. In den etwa 40.000 km² großen Küstenniederungen leben über 16 Millionen Menschen und sind viele wirtschaftliche Aktivitäten konzentriert. Ohne Küstenschutzmaßnahmen könnten die Niederungen bei jeder extremen Sturmflut überschwemmt werden. Im Jahre 2002 initiierte die „North Sea Coastal Managers Group“ ein transnationales Projekt: „COMRISK – gemeinsame Strategien zur Reduzierung der Risiken von Sturmfluten in Küstenniederungen“ mit dem Ziel, mittels einem Austausch von Erfahrungen und Erkenntnissen nachhaltige Verfahren für das Management von Küstenrisiken aufzuzeigen. Das Projekt wurde von der Europäischen Union im Rahmen des INTERREG IIIB Programms für die Nordseeregion kofinanziert. In diesem Beitrag wird das vom Juli 2002 bis Juni 2005 laufende Projekt als Beispiel für eine internationale Zusammenarbeit von Küstenschutzverwaltungen vorgestellt.

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Keywords

Coast, risk management, flood defence, international cooperation, storm surges, INTERREG

1. Introduction

Storm surges present a major natural hazard in the North Sea region (NSR). In this region, coastal lowlands occupy an area of about 40,000 km² (Fig. 1). More than 16 million people live here, and major economic activities take place. Without appropriate counter-measures, these lowlands may become flooded during severe storm surges. To prevent this, national Governments spend several hundred million Euros per year on coastal defence or, rather, coastal risk management in the NSR. In future, with an accelerating sea level rise and changes in storminess (IPCC, 2001), the necessary budget to maintain present safety standards might increase significantly (CPSL, 2001; Office of Science and Technology, 2004). Apart perhaps from Bangladesh, in no other region in the world the potential losses (lives and assets) resulting from storm surges or, rather, coastal flooding are higher. The fact that this is not so much “in the peoples mind” may result from the success of coastal risk management. The last catastrophic storm floods occurred in 1953 in the Netherlands and England, and in 1962 in Germany. In all, more than 2,400 people lost their lives. After these catastrophes, national governments undertook huge efforts to improve the safety standards, in the Netherlands by the so-called “Deltawerken”. The risk of coastal flooding was significantly reduced, but still existent. For example, in Hamburg storm surge water levels of up to 0.8 m higher than in 1962 have been observed, but no major damage occurred. As a result, people feel safe in coastal lowlands and may be tempted to ignore the latent hazards.

In the year 1996, on the initiative of the Danish Kystdirektoratet, leading national and regional coastal risk management authorities in the Netherlands, Belgium, the UK, Ger-



Fig. 1: Coastal flood-prone areas (green) in the southern North Sea region (Source: JORISSEN et al., 2001)

many and Denmark started an informal network, the North Sea Coastal Managers Group (NSCMG). Basic idea was an improved international co-operation and co-ordination of transnational issues on coastal risk management, including the economics of beach nourishment, the improvement of public awareness and EU-regulations. Later, topics like coastal risk management strategies, climate change and research in coastal engineering, were introduced. Each year, small national delegations of senior public officers and managers meet in one of the member states to discuss common issues. From these meetings it became clear that, in order to achieve a sharing of knowledge and a balanced approach, a more comprehensive co-operation about coastal risk management throughout the NSR is desired. On the basis of these considerations, the idea for a NSCMG project: "COMRISK – Common strategies to reduce the risk of storm floods in coastal lowlands" was born.

Under the Community Initiative Program INTERREG IIIB the European Union co-finances (with 50 %) transnational projects for specific regions like the North Sea region. Program targets for the NSR are, amongst others: (1) improved compatibility of spatial planning and strategies at transnational level, (2) increased transnational co-operation through networks and studies, and (3) strengthen the cohesion and identity of the NSR through common approaches. One of the themes, under which projects may run, is called: "Risk management strategies for coastal areas prone to disasters and natural threats and for the North Sea". Hence, INTERREG IIIB constituted an optimal umbrella for the NSCMG to organise the project.

2. The project

COMRISK was an INTERREG IIIB project that ran from July 2002 to June 2005 with a total budget of 1.84 million Euros (50 % co-financing by the EU, 50 % national matching funds). The project was conducted by a consortium of seven public coastal risk management authorities in the NSR: Coastal Defence Division of the Schleswig-Holstein State Ministry of the Interior (GER, lead partner), Lower Saxony Water Management, Coastal Defence and Nature Protection Agency (GER), Coastal Authority of the Danish Ministry of Transport (DK), Coastal Waterways Division of the Belgian Ministry of the Flemish Community, Waterways and Maritime Affairs (B), Rijkswaterstaat National Institute for Coastal and Marine Management of the Dutch Ministry of Transport, Public Works and Water Management (NL), Rijkswaterstaat Road and Hydraulic Engineering Division of the Dutch Ministry of Transport, Public Works and Water Management (NL), and Centre for Risk and Forecasting of the Environment Agency of England and Wales (UK).

The overall impact that COMRISK wants to achieve is ensuring a sustainable, harmonious and balanced development in the coastal lowlands of the NSR. For this, an adequate and sustainable coastal risk management is a prerequisite. Risk is a combination of the probability (or frequency) of occurrence of a defined hazard (e.g., a storm flood) and the magnitude of the consequences (e.g., casualties, damages to properties) of the occurrence. Thus, COMRISK aimed at improved coastal risk management through a transfer and evaluation of knowledge and methods as well as pilot studies. The project was divided into two main parts, the umbrella project and nine subprojects. The umbrella project focused on an exchange of experience and on the co-ordination and integration of the subprojects. It had the following objectives: (1) to bring together coastal risk management experts from administration, science and private companies from around the North Sea and beyond, (2) to exchange experiences and studies of good practise on coastal risk management, (3) to evaluate and further develop

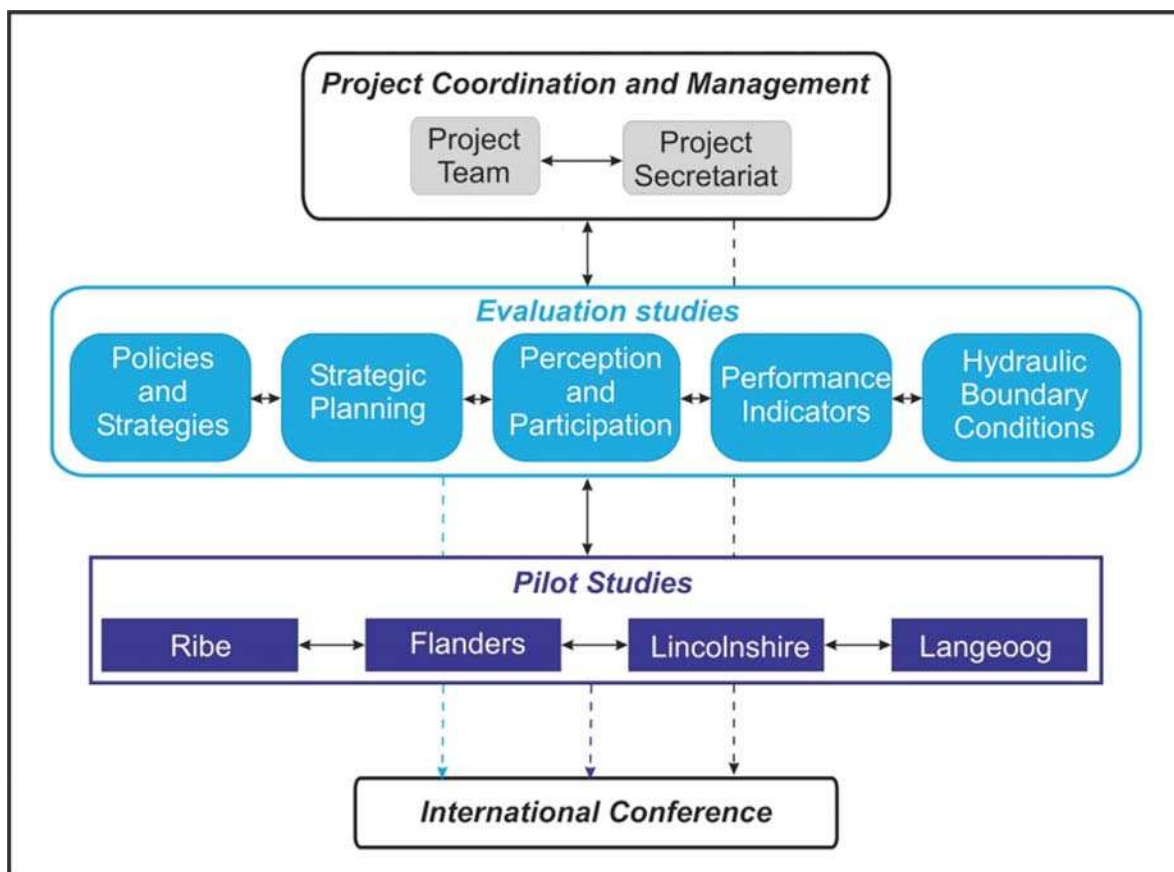


Fig. 2: COMRISK flow diagram

innovative integrated coastal risk management strategies, considering national regulations and responsibilities, (4) to initiate and support transnational co-operation on integrated coastal risk management (networking), and (5) to integrate coastal risk management into strategies for a sustainable management of the coastal zones in the North Sea Region (ICZM).

The project was divided into three phases. The first (starting-up) phase concentrated on the substantiation of the project structure (Fig. 2). During this phase, a project secretariat was established within the lead partners institute and a project manager: M. HAMANN (till December 2003), D. WITZKI (from April 2004) appointed. Further, a project team with representatives from the partner institutes was installed. It consisted of the following persons: T. VERWAEST (B), M. F. VAN NIELEN-KIEZEBRINK (NL), S. FRAIKIN (NL), A. WOLTERS (NL), C. LAUSTRUP (DK), T. PIONTKOWITZ (DK), I. MEADOWCROFT (UK), S. HAYMAN (UK), F. THORENZ (GER), H. BLUM (GER) and J. HOFSTEDE (GER, project leader). During the second (main) phase, the pilot and evaluation studies were conducted. Part of the work in these studies was carried out by subcontractors. In order to involve external experts as well as local authorities, 7 expert workshops were organised and 2 permanent contact groups established within pilot studies. Main activities during the last phase were the organisation of the final conference COMRISK2005 (see below), and the synthesis of the subprojects.

In all, about 30 organisations (partners, consultants, local administrations, etc.) were directly involved in the project. More than 40 individuals (project team, consultants and contact groups) actively contributed to the project outcomes, and about 150 more persons were involved through workshops, expert questionnaires, etc.

2.1 The subprojects

The nine subprojects (five evaluation and four pilot studies, Fig. 2) contributed to the general project objectives (see above), each having one thematic or regional focus. The subprojects are described in detail in the following chapters of this volume. As an introduction, the main activities of the subprojects are described below.

In subproject one, the national and regional policies and strategies for coastal risk management were evaluated in terms of sustainability and with respect to their contexts. After an inventory of national policies and strategies, an evaluation in terms of their ability to promote a socio-economic and ecological sustainable development was conducted. The responsibility for this subproject is with the Rijkswaterstaat National Institute for Coastal and Marine Management of the Dutch Ministry of Transport, Public Works and Water Management.

Subproject two focused on common strategic planning tools for coastal risk management. On the basis of an inventory of non-technical strategic tools and techniques for planners and risk managers, an evaluation of different approaches taken in terms of their ability to answer the need of risk managers and strategic planners was conducted. The responsibility for this subproject is with the Centre for Risk and Forecasting of the Environment Agency of England and Wales.

In subproject three, a comparative assessment and evaluation of the present state of public perception and participation in coastal risk management in the participating countries was conducted. Further, a more general assessment and evaluation of methods for public participation in coastal risk management was carried out. The responsibility for this subproject is with the Coastal Defence Division of the Schleswig-Holstein State Ministry of the Interior.

In subproject four performance indicators for coastal risk management were investigated. After an inventory of currently applied technical and non-technical performance indicators in the NSR, an evaluation in terms of the ability of different approaches to answer the needs of risk managers and planners was carried out. The responsibility for this subproject lay is the Centre for Risk and Forecasting of the Environment Agency of England and Wales.

In subproject five, an inventory of presently applied hydraulic boundary conditions and safety standards (as a follow-up of an earlier NSCMG-study; JORISSEN *et al.*, 2001) was established. In a next step, for two case sites in the Netherlands, the different national and regional methods to achieve the hydraulic boundary conditions were tested. The responsibility for this subproject is with the Rijkswaterstaat Road and Hydraulic Engineering Division of the Dutch Ministry of Transport, Public Works and Water Management.

In the subprojects six, seven, eight and nine, state of the art risk analyses were conducted for several pilot areas (Flanders, Ribe, Lincshore and Langeoog) in the NSR. Based on integral inventories of physical and socio-economic conditions as well as existing coastal defence measures, risk assessments using newest techniques were carried out. The responsibility for these subprojects lay with the Coastal Waterways Division of the Belgian Ministry of the Flemish Community, Waterways and Maritime Affairs (Flanders), the Coastal Authority of the Danish Ministry of Transport (Ribe), the Centre for Risk and Forecasting of the Environment Agency of England and Wales (Lincshore), and the Lower Saxony Water Management, Coastal Defence and Nature Protection Agency (Langeoog).

3. The final conference COMRISK2005

In April 2005, a three day international conference on coastal risk management “COMRISK2005” was organised in Kiel, Germany. The conference ran under the auspices of the North Sea Coastal Managers Group. In all, 85 representatives from science and administration participated in the conference (GER 37, NL 19, UK 11, B 9, DK 8, and USA 1). After welcoming addresses by the Schleswig-Holstein State Government, the North Sea Coastal Managers Group and the INTERREG IIIB Secretariat for the North Sea region, the conference theme was introduced to the audience in two key note presentations (see contributions OUMERACI and ALE in this volume). In six sessions, the results of the COMRISK sub-projects were presented and discussed:

- 1) Hydraulic boundary conditions in the context of risk analysis
- 2) Risk analyses Flanders (B/NL) and Lincshore (UK).
- 3) Risk analyses Ribe (DK) and Langeoog (GER).
- 4) Managing coastal risk and performance.
- 5) Coastal risk perception and participation.
- 6) Coastal risk policies and strategies.

In two further sessions, researchers presented relevant project-external results. In a final session, several technical, managerial and policy level statements that were prepared by the organising COMRISK project team were presented and discussed (see contribution HOFSTEDE *et al.* in this volume). The conference ended with a boat excursion to the Probstei sea wall, the largest coastal risk management measure in the Baltic Sea.



Fig. 3: Discussion of project results during COMRISK2005

4. Literature

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