

Strengthening a stretch of coastline and improving the spatial quality, west Zeeuws Vlaanderen - NL

1. Policy Objective & Theme

- ADAPTATION TO RISK: Managing impacts of climate change and safeguarding resilience of coasts/coastal systems
- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- ADAPTATION TO RISK: Integrating coherent strategies covering the risk-dimension (prevention to response) into planning and investment
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space

2. Key Approaches

- Integration
- Participation
- Ecosystems based approach
- Technical

3. Experiences that can be exchanged

Different and innovative techniques to protect the coastline and enhance both nature values and improve socio-economic well-being through augmenting tourism.

4. Overview of the case

In south west Netherlands, a 14 km stretch of coastline is being protected to allow for a flooding risk of once in 4000 years. The coast has been divided into five sections and different protection measures have been employed for each dependent upon the particular needs and uses of the coastline.

5. Context and Objectives

a) Context

In the Netherlands, coastal defences must legally be able to withstand one strong storm event every 4000 years. Ten weak points (zwakke schakels) have been identified which do not satisfy this requirement. Eight of them have been prioritised and two of these lie in Zeeland, one of which is a 14 km. stretch of coastline lying along the west coast of Zeeuws Vlaanderen, in the south west of the country. This means that these weak areas must be strengthened between now and 2020 in order to withstand the anticipated sea level rise due to climate change. The implementation of the whole programme began in 2007.

The work is not only aimed at strengthening the coast. It also addresses the spatial quality of the coaste.g. recreation, socio-economic activities (housing) and nature and, where possible, local entrepreneurial initiatives have been taken on board. The defence emphasis is now on 'soft' solutions because more dunes equals more space for nature and recreation. The Zeeuws Vlaanderen coast has been divided into five separate sections and each is being approached differently, the defence method being used best fitting the particular characteristics of the area. The end result will be not only a safe shore but a attractive and viable coastal area where nature has the opportunity to develop.

b) Objectives

The West Zeeuws Vlaanderen coast needed to be strengthened by 2015 to meet the Dutch legal requirement.

6. Implementation of the ICZM Approach (i.e. management, tools, resources)

a) Management

The waterboard of Zeeuws Vlaanderen is the manager of the dykes and dunes and has responsibility for the strengthening of the dykes. Because of the size of the task, a project bureau called Weak Link Zeeuws Vlaanderen has been set up so that the different, involved organisations work together to strengthen the coast to area-specific requirements.

b) ICZM tools

The five areas of the coastline are (south to north):-

Cadzand: where sand will be used to strengthen seawards together with strengthening the jetties and the dam area west of a pumping station. It will strengthen the character of the town as a resort by broadening the sandy beach. The anticipated cost is €22 million.

Herdijkte Zwarte Polder: where most strengthening will be done seawards but in conjunction with the construction of a breakwater to prevent further silting of the Drowned Black Polder. These two polders are part of a larger Natura 2000 area and thus important nature areas. They are well-loved by walkers and the defence works will increase the dune area. The anticipated cost is €11 million.

Nieuwvliet-Groede: where there will be a full reinforcement with sand on the seaward side to a distance of 50m. New dunes 60m wide will also be created providing 13ha. additional protection alongside the existing dyke using 3 million m³ sand. Work is expected to be completed by December 2009. Special measures are being taken to protect one nationally protected plant (the sea holly): the top layer of sand containing the seeds of the plant will be collected and stored and re-laid on the newly fashioned dykes. The anticipated cost is €30 million.

Waterdunen: where new dunes will be created landwards. This area has been treated separately from the others in a more area-integrated approach. The quality of the landscape will be improved by the development of new salt marshes and mud flats and increasing tourism possibilities in the form of a camping site, hotel and vacation houses to give a socio-economic impulse. The anticipated cost is €42 million.

Breskens: a town and resort, where a traditional raising of the dyke, by 2 m., will be done as a deep shipping route prevents seawards expansion and the town prevents landwards protection. The dykes will also be widened slightly. It is hoped to pave the top of the dyke for walkers and cyclists. The anticipated cost is €24 million.

So far two environmental impact assessments (EIA) have been prepared, one for Waterdunen (in 2007) and the other for the rest of the coastline (in 2009). The initiatives have been accommodated in the area plan "Natural Living" for West Zeeuws Vlaanderen and by the national Flood Programme.

New, experimental methods of protection are also being designed for use. In the area Nieuwvliet-Groede, a so-called "Sand Engine" will provide a reservoir of ca. 200,000t of sand, in one place, being part of the 2.2 million m³ total sand required for suppletion. This innovative form of sand suppletion is being used for the first time. The idea is that the sand will be gradually eroded north-eastwards, naturally over a four to five year period carrying the eroded sand from this fixed point along the coastline to supplete those areas which would otherwise need to be supplented mechanically. One advantage of this technique is that it can better protect the flora and fauna along the coast. It even has the potential to be used as a tourist attraction. All the sand is shipped from sites ca. 55km from the shoreline.

The current planning is: 2009: Nieuwvliet-Groede, 2010: Herdijkte Zwarte Polder, 2011 - 2012: Waterdunen, 2013: Cadzand-Bad, 2014: Breskens

7. Cost and resources

€130 million has been estimated for the complete works.

8. Effectiveness (i.e. were the foreseen goals/objectives of the work reached?)

So far the planning and implementation schedule is on target.

9. Success and Fail factors

Communication with all the involved partners had been the biggest challenge, in particular informing and involving the local inhabitants. This has been accomplished in a number of creative ways e.g. the students of one of the schools was requested to design a lookout tower. The EIA and cost benefit analysis were also both considered important tools. The design for Waterdunen was further inspired by the recreational and nature area of Marquenterre in northern France as well as the Schelde work at Lippenbroek and Kruikeke.

10. Unforeseen outcomes

None so far.

11. Prepared by










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12. Verified by

It has not been possible to verify this case.

13. Sources

- Kustversterkingsplan Waterdunen Kustversterking in de Jong- en Oud-Breskenspolder (2008) provincie Zeeland, waterschap Zeeuws-Vlaanderen
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- www.helpdeskwater.nl
- www.waterdunen.com
- www.wszv.nl
- Zandmotor Zeeuwsch-Vlaanderen (2008) Waterboard Zeeuws-Vlaanderen
- Zwakke Schakel West Zeeuws-Vlaanderen (undated) Waterboard Zeeuws-Vlaanderen

	Maatschappelijke kosten baten analyse (483.12 KB)	
	kust versterkingsplan west zeeuwse vlaanderen (9.17 MB)	
	kustversterkingsplan waterdunen (2.24 MB)	
	uitvoering kustversterking Nieuwvliet-Groede zeeuwse vlaanderen 2 (3.21 MB)	
	zandmotor wzv (6.25 MB)	
	zwakke schakel west zeeuwse vlaanderen (1.2 MB)	