

Restoration of an island landscape, Tiengemeten - NL

1. Policy Objective & Theme

- ADAPTATION TO RISK: Managing impacts of climate change and safeguarding resilience of coasts/coastal systems
- SUSTAINABLE USE OF RESOURCES: Preserving coastal environment (its functioning and integrity) to share space

2. Key Approaches

- Integration
- Participation
- Socio-economic
- Technical

3. Experiences that can be exchanged

The restoration of a large agricultural area to a natural, wetland and wooded area suitable for wildlife and recreation.

4. Overview of the case

A 1000 ha. island has been restored from centuries of use as agricultural farmland to a natural area for Nature and human visitors.

5. Context and Objectives

a) Context

Tiengemeten is a 1000 ha. island lying in the estuary of the Haringvliet estuary in the Dutch Rhine-Maas delta, just south of Rotterdam. Between 1705 and 2005, it was predominantly agricultural (700 ha.), with potato and beet crops surrounded by about 300 ha of reed and shrub vegetation. After the disastrous floods of 1953, the Netherlands embarked on the construction of the Delta Works. Dykes were strengthened and storm barriers were built to keep the sea out. The land is now well protected against the threat of floods, but the tidal nature that was common in the south-west part of the Netherlands has almost disappeared. The same is true along the Haringvliet estuary. Before the Haringvliet was closed off from the open sea in 1970, there was a two-metre difference between high and low tide and the environment was saline. Since the closure, the tidal range has shrunk to 30 centimetres and there is now a freshwater environment. The number of types of fish in the Haringvliet has halved, from 95 to 49 species. This had serious consequences for the vegetation and fauna of the Haringvliet. The intertidal surface area with its characteristic mud flats and salt marshes shrank as the ecological gradients disappeared. Numbers of estuarine and marine species have declined dramatically. Migratory fish, such as shad, have all but disappeared. A few decades ago, there were plans for the island for a cargo airport, a power station and dumping of polluted ground. However, in 1990 the Dutch government decided to incorporate Tiengemeten in the Ecological Main Structure (EHS), the network of existing and new nature reserves in the Netherlands. Tiengemeten should become a natural area and the restoration of the tidal movements in the Haringvliet again became an important goal, part of a wider effort to restore the estuary. The restoration of the entire island of Tiengemeten to a natural state is the largest single project in the Haringvliet estuary so far.

b) Objectives

The restoration project focused on the 700 ha. agricultural area of the island. The polders are being turned into a tidal

landscape with creeks, reedlands, brushwood and tidal forests with tourist facilities for the visitors.

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

a) Management

The work was commissioned by the Government Service for Land and Water Management (DLG) of the Dutch Ministry of Agriculture, Nature management and food quality. The island was acquired in 1997 by the Natuurmonumenten Association, a large Dutch nature conservation organisation. The major partners are Rijkswaterstaat (Directorate General for Public Works and Water Management), the municipality of Korendijk and the Province of South Holland.

b) ICZM tools

In October 2007, a large earth-mover created a 50 metre-wide gap in the dyke on the south side of the island of Tiengemeten in the province of South Holland. This undertaking was the last part of a large nature development project for a large part funded by the European Union. The break in the island's defences gave tidal water a free run over a large area of the island. A wilderness is now developing, with areas of reed, brushwood and tidal forest with shallows and mudflats. Before Natuurmonumenten took over the management of the island there were still six tenant farmers working on Tiengemeten. All were offered alternative farms on the mainland. About three-quarters of a million tons of earth have been moved for the re-development, eighty buildings have been demolished and new inlets dug out. Around the three settlement areas, new quays have been constructed to protect them against flooding. The outside dyke has been strengthened, and others have been lowered or removed. Eleven kilometres of road have been removed and replaced by three kilometres of new roads. While 980 poplars have been felled, twice as many trees, mainly ash, have been planted. Natuurmonumenten is using a herd of Scottish Highlanders to graze a large part of the grassland on the island all year round. Although nature development is the priority, there is more to the project.

The landscape has been developed and divided into areas with three distinct characters: wistfulness, wealth and wilderness. With over 600 hectares, the 'Wilderness' (Wildernis) area covers the largest part of the island. Here a natural, tidal landscape has emerged, governed by water and wind. 'Wealth' (Weelde) is the name of the rich, fertile area in the middle of the island. Covering over 300 hectares, part of it is inundated in the winter, drying up slowly in the course of the summer: a haven for waders. It will be a semi-natural landscape with grass, reed and swamp vegetation, mud flats that dry out and shallows. 'Wistfulness' (Weemoed) is the name of the oldest most easterly part of the island, which derives its character from the restoration of the cultural heritage in the landscape and covers 40 hectares. This area, called the Old Polder (Oude Polder), was the first to be enclosed by a dyke, in 1750. Visitors will be able to enjoy fields of herbs and flowers, orchards with old fruit tree varieties, an alder grove and rows of pollarded trees. Smaller dykes that have disappeared are being restored and the small fields will be biologically cultivated by traditional varieties of winter wheat and flax with a plough pulled by the Zeeuwse carthorse. The area includes the grasslands outside the dyke.

The Haringvliet floodgates will be opened up gradually, allowing the tidal range to increase and more exchange of salt and fresh water. When the gates open up even further after 2010, the tidal range will increase to 60 cm and the ratio of salt to freshwater will increase. Tiengemeten will remain a fresh water tidal area, though. The salt sea water itself will not reach the islands' tidal creek, but the tidal range will increase, improving the conditions for Wilderness to develop. For the visitor: There's a visitors' centre in one of the old barns on the waterfront in the harbour and another old farm has been converted into a bed & breakfast with a small 'green' campsite. New footpaths have been laid out, bird hides and observation posts have been built, and soon there will be a special area where children can play. Most of the eight farms along the northern dyke will be restored. A ninth farm and a workers' cottage are right in the middle of the wilderness area, and they will be left to become ruins that will house owls and bats. Some houses on Tiengemeten will remain privately occupied and several houses and farms will also be converted into holiday accommodation. Two museums and premises for Natuurmonumenten are also planned. One of the farms will offer care services where residents, mainly people with mental health problems, can spend time helping with nature conservation activities and working in the heritage fields. In addition to houses and farms, the historical sluices are also being restored.

7. Cost and resources

The purchase and re-development of Tiengemeten is budgeted at €37 m. For the nature development on the island a subsidy

was obtained from the European LIFE fund, and the cultural heritage conservation work has made use of the European Interreg fund.

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

The Haringvliet is a birds directive area. Tiengemeten has always had a rich bird population and numbers are expected to increase further. Already both osprey (*Pandion haliaetus*) and sea eagle (*Haliaeetus albicilla*) have been seen there. In the nature reserve outside the dyke, large numbers of songbirds are already nesting, including the bluethroat (*Luscinia svecica*). As the Haringvliet floodgates are gradually opened, fish such as allis shad, twaite shad, sea lamprey, salmon and sturgeon are expected to benefit. Another species found here worth mentioning is the root vole (*Microtus oeconomus*) a sub-species found only in the Netherlands and a relict from the last ice age. It is the only Dutch mammal that is a priority species in the European Habitats Directive.

9. Success and Fail factors

Existing ecological features were preserved during the re-development of the island. Although the island receives many visitors, most of them walk along the northern dyke or climb an old refuge mound in the middle of the island. Much of the island is impassable for walkers so birds will be able to forage and breed in peace. The nature development was also done with an international twinning partner viz. the Conseil General de la Gironde (FR).

10. Unforeseen outcomes

None so far.

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13. Sources

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