Changing policy to halt the effects of beach erosion and to stimulate tourism - Hel peninsula, PL

1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- SUSTAINABLE ECONOMIC GROWTH: Improving competitiveness

2. Key Approaches

- Ecosystems based approach
- Technical

3. Experiences that can be exchanged

When measures to counteract the effects of erosion are tangibly not working, a change of policy and the use of methods which had never before been employed, can lead to successful results.

4. Overview of the case

Following the building of a harbour at the beginning of the Hel peninsula, hard anti-erosion measures had been used for more than 50 years without effect. Following a complete change of policy, soft measures have been used for nearly 20 years with the result that the effects of the erosion process have been kept in check. The effects have an added stimulus to the tourist industry.

5. Context and Objectives

a) Context

Hel Peninsula is a 36 km long, narrow, low, relatively flat sandy spit situated at the western part of Gdansk Bay in the southern Baltic. The total number of residents, largely the urban communities of Wladyslawowo, Jastarnia and Hel is 23,771 (census of 2000). There are three sectors, and the necessary infrastructure, that are economically important in this area: these are the fishing industry (especially in Wladyslawowo and Hel), the tourist industry (the whole area) and the military services and defence (especially in Hel). The clean water and air, the beaches as well as the seaside dunes landscape has caused an increasing tourist popularity of this region. In this small land area, the population multiplies five-fold during the short summer season. Urbanisation of the spit has been an inevitable consequence of this popularity. Unfortunately, unfavorable building conditions around the existing municipalities has been a major limitations for permanent residential buildings in an expanding development. This has led to buildings being placed in the wider parts of the spit, over the flat ground behind the dunes.

The spit is subject to intense erosion, particularly the first 25 km., where it is very narrow (the maximum width is 300m). This erosion is human induced being caused by the building of a harbour in 1936 which interrupted the longshore transport of sediments. The highest erosion is mainly found in three places:

1. The beginning section of the spit, just after the seawall. Here there are no properties but there is a communication infrastructure: a road and railway that are very important for the spit.
2. After 4 km. Here the spit is at its narrowest being only 200 m. wide. It is also where the greatest erosion is observed. The infrastructure of the road and railway is threatened.
3. At Kuznice, a small town protected by a sand-covered seawall. Practically the whole town is jeopardised by erosion.

b) Objectives

The primary objective of the policy change was to halt the erosion of the peninsula.

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

a) Management

The responsibility for coastal defence falls under the Maritime Office.

b) ICZM tools

Since the construction of the harbour in Wladyslawowo at the beginning of Hel Peninsula the spit has shown progressive erosion. This led to the use of hard structures to remedy the problem. The first protective measures began in 1937 a bulkhead seawall filled with concrete blocks was built. It was 120 meters long and eventually extended by a 130 m. long bulkhead filled with concrete blocks. This, too, was destroyed very quickly and in 1952 it was replaced by a 300 m. concrete seawall. Between 1948 and 1983, a system of groynes was initially constructed at the beginning of the peninsula. However, because they had only a short-term effectivity, preventing erosion for just a few years, more were built. Eventually, over 240 groynes were constructed, most of them 100m-180m long, to the town of Kuznice, a distance of 12 km (an average of one groyne every 50m.). These were reinforced by nearly 3 km. of concrete-filled bulkheads. However, in the longer term, they were still not successful in halting the erosion of the spit. Strong storms and a continuous and increasing lack of underwater sand material meant that the groynes even exacerbated the erosion of the spit.

Therefore, the policy changed and soft measures began to be adopted after 1980. Initially, underwater nourishment – deposition of sand at a depth 3-5m below the water line - was conducted. However, this was only partially effective in strengthening the spit against erosion although encouraging. Therefore, from 1990, beach nourishment was begun. At this time, most sections of the main dune system in the first 10 kilometers of the spit had eroded almost completely. In the first five years to 1994, an artificial dune 4.5m above sea level was constructed. Since that time, the beaches are nourished every two years to compensate for the continued loss of sand caused by the erosion processes. Beach nourishment is now the primary means to protect the spit with re-vegetation to hold the dunes behind the beaches in place. Only in cases where municipalities are in danger of losing properties are hard measures (gabions filled by stones and covered by dune) still undertaken. Many of the post-world war II, wooden groynes have now been destroyed and not replaced. This management option has proven to be additionally beneficial to the tourist industry since it preserves the beaches.

7. Cost and resources

No costs are available.

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

Erosion has not stopped but the beach nourishment process means that it is the artificial beaches and dunes which are eroded rather than the natural dunes behind them. As with any beach nourishment strategy, the sand must be supplied continually in the eroded places. However, this chosen strategy does seem to have achieved its primary objective with the spit, its beaches and communication infrastructure still in place. Not only has there been no negative changes observed in the socio-economic aspects of the area but the beach nourishment process actually has become a tourist attraction at the time that nourishment is conducted. Although the relative costs are higher, the results are better than any other form of protection that has so far been used

9. Success and Fail factors

The most important factor was the change in policy from using hard measures, which exacerbated the erosion problem, to that of using soft measures which holds the effects of the erosion process in check.

10. Unforeseen outcomes

Beach nourishment has itself become an attraction for tourists giving an extra stimulus to the local economy.

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13. Sources

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