Protecting the coast from erosion using hard rock measures - BG

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

2. Key Approaches

- Technical

3. Experiences that can be exchanged

This case shows how hard solutions to protect a coast from constant, severe erosion can be effective in local areas and sea-based activities e.g. tourism enhanced as a result.

4. Overview of the case

Shabla municipality took the conscious decision to compromise part of its coastal landscape in favour of hard rock measures to protect the coast from severe annual erosion. Various structures were built to safeguard the coastline and ensure the livelihoods of the local communities. The measures proved effective to ''hold the line'' and the increased safety has allowed other economic activities to develop e.g. eco-tourism .

5. Context and Objectives

a) Context

The area of Shabla community covers the northern-most Bulgarian coastal municipality. It borders Romania to the north, the Black Sea to the east, Kavarna municipality to the south and General Toshevo municipality to the west. The area of the municipality is 330km2 and constitutes 5.6% of the coastal zone of the country. The population of the municipality is 6,900 in 16 settlements, the chief ones being Durankulak, Krapetz and Ezeretz. The main economic activities are agriculture (85%), industry (5%) and tourism (3%). The negative impacts of erosion are loss of fertile land and crops, loss of tourism sites including accommodation and tourism infrastructure and loss of protected coastal areas and landscape diversity

The Bulgarian land-use plan approved in 1997 is the most effective tool for territorial and coastal management which incorporates the main ICZM principles. The development of the municipality is planned in two directions, agricultural production on one side and expanding coastal tourism and recreation, including spa facilities using the rich ‘medicinal’ muds and hydro-mineral resources, on the other. Coastal erosion is one of the most important problems. Because of its geological character, it is vulnerable and suffers constant, significant losses of fertile land and landscape. The main factors for coastal erosion in the area are chronic sea abrasion 35 to 140 cm/yr., periodic storms (the maximum rate of cliff abrasion is 700 cm/yr. and surface and linear erosion (18cm/yr). Human activities contributing to erosion are negligible, because there is little economic development along the coast.

The main policy option used is hard measures but to create multi-functional uses to accommodate an expanding tourist industry.

b) Objectives

To ‘hold the line’ but, at the same time to create a multi-functional use of the coast and, in particular, to accommodate an expanding tourist industry.

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

a) Management

The Ministry of Regional Development is responsible for overall coastal defence. Implementation of the coastal defence actions is by the local municipality.

b) ICZM tools

For Cape Shabla, a comprehensive, coastal protection, urban plan together with a construction project was ordered by the municipality for the villages including the facilities and a small port (used by both fishermen and recreational yachts) and the necessary infrastructure. To the north of Shabla, this consisted of a rocky embankment protection dyke (200m long), a low jetty (40m long), a high pier (110m long), a concrete wall (105m long) and a berth (125m long). To the south of Shabla, the construction works consisted of a rocky embankment protection dyke (250m long). The fishermen’s village now has berths for 113 boats, 44 yachts and 6 motorised cutters for local tourism trips.

In the case of Krapetz bay, coastal protection and a small port for fishermen, yachts and local tourism purposes entailed the construction of two concrete walls (560m & 258m long), two dykes (693m & 258m long) and two jetties (85m & 31m long).

7. Cost and resources

This National Investment Program for Landslide Coastal Fortification cost €603 million for the five year period 1999-2003 inclusive.

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

The protection measures have been effective and the erosion process has stopped. The main goals have, therefore, been achieved viz. the losses of the shoreline have stopped, the risks to the population and the capital investments have decreased and the interests of the local community have been adequately protected. So far, no negative effects on the coast in neighbouring sections have been observed. Maintenance expenses are very low.

For Krapetz, the existing wall is located directly before the village and the effects are clear - erosion has stopped, the roads and houses near to the shore are safe and a small park has been developed. There is no change in the quality of the beach in front of the wall, and no serious changes in the sea bottom near the beach. Following dyke construction, the shoreline stopped its landward movement, the near shore landslides ceased and there has been no more loss of fertile agricultural land. This is in contrast to the remaining, unprotected part of the bay, where the erosion process is still very active and loss of the fertile land poses a significant threat for the local community.

Socio-economically, the safety of the investments in tourism, fisheries and industry as well as the increased safety of the environmental values and decreased losses in tourism, fisheries and agriculture has increased the standard of living of the local population e.g. the perspectives for eco-tourism have increased in the areas of cultural and historic heritage, rural tourism and diving.

9. Success and Fail factors

There was an initial, international cooperation with Denmark leading to a Danish-Bulgarian ICZM Planning project as early as 1992. This was followed by the Bulgarian ICZM Programme supported by the Bulgarian government in which the Black Sea Environmental Programme also developed an ICZM component. The Shabla municipality was involved in all these programmes and projects and it now has an up-to-date territorial management plan where all future developments and

sectoral strategies are integrated.

There is still a necessity for permanent monitoring of the environment and the effects of the coastal protection measures and facilities although the finances for these activities are lacking.

10. Unforeseen outcomes

The most negative effects are connected with the aesthetics because the concrete walls and the stony dykes are not compatible with the normal natural landscapes in this area. However, a conscious decision was taken to compromise the natural landscapes in favour of the coastal protection facilities.

11. Prepared by

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12. Verified by

It has not been possible to verify this case.

13. Sources

- Shabla-Krapetz (Bulgaria) (2004) I GospodinovaShabla (Bulgaria)
- The Source Provinces in the Black Sea (2003) P Dimitrov, D Solakov, V Peychev & D Dimitrov Institute of Oceanology, Bulgarian Academy of Sciences, Varna, Bulgaria

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Paper by Dimitrov et al (743.66 KB)