

Coastal erosion control through the demolition of a groyne in over-structured beaches, Pafos - CY

1. Policy Objective & Theme

- 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
- SUSTAINABLE USE OF RESOURCES: Sound use of resources and promotion of less resource intensive processes/products

2. Key Approaches

- Integration
- Participation

3. Experiences that can be exchanged

Engineers can work together with stakeholders to develop sustainable and acceptable coastal defence strategies. Integration of problems, active participation, a sound knowledge base and good technical documentation can work against prejudice that “good” coastal structures are only “hard” coastal structures.

4. Overview of the case

The coast in front of the ALMYRA 5 star hotel in Pafos had serious problems with erosion and water quality. It was almost a lagoon, packed with hard coastal structures: within a 200 m length of coastline there were two offshore breakwaters and three groynes. Engineers/Consultants suggested the demolition of the central groyne and construction of wooden piers instead. The results were impressive: on January 2007 the groyne was removed and less than 2 months after the demolition, erosion ceased, a 3 meter wide sandy beach was formed and water quality was improved.

5. Context and Objectives

a) Context

The highly tourist south-west coast of Pafos suffers from severe erosion, mainly due to uncontrolled construction of coastal structures: offshore breakwaters together with groynes, revetments and sea walls which exist along the 10 km coastline. The quality of the coast is a major problem, especially for the characterisation of the hotels as “beach hotels”, i.e. the need to have a beach appropriate for swimming. Several proposals, funded by the Government have been drawn up for improving the entire south-west coast of Pafos but no action has ever been taken. The owners of one 5-star hotel decided to proceed, using their own funds, to commission a study for improving the beach in front of their hotel. The study concluded that the groyne should be demolished. This was initially resisted by the owners as such non-traditional approaches are still unfamiliar. The consultants presented strong evidence and persuaded the owners to fund the works. The works were completed in January 2007. The coast reacted immediately: erosion ceased, accretion started.

b) Objectives

The objectives are to promote sustainable and integrated coastal erosion management schemes in tourist areas, “soft”

structures and environmental friendly solutions, based on a sound knowledge and technical basis and with active stakeholder involvement.

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

a) Management

In Cyprus, the strip of 100 meters from the coastline inland has public use. The District Officer of each District (Ministry of Interior) is the government representative responsible for licensing coastal defence structures. Individuals can pay for studies and construction of coastal works, provided that the studies will be licensed and the public will have free access to the beach.

b) ICZM tools

The south-west coast of Pafos is a complex coastal system, with several drivers and actors co-existing there. The need to intervene at only a sector of this coastline was a challenge. An integrated approach was adopted in order to manage the problem of erosion and beach improvement locally and at the same time incorporate as many parameters as possible from the surrounding area and limit impacts to the nearby coasts. This last task was feasible, since the coast is divided by groynes which create independent, almost autonomous small littoral cells.

A four axis design approach has been adopted:

1. Integration: the system of the entire coastline was analysed:
 - Drivers/ actors,
 - Resources,
 - Ecological issues,
 - Development trends etc
2. Technical design:
 - Function of the remaining structures after the demolition of the groyne
 - Design of demolition
 - Sediment transport dynamics
 - Coastline evolution
 - Monitoring: design of the monitoring scheme after the completion of the works
3. Risk management: risk analysis and prediction of the evolution of the coastline after the demolition of the structures, under the following risks:
 - Extreme wave action,
 - Vulnerability to meteorological tides (surge)
 - Water quality in front of the hotel
4. Stakeholder involvement: a stakeholder strategy was designed and implemented.

7. Cost and resources

Both the study and the works have been funded by the owner of the Hotel (€300,000). Monitoring was an inherent part of the project partly funded, at the beginning, by the hotel owner.

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

This case showed that actual coastal improvement is possible through sustainable and integrated approaches, i.e. the demolition of hard structures can lead to the creation of a beautiful beach. Less than two months after the demolition of the groyne, erosion ceased and accretion started. Three years after, a 3-meter wide beach had been formed. During winter the sandy beach becomes narrower, however after March the sand comes back onto the beach.

9. Success and Fail factors

The active and early involvement (from the very beginning of the project) of the stakeholders was considered as a very important factor for the success of the effort. Monitoring has stopped after the first year due to lack of funding. Continuous funding is important.

10. Unforeseen outcomes

Despite the initial negative reactions, the area now serves as a pilot demonstration area for sustainable erosion control. The results have been presented in conferences and workshops.

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13. Sources

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