

# Reduction of pollution in a coastal lagoon and its impact on adjacent coastal beaches - Barrinha do Esmoriz (PT)

## 1. Policy Objective & Theme

- ADAPTATION TO RISK: Preventing and managing natural hazards and technological (human-made) hazards
- 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
- SUSTAINABLE ECONOMIC GROWTH: Balancing economic, social, cultural development whilst enhancing environment

## 2. Key Approaches

- Integration
- Ecosystems based approach
- Socio-economic
- Technical

## 3. Experiences that can be exchanged

A Natura 2000 coastal lagoon that is under influence of contaminated urban and industrial effluents upstream and discharges to the sea affecting the water quality of coastal beaches was the focus of national, regional and local commitment and co-ordinated establishment of an action plan of interventions. These included the controlled management of the connection between the lagoon and the sea and infrastructures to deviate and treat wastewater effluents.

## 4. Overview of the case

The co-ordination between different levels of governance to address a local but cross-cutting problem that was the source of conflict between Municipalities. Soft-intervention that allows the control of the connection between a small lagoon and the sea as a means to regulate discharges and retention levels.

## 5. Context and Objectives

### a) Context

Barrinha de Esmoriz or Lagoa de Paramos refers to a medium size coastal lagoon in the northwest of Portugal that integrates the Natura 2000 for its high biodiversity and ecological importance. There are two small rivers flowing into the lagoon and it discharges into the Atlantic through a narrow inlet. Geo-politically, the lagoon is situated in the frontier of 2 Municipalities and downstream of a watershed that involves a 3rd one. These urban and industrial centres are the source of heavy pollution of the lagoon for lack of proper treatment of their effluents. This issue represented a source of conflicts between the different municipalities as the frequent flooding and poor water quality greatly impacted the riverside populations and the bathing water quality of adjacent coastal beaches, even leading to the loss of the Blue Flag status in some of them.

Since the 1960's there have been interventions to artificially open and close the lagoon connection with the sea. However these were not co-ordinated actions and every time the lagoon reached its retention limit a new opening would unpredictably occur, destroying all the work done. On the other hand, heavy and permanent interventions were desired to be avoided, not only because they would require extensive studies and assessments beforehand but in the future the structure could become

obsolete.

## b) Objectives

To efficiently reduce the pollution of the lagoon and its impact on surrounding coastal beaches in the short and long term and the flooding episodes that severely affect river-side populations.

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

## a) Project Management

The consortium set up to develop and conduct the action plan integrates all operation services from the Ministry of Environment (GEP, INAG, ICN, IA and IR), the Municipalities of Espinho, Ovar and Vila da Feira, the national and local companies responsible for water supply and waste water treatment (Águas de Portugal and SIMRIA), and the Commissions for Regional Coordination and Development (CCDR) of the North and the Centre of Portugal. The port authority of Douro, the military regiment of Espinho, local councils and 3 NGOs were not official partners but are part of the entities that were active during the process.

## b) ICZM tools

The process to solve this situation had the national political commitment through a legal Ministry Resolution in 2003 which declared the lagoon as a critical area needing urgent intervention and led to the establishment of a Co-ordination and Control Structure (ECC) for the actions to be taken. The ECC, which included all the entities that have competence in the scope of the problem, developed a plan of actions for the short, medium and long term:

- Short term: an experimental project to control the discharge of water from the lagoon to the sea in order to minimise the flood of the riverside and the contamination of the seaside; preference was given to a temporary, soft structure type of solution but that would be capable of resisting the weather and currents while allowing a controlled opening and closing of the connection with the sea. This was achieved by building a dyke of sand for retention of the water of the lagoon and similar to structures built in previous years except for the fact that the inlet was fixed and stabilised by 2 wooden structures with steel cables, which is easily removable. Between these, a 30m sand dyke was defined which corresponded to the area that could be closed during the bathing season, to avoid contamination of the shore, or open when the level of water retention of the lagoon was reached, allowing it to discharge. In this case, the opening of the dyke was planned taking into account the winds, tides and waves but also public occupation of the beach. This would usually be done at the end of the day and, as a precaution, the adjacent beaches would be closed to the public during the following few days until normal conditions again prevailed. This whole process is conducted with the participation of all the entities involved and accompanied by public dissemination of the action that will take place.
- Medium term: through SIMRIA the implementation of the actions to reduce the sources of pollution upstream which discharge in the lagoon, a process which had already begun before the establishment of the ECC. These included the enhancement and enlargement of the water treatment station (ETAR) of Espinho and infrastructures that would transport urban and industrial untreated effluents to this ETAR. The treated waters would then be discharged into the sea through a submarine pipe.
- Initial actions to decontaminate the lagoon bed itself included initiating the process to conduct an Environmental Impact Assessment required before any further interventions.

This process was accompanied by actions of awareness targeting the local populations and in particular school age youngsters.

# 7. Cost and resources

€340,000 attributed to the plan to restore the Lagoon. Enlargement of ETAR of Espinho: €10M. Total investment for the infrastructures: €23 M.

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

The work made in the inlet had two immediate objectives that were clearly achieved and are associated with the controlled regulation of the connection between the lagoon and the sea. Firstly, it allowed a reduction of the impact of contaminated discharges in adjacent coastal beaches and secondly, a better management of the flooding episodes by the control of the level of retention of the lagoon. Some of the coastal beaches were awarded the blue-flag again in the year that followed the conclusion of this work. The water quality of some of the in-flowing rivers (mainly in the south) was significantly improved as a significant part of the urban and industrial effluents have been deviated to proper treatment facilities.

## 9. Success and Fail factors

This case is considered to be an important reference of good practice that has established clear objectives and priorities agreed with the several partners involved. These results reflect the need of a strong commitment at the national, regional and local levels. The decisions regarding the temporary technical solution for controlling the connection lagoon-sea were highly affected by the past experiences and occurrences associated with this area.

## 10. Unforeseen outcomes

None, so far.

## 11. Prepared by

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## 13. Sources

- Projecto-Piloto da Barrinha de Esmoriz: um exemplo a nível nacional de Gestão Integrada das Zonas Costeiras (GIZC). A. Mota Lopes. CCDR-Centro.



Projecto Piloto da Barrinha de Esmoriz (25.17 MB)

