

EUROPEAN LIFE PROJECT:  
A GLOBAL STRATEGY FOR THE RESPONSIBLE USE OF A  
COASTAL LAGOON

A CASE STUDY FROM PORTUGAL

INTEGRATED MANAGEMENT STRUCTURE OF RIA DE AVEIRO:  
ESGIRA – MARIA

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## ABSTRACT

*Ria de Aveiro* is a coastal lagoon located at the Central Region of Portugal subjected to the influence of the tides, resulting in a set of characteristic biotopes favouring anthropic and natural processes. Once managed and controlled correctly, each of these biotopes will allow simultaneously the biodiversity and integration in the making of the wetland landscape.

In 1998, one of the final conclusions of the “MARIA” Demonstration Programme for the Integrated Management of *Ria de Aveiro* was that the poor current state of the environment area resulted from a set of interrelated factors. The Programme selected four (4) pilot-projects towards the integrated management of the lagoon biotopes as possible scenarios for an intervention. This selection was based in criteria related to environmental priorities and the maintenance of traditional economic activities in the region.

The idea of choosing projects that would involve the whole geographic space of the *Ria*, without forgetting the other important themes interrelated with the Management Structure, emerged as a relevant aspect for their definition.

Thus, and as a first test of this Management Structure functionality, the following task forces were put forward:

- Recovery and valorisation of the piers;
- Recovery of the former salt pans;
- Management of the agricultural fields of *Baixo-Vouga*;
- Implementation of measures for the classification of the Protected Landscape Area of the River *Cáster* Mouth.

This paper will report the main results of these pilot-projects attained during their first year period, especially the intervention strategies defined by the Partnership created for this aim.

## INTRODUCTION

Regarding the Territorial Planing of Coastal Zones, the European Commission identified an insufficient co-ordination and concertation. The lack of legislation and the set of instruments available are far from being fully efficient mainly due to the non-existent co-ordination between the different participants in the coastal zones evolution and transformation. This situation, identified by the Commission for the European space, unfortunately adjusts to the Portuguese reality.

The proposed aims were meant to fulfil the detected insufficiencies, namely, the non-articulation of activities between the different levels of administration, inadequate instruments and legislation, and the non co-ordination between the different users of the coastal zone. A negotiation between the different groups integrated in the partnership of the *MARIA* project (LIFE96 – ICZM Demonstration Programmes) was held so that it was possible to test the efficiency of an integrated management structure.

In 1997 and 1998, the Department of Environment and Planning from the University of Aveiro has established a partnership along with the local, regional and central administration and with local associations in the context of the *MARIA* project – Integrated Management Programme for the “Ria de Aveiro”<sup>1</sup>. This project is a demonstration programme on integrated coastal zones management financed by LIFE 96. Its main objective was to find a coastal zone management which would allow an integrated development, participation and concertation (MARIA 1998) not only in the “Ria de Aveiro” area but also in other areas with similar characteristics.

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<sup>1</sup> In the context of this project, the designation of “Ria de Aveiro” not only refers to the wetland but also includes all the municipalities in its surroundings as well as all those who, due to natural conditions, are associated with the Ria.

“Ria de Aveiro” is a coastal lagoon that, due to its exposure to the tidal regime, possesses a complex and characteristic biota propitious to the simultaneous course of natural and anthropic processes. Both processes, when fairly managed and controlled, can guarantee the biodiversity and the integration of Men in this Wetland landscape. The large social, economic and patrimonial diversity as well as the features of the existent juridical and institutional structures are reproducible in an also large diversity of interest groups. Aside from the entities with legal capacity to intervene in the lagoon area and the coastal zone, there are also a great number of entities directly or indirectly interested in the lagoon, where they develop their activities or influence its quality and have different intensities of action. (MARIA, 1996).

After the identification of the problem, the *MARIA* project partners <sup>2</sup> met to define an Integrated Management Structure for the “Ria de Aveiro”, considering that this structure needs to be tested in what concerns its ability to manage the multiplicity of determining vectors in the present environmental condition of this wetland.

Among the possible scenarios of intervention, this partnership selected a group of four pilot-projects:

- Recovery and optimisation of the existent quays in the “Ria” channels;
- Recovery of salt-pans for the production of salt – “Salgado de Aveiro”;
- Management of the agricultural fields of the *Baixo-Vouga* area, so that the agricultural activities and the natural habitats could coexist;
- Setting actions to promote classification and integrated management of the *Foz do Cáster* Landscape Protected Area.

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<sup>2</sup> (DGXI, DAO/UA–DEPARTAMENTO DE AMBIENTE E ORDENAMENTO, ICN–INSTITUTO DE CONSERVAÇÃO DA NATUREZA, IHERA–INSTITUTO DE HIDRÁULICA, ENGENHARIA RURAL E AMBIENTE, DRAC–DIRECÇÃO REGIONAL DO AMBIENTE CENTRO (MINISTÉRIO DO AMBIENTE), CCRC–COMISSÃO DE COORDENAÇÃO DA REGIÃO CENTRO, AMRIA–ASSOCIAÇÃO DE MUNICÍPIOS DA RIA, AIDA–ASSOCIAÇÃO INDUSTRIAL DO DISTRITO DE AVEIRO, JAPA–JUNTA AUTÓNOMA DO PORTO DE AVEIRO, the municipalities of DE ÁGUEDA, ALBERGARIA-A-VELHA, AVEIRO, ESTARREJA, ÍLHAVO, MIRA, MURTOSA OLIVEIRA DO BAIRRO, OVAR E VAGOS)

These projects emerged from meetings of the Demonstration Programme held last year. Their selection was based in criteria related to environmental priorities and maintenance of traditional economic activities in the region. Besides, other determinant factors prevailed on the selection of those pilot-projects: on one hand, the interest shown by the various partners for the prosecution of these projects integrating or articulating them in other projects of their agenda; on the other hand, for the intervening entities or the scientific community and for the different levels of decision-makers to use the acquired knowledge on the subjects in study.

## **MATERIAL AND METHODS**

The methodology used to test this structure was based in pilot-projects identified in the course of the MARIA project. These pilot-projects emerged from the need to develop wholesome projects that would integrate all the wetland geographic area (without neglecting the importance of other relevant themes related to the management of the *Ria de Aveiro*). This area thus profits from being an object of investigation and was considered a good example of typing the problems of management usually risen in this kind of structure places.

A work programme was developed aiming to respond to the specific needs of each case:

### **A – Recovery and Optimisation of the Quays**

The canals were used to transport people, cattle and merchandise, when there were no other highways along the *Ria* and obviously implicated the existence of numerous quays in the coastal villages. Only 37 of the 107 quays are still in use. Most of the quays are degraded due to the lack of use, some of them disappeared and others are too derelict or proving almost impossible to recover.

Bearing in mind the historical and cultural meaning of these quays and how crucial they are for revitalising the *Ria*, it is important to develop a plan to recover and revitalise one key quay. In an integrated management perspective, it should present enough potential and interest to the welfare of the population.

This pilot-project will try to find solutions that could stimulate the waterfront communities towards an increased involvement on the future revitalisation of the *Ria*, which by itself would encourage leisure and recreational components. In this sense, the following procedures are necessary:

- To define the physical, social and environmental qualification the quays
- To define strategies for the physical recovery and qualification of the quays.
- To implement revitalising strategies.
- To typify the quays adjustment to potential uses of the waterfront margins.

The methodological approach involves seven different phases

- 1<sup>st</sup> Phase: the knowledge of the dynamic of the *Ria* as a way to define the guidelines to intervention actions;
- 2<sup>nd</sup> Phase: the study and diagnosis of the *Ria* (potential/problems/vocations), its navigability, the interest of navigation activities and municipality intervention;
- 3<sup>rd</sup> Phase: drawing up theoretical models to revitalise the quays;
- 4<sup>th</sup> Phase: the evaluation of the various quays and selection of those which will be object of intervention by a multi-criteria analysis;
- 5<sup>th</sup> Phase: to apply the revitalising model to the target quays;
- 6<sup>th</sup> Phase: the conclusions and recommendations concerning the theory and practice developed;
- 7<sup>th</sup> Phase: to use the most appropriate revitalising models to the whole of the quays.

## **B – Recovery of Aveiro’s Salt-pans**

The salt collecting activity in the *Ria de Aveiro* belongs to an old traditional activity fundamental to the regional economy although it is decaying nowadays. The salt-pans occupy almost 1500 ha but a large number of marines were abandoned and others were replaced by aquaculture tanks, as a consequence of the crisis affecting the sector, due to its low rentability. Moreover, the strong water currents of high tides inside the lagoon destroys the defence walls (“motas”) of the marines and excavates their bottoms, which also contributes for its degradation and abandon. The aquaculture activity has been restricted in order to control water pollution, thus inhibiting its growth and, consequently, it not offering a good economic alternative to the gathering of salt. As far as ecological equilibrium and conservationist values are concerned, the abandon of the salt picking-up activity has affected negatively population, limicola and migratory birds. European Community Directives protect most of these migratory birds, as this area is a nesting and feeding site.

The main objective of this pilot-project is to create a programme to ensure the future occupancy of the salt pans by allowing not only economic activities to be developed in this wetland but also that its natural and landscape values are respected. To attain this, it is necessary to:

- Study the salt-pans (active or abandoned) for collection of elements in order to improve both the salt collecting activity and the environmental characteristics of aquaculture, promote the eco-tourism, acknowledge interaction between the avifauna components and the system productivity;
- Recover the salt pans through compatibility of salt-gathering activity and environmental preservation; the recovery of an area which is also an Euro-Mediterranean cultural legacy; achieve an integrated management for the different uses; introduce new leisure activities (Eco-tourism).
- Promote a concerted strategy among the many qualified entities that nowadays are engaged on isolated activities to profit from the means and favour the fulfilment of the objectives.

This pilot-project is divided in three different phases:

- 1<sup>st</sup> PHASE: to establish an updated framework, by assembling all the possible information related to occupancy/abandon of salt-pan areas, landowners of the area, current and foreseen intervention actions, legal regulations, knowledge of ecological conditions of salt-pans, negative effects of contamination in the quality of environment;
- 2<sup>nd</sup> PHASE: to complement shortage of the previous phase with the help of the field work regarding, for example, the socio-economic characterisation of producers and landowners, social, economic and structural characterisation of the groups and the building-up of testing samples.
- 3<sup>rd</sup> PHASE: to process the information analysis to ensure the formulation of working purposes for the studied area and the identification of financial programmes to support them.

## **C – Integrated Management of *Baixo-Vouga* Agricultural Fields**

The land-cover of the *Baixo Vouga* lagoon reaches almost 47.000 ha with heavy structured halomorphic soils, the salt-pans, constantly subjected to tide regime. The land-cover of the *Baixo Vouga* agricultural fields amount to almost 3.000 ha, with non-salt or poor salinity level soils of alluvial nature and medium or light texture. Dams protect them from tide action, but they can be temporarily flooded in Autumn/Winter with specific hydrological conditions (high tides, strong coastal winds and river overflowing). The existence of several biotopes on the region such as the reed-plots and the rush-plots make it a very high primary productivity area essential to the identity of the lagoon ecosystem. This zone has the needed features to be included in the list of wetlands with international importance (RAMSAR Convention). Also under the EU directives (Bird and Habitats Directives), this area can be transformed in an “ecological paradise” if the required environmental non-aggressive socio-economical conditions could be implemented. The structural and diversifying biotopes should be preserved by controlling invasion of salted-areas and maintaining the variety of crops and crops operations in *Baixo-Vouga* in order to ensure diverse resources to the aquatic and birds of prey and the “passeriformes” all along the year. It should be borne in mind that all the economic actors, including the public departments, private enterprises, NGO’s, consumers and mainly the inhabitants must share ecological responsibilities. The resident population is still a full or part-time farming one.

The aim of this pilot-project is to create a management programme for this Wetland within the specific integrated management structure. This structure must be able to articulate and making the agricultural activities compatible with the maintenance of the existing ecosystems: saltmarshes and reed-plots, old rice fields and pastures, "bocage", pasture x cornfields. To achieve this objective it would be necessary to:

- Create a GIS (Geographical Information System) to perform soils, drainage and salinity mapping, natural biological resources, hydro resources, agriculture systems, list of fito-sociology spontaneous vegetation, composition of tree-shrub levels (location, density, orientation), property register, identification of landowners and possibilities of field exploitation;
- Acknowledge the interaction between biotopes components and productive systems;
- Adopt measures in order to preserve and defend the agricultural soils, the spontaneous vegetation and the transition between the salted area and the agriculture area. The management of water resources, the maintenance of agricultural traditional systems, the improvement of friendly environmental agricultural practices, the valorisation of “marinho” autochthonous race and sports horse race. The protection and recuperation of habitats (natural pastures and shrubs, rice-fields, reed-plots and salt-marshes) essential to birds, mammals and amphibious, and of species. The maintenance and recovery of natural fences, the promotion of “ecological tourism”, the control of hunting practices, the definition of areas to be protected under Bird and Habitats Directives in the National System for Protected Areas;
- Promote a concerted strategy of the different agricultural measures and instruments and of the environmental policies in order to ensure that the objectives are achieved;
- Find agricultural and environmental financial programmes allowing to cover the costs of a sustainable use of the area by farmers;

This project is divided into six phases:

- 1<sup>st</sup> PHASE: to obtain all the information that enables an updated picture to be established concerning the objectives described in the previous point;
- 2<sup>nd</sup> PHASE: the fieldwork enabling to complement eventual insufficiencies of the previous phase;
- 3<sup>rd</sup> PHASE: the processing of the data to be analysed enabling the formulation of working purposes to the area in study and the identification of financial programmes to support them;
- 4<sup>th</sup> PHASE: to design non aggressive agriculture and cattle raising strategies for the ecosystem to optimise the agricultural field of the *Baixo Vouga* by presenting recommendations for the integrated management of fauna and flora resources;
- 5<sup>th</sup> PHASE: the definition of conservation strategies for the natural habitats and the definition of protected areas.

**D – Classification and Management of the *Foz do Cáster* Landscape Protection Area (*zona de paisagem protegida*)**

*Cáster* is one of the rivers of the *Ria de Aveiro* basin. It is located in the south limits of *Ovar* Municipality (north limits of the *Murtosa* and *Estarreja* municipalities) being one of the most important wetlands in the area of the *Ria*. Although occupied and explored by man to agricultural activities, this zone still presents important areas of reed plot and humid grassland, mainly due to its extreme productivity, and high ornithological value as its forest areas protect fields and fauna. This region possesses a great diversity of bird species and nesting sites, some of them object of severe recommended preservation, namely the *Circus aeruginosus*, the *Ixobrychus minutus*, and the *Ardea purpurea*.

The general objective of this pilot-project is to achieve a Protected Landscape Area classification through:

- Protective measures for the native fauna and flora of the *Ria de Aveiro*;
- Recovery of migratory species habitats, namely the reed plot;
- To safeguard the necessary conditions for the red - heron and the toad- eagle nesting;
- Enhancement of the landscape;
- To promote the region development by taking full advantage of the natural and human components' interaction of the populations of *Marinha*, *Ribeira*, *Puchadouro*, *Moita*, *Tijosa* and *Torrão do Lameiro*;
- To develop an area for environmental education and scientific investigation.

This project has four different phases:

- 1<sup>st</sup> PHASE: to acknowledge the data and the technical work developed in the area;
- 2<sup>nd</sup> PHASE: to define the Protected Landscape Area;
- 3<sup>rd</sup> PHASE: to develop the necessary actions to implement the proposal;
- 4<sup>th</sup> PHASE: to supervise the preparatory actions to install and manage the Protected Landscape Area.

## **DISCUSSION OF THE EXPECTED RESULTS**

The aim of this project is to misguide the virtues and insufficiencies of an integrated management to the “Ria de Aveiro”. One of the intentions of the project is to identify an integrated management for the coastal zone methodologies and in particular for the wetlands. On the basis of a negative scenario, it will be possible to identify mechanisms allowing the reformulation of a particular structure containing all the diverse and multiple aspects related to physical planning and conservation of this area.

The innovating character of this integrated approach of physical planning and management (considered necessary for promoting the coastal zones sustainable development) presents a series of difficulties and risks due to the non-existence of a consistent theoretical reference supporting the implementation of projects with these features. The inherent difficulties and risks to this project increase when the social, institutional and politic context in which the project is developed is considered, due to the agents weak tradition of planning, participation and concertation in Portugal and the low involvement level in partnership (legally conditioned by the political calendars). Meanwhile the acquired experience by the actual partnership during the MARIA project (LIFE’96) enriches the actual project. This is very important due to the number and diversity of entities, composing the actual partnership. These entities are representative of the different legal levels and capabilities to intervene in the *Ria* area, thus also presenting different perspectives of use and specific dynamics. The importance of this partnership is therefore huge, as every participant is willing to co-operate in order to achieve the sustainable development of this region.

The integrated management of coastal zones is in the agenda of the EU and this project will contribute to develop strategies at this level, as it presents an operative aspect to test the capacity of one management structure in the resolution of the problems that affect the coastal wetlands.

## REFERENCES

- ALVES F, BOGATAJ M, BUCHHOLZ H, FERREIRA J C, HERAS SEVILLA A, JOORDENS C A, IANNARELLI E D, PENNING-ROUSELL E P, RUDOLPH K U & VALLEGA A 1997 Workshop Report on Coastal Urbanisation. *In: Transdisciplinary Euroconference on Coastal Management Research*. European Science Foundation. Barcelona, p 69-75
- ALVES F, PINTO L, FERREIRA I, MARTINS F & COELHO C 1997 A Integrated Management Programme for Ria de Aveiro – a Portuguese case study. *In: Proceedings of the 6<sup>th</sup> EUCC International Conference – Coastlines'97, "Connecting European and Mediterranean Coasts"*. CD-Rom.
- ANDRESEN T, MARTINS F, ALVES F & PINTO L 1996 Biophysical Planning in the Northern Coastal Area of Portugal: Case-Study: POOC Norte Caminha – Espinho. *In: Partnership in Coastal Zone Management*, Edited by Jane Taussik & Julian Mitchell. U.K., Samara Publishing Limited, Cardigan, p 207-212.
- CCE 1996 Towards Sustainability - Progress Report From The Commission on The Implementation of The European Community Programme of Policy and Action in Relation to The environment and Sustainable Development". COM (95) 624 final. Brussels
- CE 1996 Ensuring a Common Understanding of ICZM - Concepts Within The Teams of The European Demonstration Programme on Integrated Management of Coastal Zones. CZ DEMO 96-3; Brussels, p16
- CE 1996 Programa de Demonstração Sobre a Gestão Integrada das Zonas Costeiras; Documento de Informação dos Serviços da Comissão Europeia – DG Ambiente, Segurança Nuclear e Protecção Civil; DG Pescas, DG Políticas Regionais e Coesão, XI/79/96, p 49
- DAO/UA 1996 Programa de Gestão Integrada para a Ria de Aveiro- *MARIA*, proposta ao programa LIFE96, Maio, documento policopiado.
- DIAS H. 1993 Projecto de Desenvolvimento Agrícola do Vouga - Projecto de Drenagem da Rede Secundária da Unidade V. IEADR, Lisboa.
- EC 1997 Better Management of Coastal Resources: a European programme for integrated coastal zone management. Brussels, p 47
- EC 1998 Demonstration Programme on Integrated Coastal Zone Management Meetings of the Project leaders and National Experts. 10-11/6/98, Lisbon, Doc.ICZM/98/03. DGXI, Brussels.
- GOMES F & ALVES F 1997 A Critical View About The Coastal Zone Management Plans in Portugal, *In: Proceedings of International Conference "Environmental Challenges in a Expanding Urban World and The Role of Emerging Information Technologies*. Edited by J. Reis Machado & Jack Ahern. CNIG. Lisboa, p 515.
- IHERA 1997 Princípios e Orientações das Intervenções do MADRP nos Campos do Baixo Vouga Lagunar (preliminary version). Lisboa.
- JEMMETT A. 1998 Implementing Estuary Management Plans – a Case Study from the Dee Estuary". *In: Geographical Journal*, vol. 164, n.º 3: 307-318.

LOICZ 1995 Coastal Zone Resources Assessment Guidelines. *In*: LOICZ Reports & Studies nº 4. Lead Authors: R K Turner and W N Adger. Manila, Philippines. p 101.

MARTINS F & COELHO C 1997 A Componente de Parceria na Gestão Integrada da Zona Costeira – reflexões teóricas sobre o tema no contexto comunitário. *In*: Proceedings of Seminário sobre a Zona Costeira do Algarve (Discussão Multidisciplinar dos Problemas Existentes). EUROCOAST, Faro, p 89-95.

MARTINS F M 1997 Políticas de Planeamento, Ordenamento e Gestão Costeira – contributo para uma discussão metodológica”, PhD Thesis, Departamento de Ambiente e Ordenamento da Universidade de Aveiro. Aveiro, p 270 (unpublished thesis)

MARTINS F, ALVES F, SEIXAS A & VELOSO-GOMES F 1997 Evaluation of Coastal Zone Management Plans in Portugal. *In*: Proceedings of Coastal Zone 97 The Next 25 Years – Charting the Future of Coastal Zone Management. Edited by Martin Miller and Jessica Cogan. Boston, Massachusetts, Vol. I: 78-80

MARTINS F, PINTO L; ALVES, F, FERREIRA I & COELHO C 1998 The Application of Integrated Coastal Zone Management Concepts to a Portuguese Case-Study. *In*: Proceedings of International Conference about Coastal Zone, 98, Victoria BC, Canadá. 25-26

STALLARD J 1998 Land use dispute within the Baixo- Vouga Laguna, Ria de Aveiro – Portugal. Unpublished Master Thesis. Universidade de Aveiro.

TAUSSIK J & GUBBAY S 1996 Networking in Integrated Coastal Zone Management. *In*: Partnership in Coastal Zone Management. Edited by Jane Tussaik & Julian Mitchell; U.K., Samara Publishing Limited. Cardigan, p 57-63

UNIVERSIDADE DE AVEIRO 1989 Estudo de Impacte Ambiental e Sócio-Económico do Projecto de Desenvolvimento Agrícola do Baixo Vouga Lagunar. Departamento de Ambiente e Ordenamento da Universidade de Aveiro, Aveiro.