

The practice of coastal zone management in Portugal

Taveira Pinto, Francisco

*Faculty of Engineering, University of Porto, Rua do Dr. Roberto Frias, 4200 - 465 Porto, Portugal;
Fax + 351225081952; E-mail fpinto@fe.up.pt*

Abstract. The practice of coastal zone management in Portugal is very recent. Key issues and considerations about natural shoreline dynamics, main policy instruments, and lessons learned from the EU Demonstration Programmes on Integrated Coastal Zone Management in Portugal will be outlined in this paper in an attempt to understand how the practice of ICZM and its prospects are. Coastal zone management problems and their associated side effects, as well as national and international evolution patterns will be drawn. Some means of achieving better coastal zone management practices and ways of addressing some of its forefront issues are also identified. Special attention will go to erosion problems. The pressure induced by urban development and economic activities on coastal areas is increasing. Poor sediment availability combined with years of neglected management and over-exploitation of resources have had a negative impact, and there are many areas showing evidence of coastal erosion. There is a need to improve policies and instruments of coastal planning and management. Coastal zone management plans are being developed for the nine sectors of the continental Portuguese coast, providing a full analysis of coastal systems and a delimitation of uses in relation to the carrying capacity of the shoreline.

Keywords: Coastal policies; Coastal zone management plans; EU Demonstration Programmes; Erosion; ICZM.

Abbreviations: ANAS = Hispano - Luso Association of Municipalities; APP = Área de Paisagem Protegida (Protected Landscape Area); DL = Decreto Lei (Decree-Law); ICN = Instituto de Conservação da Natureza (Institute of Nature Conservation); ICZM = Integrated Coastal Zone Management; RCM = Resolução de Conselho de Ministros (Resolution of the Council of Ministeries); SPZ = Special protection zone.

Introduction

The Portuguese coast along the Atlantic Ocean extends over 800 km, following a general orientation north-south along the west coast and west-east along the south coast in the Algarve. Sandy beaches, dune ridges, lagoons, estuaries and cliffs, constitute the most commonly found habitats along this coast, which in turn shelter important coastal ecosystems from the ecological and biophysical points of view. Beside nature, the Portuguese shoreline also hosts a large number of cultural heritage sites, as well as urban seafronts.

The pressure induced by urban development and economic activities on coastal areas is increasing. Poor sediment availability combined with years of neglected management and over-exploitation of resources have had a negative impact, and there are many areas showing evidence of coastal erosion. To overcome these problems, efforts should be made to improve policies and instruments of coastal planning and management in the relevant areas. Today, the most important of those instruments in Portugal is the set of coastal zone management plans, of which eight out of nine have already been approved and published for continental Portugal. These plans provide a full analysis of coastal systems and a delimitation of uses in relation to the carrying capacity of the shoreline.

Generally speaking, coastal zone management plans provide the basis for spatial and land use planning of coastal zones, for beach management, for sustainable tourism development, for the regulation of coastal waters, and for nature conservation. These plans represent regional management approaches to enhance quality and sustainable use of coastal resources. Rural and urban coastal environments are tackled here within the same level of importance, and therefore coastal landscapes are considered with a structural focus.

The analysis of Portuguese coastal zone management plans is preceded by a brief description of the Portuguese planning system and main policy instruments at different levels, as well as of the current state of implementation of the 'Natura 2000' network in Portugal.

Coastal hydrodynamics is another aspect which strongly influences coastal environments and thus the analysis and the guidelines included in coastal zone management plans. A combination of factors – both natural and human induced – operating on different temporal and spatial scales is responsible for transforming coastal landscapes. Consequently, it is crucial to understand causes and effects of all relevant physical and human induced processes before advancing with any forecast on shoreline evolution trends. In Portugal, the former aspect, relating to human induced processes, has been widely neglected in coastal practice since decades. Development proceeded in a haphazard and unplanned way. As a result, many coastal areas have suffered many impacts with important ecological, societal and economical negative consequences.

These, as well as other relevant aspects relating to the practice of coastal zone management in Portugal are reported in this paper. Finally, it introduces a set of guidelines linked to integrated coastal zone management which are meant to improve that practice in the future.

Policy instruments for coastal zone management

Generally speaking, territorial management is the supervision of territorial planning procedures. This should be an integrated process by which soil occupation, use and transformation are put together considering its carrying capacity. The Portuguese planning system is divided into three main levels of decision-making: national, regional and municipal. In the Portuguese Decree-Law no. 380/99, from 22 September 1999, the planning process is conceived as a sequence of procedures, in which the different plans at each level of decision-making, having different approaches, principles and goals, depend and look out to the highest plans in the hierarchy. However, there are some exceptions to this hierarchy scheme. The existing policies and hierarchy between them (Table 1), is as follows:

National Plan Programme for Territorial Management Partial Plans and Special Plans

- Decree-Law No. 151/95, from 24th June 1995;
- Decree-Law No. 5/96, from 29th February 1996;

Management Plans of the Natural Protected Areas, Management Plans of the Public Water River Catchments and Coastal Zone Management Plans

- Decree-Law No. 309/93, from 2nd September 1993;
- Decree-Law No. 218/94, from 20th August 1994;
- Decree-Law No. 151/95, from 24th June 1995;
- Decree-Law No. 5/96, from 29th February 1996;
- Regulation No. 767/96, from 30th December 1996;
- Decree-Law No. 380/99, from 22nd September 1999.

Regional Plans of Territorial Planning

- Decree-Law No. 176-A/88, from 18th May 1988;
- Decree-Law No. No. 367/90, from 26th September 1990;
- Decree-Law No. No. 380/99, from 22nd September 1999.

Municipal and Inter-Municipal Plans for Territorial Planning (e.g. municipal master plans, Urban Plans and Detailed Plans)

- Decree-Law No. 69/90, from 2nd March 1990;
- Decree-Law No. 211/92 from 8th October 1992;
- Decree-Law No. 380/99, from 22nd September 1999.

Special Plans are defined by the central administration, establishing the desirable relationship levels between uses and population. These levels are defined following nature and biodiversity conservation goals and taking into account the implications and influence of other municipal plans.

Another important planning tool is the Hydric Domain (DL No. 468/71 of 5 November 1971), which defines a public protection strip that reaches inland as far

Table 1. The different planning tools objectives.

Regional plans	Municipal plans	Coastal Zone Management Plans
<ul style="list-style-type: none"> • Implements at a regional level, the options and guidelines of the National Management Territory Programme, and the Sector Plans; • Translate, in spatial terms, the main objectives of economic and social sustainable development of the Regional Development Plan, minimizing ecological loading; • Take measures that can lead to the reduction of intra regional development inequalities; • Regulates territorial development. Under this plan, other special and municipal plans have to be implemented; • Defines a model for regional territory organization. 	<ul style="list-style-type: none"> • Regulatory planning tool, approved by the municipalities; • Establishes the land use management by zoning, propose models of human occupation, urban and transport organization, physical infrastructures location and parameters of land use and environmental quality; • Establishes the (charge) capacity of the territory; • Support the social and economic development policy. 	<ul style="list-style-type: none"> • Regulatory planning tool, elaborated by the Government • Establishes different uses and specific activities to be developed along the coast; • Classifies beaches and regulates bathing use; • Coordinates coastal development and resource conservation, ensuring public access to the coast; • Regulates nature conservation and shore protection.

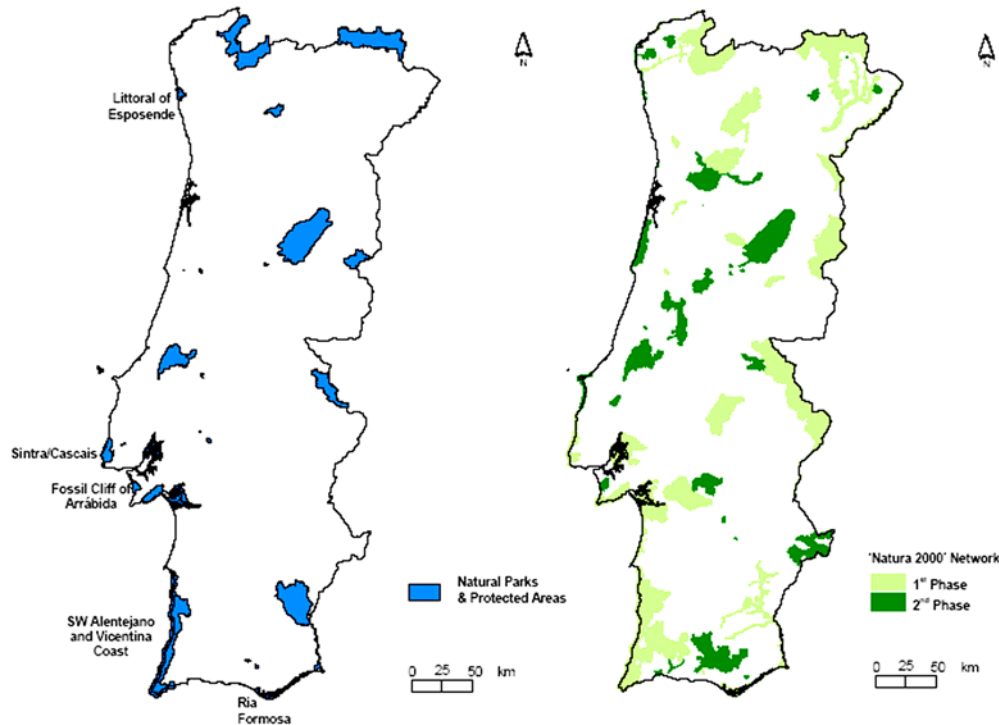


Fig. 1. Natural Parks, Protected Areas and 'Natura 2000' Network in Portugal.

as 50 m and seaward reaches 30 m depth, measured at high water. From the outer extent of the inland boundary is another protection strip, of 500 m wide which corresponds to the coastal zone management plans intervention areas. These can be either public or private. Within these same areas is the National Ecological Reserve (DL No. 93/90 of 19 March 1990 and DL No. 213/92 of 12 October 1992).

Within the coastal zone management plans, which include natural areas and/or parks (Fig. 1), the jurisdiction and supervision passes to the Institute of Nature Conservation, responsible for the protected areas and natural parks in Portugal.

The Protected Areas Management Plans define the strategies for nature protection and conservation in development, namely land use management patterns according to the existing natural heritage. The implementation of these plans is now in place through a set of regulations/enforcements, which geographically define patterns and limitations of land use.

In addition to the former instruments of planning are the ones provided by the implementation of the 'Natura 2000' network. Currently, the 'Natura 2000' network is in the stage of implementation, both in continental Portugal and in the islands. The institution responsible for its co-ordination, for the whole Portuguese territory, is the Institute of Nature Conservation.

The current state of implementation of the network in Portugal is (<http://www.natura2000benefits.org>):

(1) Continental Portugal

- DL No. 384-B/99 from 23 September 1999 approves the list of special protection zones (SPZs);
- a sectoral plan is being elaborated;
- up to the existence of accurate instruments for territorial management and for environmental impact assessment, all the activities within the areas of the network have to be submitted to the Institute of Nature Conservation;
- there is already a management plan for the SPZ of the Tejo estuary (Regulation No. 670A/99 from 30 June 1999) regulated and the others are in elaboration;
- the Institute of Nature Conservation is co-responsible for the biodiversity planning of the SPZs.

(2) Azores

- Regional Legislative Decree No. 18/2002/A from 16 May 2002, which adapts the DL No. 140/99 from 24 April 1999;
- up to the existence of accurate instruments for territorial management and for environmental impact assessment, all the activities within the areas of the network have to be submitted to the Regional Directorate of Environment;
- review, cartographic delimitation and characterization of the SPZs completed;
- LIFE 'Sea Birds' and LIFE 'Tides' for the restoration of some habitats;
- Dissemination and signalization of the regional SPZs network.

(3) Madeira

The SPZs are all included in areas classified as protected areas, and are therefore under the nature protection guidelines established for the Natural Park of Madeira.

The challenges posed to the implementation of the 'Natura 2000' network depend on the efficiency of the application of the guidelines for management and of the compromise to assume the network as a national responsibility. Main priorities identified in this field are the following:

- elaborate and implement efficient management plans for each SPZ;
- broader implementation of the network at the national level;
- enhance stakeholder participation on the network process of decision-making;
- review of the DL No. 140/99 from 24 April 1999– this DL transposes the Birds and Habitats Directives to Portuguese law;
- implement the EU strategic action plans on biodiversity, the national action plan for birds at risk, and also the national strategy for nature and biodiversity conservation;
- elaborate a manual of good practices for the sectors of economy affecting birds and habitats;
- classify all important bird areas (IBAs), as it was made for the SPZs.

Management plans for the Portuguese coastal zone

Continental Portugal was divided into nine coastal stretches, each corresponding to one coastal zone management plan (Fig. 2). From north to south these nine plans are: Caminha - Espinho, Ovar - Marinha Grande, Alcobaça - Mafra, Cidadela - S. Julião da Barra, Sintra - Sado, Sado - Sines, Sines - Burgau, Burgau - Vilamoura and Vilamoura - Vila Real de Santo António. This division was made considering singular and similar characteristics of each one of the areas and also territorial administrative boundaries.

Portuguese coastal environments are varied from the north to the south coast ranging mainly from low beaches with dunes to high-cliff beaches. Conflicts are on the contrary very similar and usually result from the difficulty of reconciling social and economic activities on the coast with natural hazards mainly relating to coastal erosion.

Coastal zone management plans provide one essential instrument to develop management approaches capable of correcting some current conflicts, as well as preventing new ones. Key principles of these plans aim at enhancing existent resources and preserving environmental and landscape values. The former are achieved through the following actions:

- spatial planning of coastal land uses and economic

activities being developed along the coast;

- beach evaluation and bathing use regulation;
- promotion and rise of the quality standards within some strategic beaches, from the environmental and the tourism viewpoints;
- setting of guidelines capable of providing favourable conditions for economic growth along the coast;
- assuring nature protection and conservation.

Regarding the former action, dune ridges and other natural buffer zones between land and sea are priorities. Whilst providing additional space for coastal processes to take place and constituting strategic sediment reservoirs, these natural defences fulfil important functions in improving coastal resilience and preventing erosion impacts. Despite these essential functions, they have suffered a major impact since decades, which has not only induced profound degradation, but even caused the disappearance of several areas.

Along the Portuguese coast, especially in the north, there are several dune ridges in fragile condition and suffering from extensive degradation. This is mainly a consequence of urbanization along the coast which has proceeded for decades near or over dune fields, without any consideration about their significant benefits. On the lower level, walking routes cutting through the dunes cause significant degradation. These routes made randomly by pedestrians and/or vehicles increase dune vulnerability to flooding and erosion.

Beyond the growing intensity of the risk linked with coastal flooding and erosion, other environmental problems to solve are related with pollution. Since in both cases the problems are connected to human settlements along the coast, either directly by the pressure induced on natural areas, or indirectly by the impact caused by economic activities, it is expected that priority should be given to spatial planning in the framework of coastal erosion hazards, risk mapping and environmental assessment.

Portuguese coastal zone management plans represent, at the regional level, the first step to achieve the former goals. They provide a comprehensive analysis of the current and future trends on coastal erosion and flooding, including the identification of buffer zones and areas at risk, as well as guidelines and priorities to beach management and use and transformation of soil in the coastal zone strip. Main constraints are related with the general lack of local information, the time available to compile and make a diagnosis on such complex matters, the exclusion of the areas under port authority jurisdiction working in prejudice of coastal sediment management and finally, the legacy of management practices with lower level of achievement in the long run.

At the local level, municipal master plans work as complement of coastal zone management plans in the

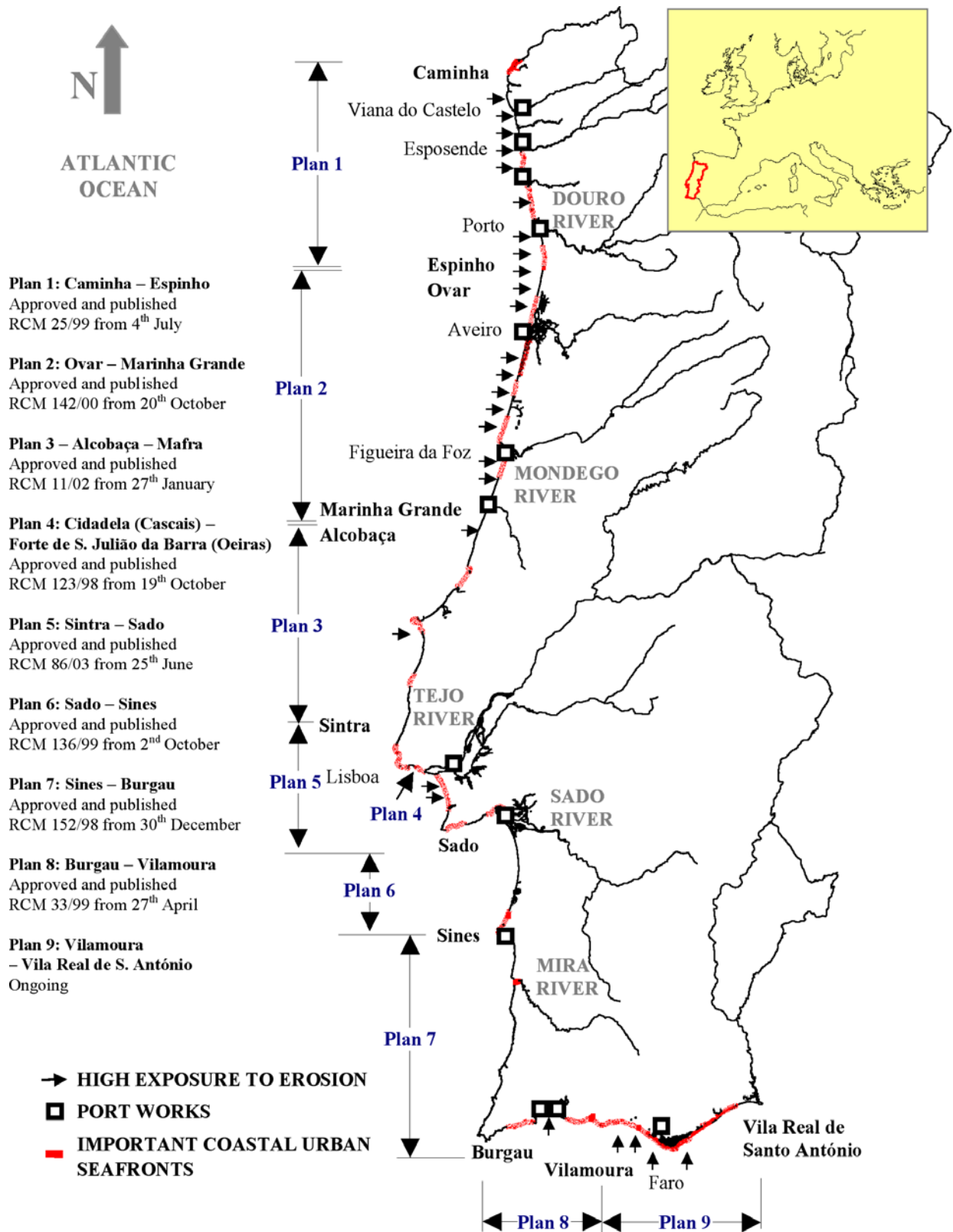


Fig. 2. Coastal zone management plans in Portugal, including areas generally affected by coastal erosion.

hinterland. In many cases these plans determine the level of pressure induced by economic activities and urban development on the littoral. Except for the areas under a special regime – Natural Parks, Protected Areas or ‘Natura 2000’ sites.

Plans 1, 5, 7 and 9 (Fig. 2) include Natural Parks and/or Protected Areas - Esposende Littoral, Sintra - Cascais, Arriba Fóssil da Costa da Caparica, SW Alentejano, Costa Vicentina, Ria Formosa (Fig. 1). It is clear that these plans will have additional constraints. Here, nature protection and conservation take priority over all other possible destinations and only development of traditional economic activities are encouraged. Other specific issues within the nine plans are related to the specific characteristics that some areas have; some of those will be mentioned here.

Within the first plan, Caminha - Espinho, covering a coastal stretch of 110 km, coastal environment is mainly characterized by low lying coastal plains of sandy beaches with dunes, alternating with fossil cliffs. At some places, rock outcrops emerge close to the shoreline; during low tide they function as natural defences. Another important characteristic of the area comprised within this plan is the existence of five estuaries, corresponding to the rivers Minho, Lima, Cávado, Ave and Douro (Fig. 2). Conflicts occurring on the coastal zone between Caminha and Espinho are related with economic activities pressure on natural areas and the increasing impacts of coastal erosion (Andersen et al. 1996).

Coastal zone management plan No. 5 concerns the smallest area, with only 10 km length, which develops entirely inside the urban area of Cascais, an important residential area close to Lisboa with also important tourism. The proposals within this plan include cliff stabilization, artificial beach nourishment operations and also regulation of beach use. Moreover, considering the large populations permanently and seasonally living in Cascais, it is essential to have suitable, well-designed and fully operational, wastewater treatment systems to avoid environmental risk caused by pollution.

The coastal zone management plans Nos. 8 and 9 are located at the south coast of Portugal, in the Algarve, which has suffered profound changes within only a few decades. It is now the area with the highest tourism development in the country. Algarve offers excellent conditions for beach recreation and particularly beach-related facilities have developed. Unfortunately, in some areas this development has proceeded in a haphazard and unplanned way which has caused major social and environmental problems. In particular, as a result of economic activities and human settlement, coastal erosion is accelerating, threatening people and some buildings. The main problems identified are related with shoreline retreating and unstable cliffs.

The importance of coastal zone management

The continuous increase of populations living in coastal municipalities, as well as economic activities being developed along the coast, were in many cases only possible after manipulating the coastal front. These technical constructions and coastal defences although offering more favourable conditions for economic growth, have resulted in a serious aggravation of coastal erosion, notably because physical processes which are influenced by the constructions have been neglected. As a result, there are many coastal areas facing imminent coastal erosion or flooding risk. This includes areas where shoreline dynamics were earlier regarded as a natural process.

Without natural rock protection and without space to let coastal processes proceed, it is impossible to stop the depletion of the coastal environment by erosion. This is all the more serious where there is an unfavourable sediment balance. Large parts of the coast of Portugal are now subject to severe erosion and several areas are in danger. From Espinho southwards – coastal zone management plan No. 2 (Fig. 2) – an estimated 140 km of coastline, mainly sandy beaches with dunes, are currently eroding or at risk of being affected by erosion. Erosion has also led to the loss or deterioration of coastal area at several places between Caminha and Espinho, as well as north of Figueira da Foz, south of Lisboa (Caparica) and in some areas of the Algarve. Fig. 1 shows the location of segments highly exposed to coastal erosion.

Human settlements along the coast together with unfavourable hydrodynamic conditions are further aggravating the coastal erosion problem of Portugal. At many places, solutions of the erosion problem are very local and have actually induced accelerating erosion processes in adjacent areas.

This development has not only led to serious problems in coastal settlements but also to the destruction of natural areas. Related to this development, intensive use of coastal areas for recreation and tourism have also led to a loss of quality of natural areas.

The proliferation of constructions on the dunes and even on beaches has now reached alarming proportions while until recently little attention had been paid to protect these essential buffer zones. The increasing extent of areas lost or seriously influenced by erosion generated a growing awareness about the importance of preserving natural sea defences (usually dune systems). This is now resulting in better coastal management approaches, where nature conservation plays a leading part. On balance, coastal urbanization and related recreation and tourism developments are exerting a very strong pressure on the coast. (Taveira Pinto & Veloso

Gomes 1997; Veloso Gomes & Taveira Pinto 1997).

To this purpose, the Portuguese Decree-Law No. 302/90 from 26 September 1990 was an important step forward. It recognizes and establishes good principles for coastal land use and transformation, as well as access to the littoral, which would be followed in coastal zone management policy instruments. The implementation of the former principles is though far from being satisfactory as recent options of management demonstrate. Either by unawareness or reluctance in accepting those principles, they remain absent in several coastal municipalities. (Veloso Gomes & Taveira Pinto 1994).

Another important aspect to be improved in the future is that concerned with making coastal management practices accountable. This means optimizing investment costs against values at risk. Coastal zones fulfil important environmental, societal and economical functions, which are often in disagreement. To know the costs and benefits of each alternative would support the process of decision-making in delivering more sustainable solutions and consequently, increasing their social acceptability.

Regarding territorial planning and management policies, priority should be given to preventive measures. These include allocating the necessary space for coastal processes to develop throughout the regulation of human settlement at areas at risk and/or prone to erosion and the creation of buffer zones between land and sea. Completion of this work is essential to improve knowledge on coastal sediment transport processes.

With respect to coastal defence measures it is evident that in areas exposed to sea action but with poor sediment supply, as is the case along the Portuguese coast, defence structures do not provide definite solutions to erosion (Veloso Gomes & Taveira Pinto 1999). They help reduce the problem but they cannot reverse the current trend of coastal erosion. In combination with these *ad hoc* solutions efforts should be made to develop and implement integrated coastal zone management plans. These should take into account recent recommendations on coastal sediment management, environmental assessment and spatial planning, as well as hazard and risk mapping.

Integration of coastal zone management in the European context

Introduction

Over the last few decades the European Union funded several ICZM demonstration programmes in different countries. The idea within these programmes was to

formulate strategies on how to address coastal issues, and conclusions highlighted the need for a Europe-wide coherent way of dealing with its coast.

Although highly acknowledged and quoted, the ICZM concept is still lacking a globally accepted definition. Generally speaking ICZM should essentially include multidisciplinary, interdisciplinary and flexible approaches identifying the most relevant societal, economic and environmental functions of coastal zones.

According to the final report to the European Commission on the EU Demonstration Programme on Integrated Coastal Zone Management 1997-1999 (Anon. 2000a), ICZM represents a process toolbox which is interactive, constantly evolving, and adapting through a variety of policy and management instruments. Many other references can be given on views on what ICZM is. However no one seems to fit all. More relevant than this discussion is the brief examination of the guidance provided by the EU Demonstration Programme on ICZM. Particularly focusing will be given on the lessons learned from the development of such programmes in Portugal.

Demonstration programmes in Portugal

Four demonstration programmes were launched in Portugal. Three were TERRA projects (Anon. 2000b): 'VALIMA: Co-operation, integrated management and sustainable development in the coastal zones of the EU', 'Algarve - Huelva (ANAS): Integrated management of the Algarve-Huelva coast', and 'TERRA CZM Algarve (Ria Formosa)'. The other was a LIFE Environment Project: 'Programme of Integrated Management for the Ria de Aveiro'.

The former actually correspond to two funded projects, MARIA within LIFE'96 and ESGIRA - MARIA within LIFE'98. The project covers an approximate area of 600 km² developing around the 110 km² of the Aveiro lagoon (Fig. 3), with an estimated population of circa 400 000 inhabitants.

Ria de Aveiro constitutes an important environmental feature in the wider European context and inclusive, it is classified as a special protection zone by the Birds and Habitats Directive. Main threats to this important ecosystem relate with coastal erosion and flooding consequence of poor sediment availability, which is mainly caused by harbouring, and damming. Other threats relate with tourism and urban development.

These projects anticipated the following results (<http://europa.eu.int/comm/environment>):

- providing better knowledge and information on the lagoon, for authorities and stakeholders;
- enhancing co-operation and information sharing between all relevant actors;
- improving spatial linking and efficiency between rel-

evant plans and programmes for the lagoon;

- promoting the sustainable development of the lagoon through suggesting a platform for its integrated management;
- sharing significant experience within the European demonstration programmes.

The objectives of ESGIRA – MARIA, were accomplished through the activities developed within four pilot projects (<http://europa.eu.int/comm/environment>):

- Pilot-project A ‘Recuperation and Optimization of the Quays’ – enabled the restoration and use of the existing quays in the various canals of the Ria and the reinstatement of their value. These are of interest and have significant potential owing to their historical and cultural importance and contribute to the revitalization of the estuarine lagoon itself.
- Pilot-project B ‘Recuperation of the Aveiro Saltpans’ – the production of salt in the Ria de Aveiro is a very old and traditional activity, once of fundamental importance to the region’s economy, but nowadays in decline. This pilot project drew up a programme for the future development of the salt works that will be a new economic activity and the safeguard the natural and landscape value of the wetland.
- Pilot-project C ‘Integrated Management of the Agricultural Fields of the Baixo-Vouga’ – elaboration of a management programme allowing agricultural activities to be implemented, and to maintain the area’s ecosystems.
- Pilot-project D ‘Classification and Management of the Área de Paisagem Protegida da Foz do Cáster’ – the implementation of measures which promote the classification and integrated management of the mouth of the Cáster as a Protected Landscape Area (APP).

One of the most significant added values of these projects was their capacity of evolving in co-operation several bodies of the central administration, from the national to the local level. The amount of knowledge accumulated over the past decades on the lagoon and adjacent areas is outstanding. However, it is spread by several sources of information which it makes it difficult for those who wish to use that information or find out more about a particular issue. Societal, economic and environmental functions of the lagoon are widely recognized but there are still several conflicts imposed by human pressure on the natural environment to be solved.

VALIMA, a project launched by the Association of the Municipalities of the Vale do Lima, was located in the north of Portugal (Fig. 3). VALIMA was a partner in the TERRA project CONCERCOST – Concertation, integrated management and sustainable development in

the coastal zones of the European Union.

Lima valley has 26 km length of coastline and covers an area of 1276 km², including the municipalities of Arcos de Valdevez, Ponte da Barca, Ponte de Lima, and finally Viana do Castelo. In this city an important harbour is located with major ship-building facilities.

In Valima, the main objective of the region was to attract industrial investments, promote it’s inland tourist assets as well as develop communication infrastructure and services in order to compete with the big urban centres such as Porto. It has drafted a strategic plan, based on structural, economic and social studies, which has been approved by the municipalities and has been submitted to the central government as a reference document for subsequent investments funding, under the third Community support framework. (Anon. 2000a)

The implementation of the strategic development plan in the Lima valley will contribute to a better management of the European Structural Funds that will be channelled to the region within the next seven years (Anon. 2000a).

In Algarve, the TERRA CZM Algarve demonstration project main scope was the wetland Ria Formosa. In the southern region of Portugal, the population is dedicated to agriculture and fishing, but mostly to tourism. Mass tourism and intensive urbanization are ongoing problems that have caused substantial changes and impacts at the levels of territorial planning and management, especially on the western side of the region. The eastern coast is less developed and rather well preserved. Here, the main coastal management concern is Ria Formosa. This area has a coastline of 60 km and an area of ca. 18 400 km². Its low-lying fragile wetland ecosystem, fringing the east coast of Algarve, deserves protective measures.

The Natural Park of Ria Formosa (established by the Portuguese Decree Law No. 373/87, 9 December 1987) is a very important biologically rich reserve with highly diversified fauna. It is covered by the Ramsar Convention, contains a special protection area for birds – in line with the Community Directive on Conservation of Wild Birds – and biotope identified in Corine.

General objectives of TERRA-CZM were related with defining a common approach for the establishment of a specific network concerning sustainable management and planning methodologies for the European coast. Main focus was to apply the concept of carrying capacity in areas of intensive tourism development. In particular, the objectives of this demonstration project, accomplished through several pilot projects, were mainly the following:

- defining integrated strategies for the development of the economic activities, including the promotion of en-

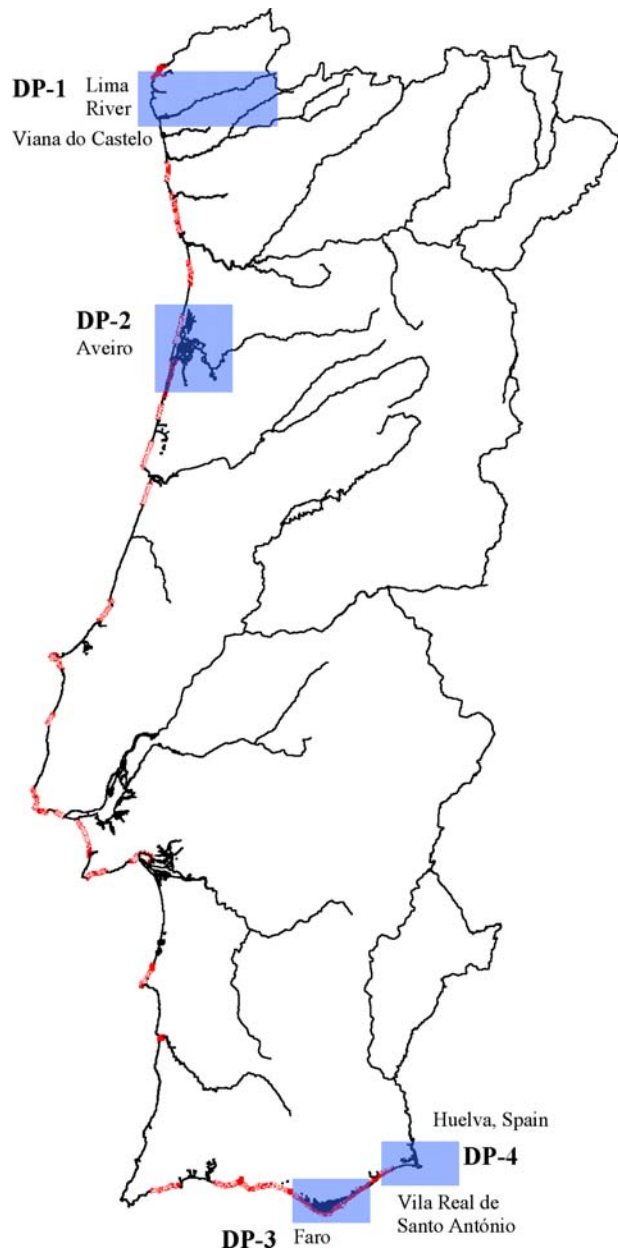


Fig. 3. Locations of Portuguese Demonstration Programs (DP).

environmentally sustainable tourism activities;

- establishing guidelines for the protection of the Ria Formosa;
- controlling harbouring activities and managing coastal facilities.

Moreover, concrete demonstration actions were implemented at the local level and also, an ICZM strategy. The CONCERCOST project assessment has demonstrated that some delays were experimented in Portugal due to an administrative change. In addition, there was an underlying conflict between environmentalists and port authorities, concerning competencies and the limits for action, which were fortunately evaluated and resolved in the project course (Anon. 2000).

The Hispano - Luso Association of Municipalities (ANAS) represents 30 municipalities from the eastern Algarve region in Portugal and the western part of the province of Huelva in Spain, with ca. 400 km of coast and a total population of ca. 600 000 inhabitants.

This association was established to co-ordinate common strategies for social and economic development of its municipalities and to tackle problems in a suitable way in order to achieve some cohesion on both sides of the border. Although spatial close, especially after the construction of the 'International Bridge over the Guadiana', there are quite significant differences on the rates of development and on how it is affecting this coastal stretch.

To the west of Faro, Algarve has been a centre of international tourism since decades, namely in Albufeira, Portimão and Lagos. One of the main characteristics of these municipalities is their intensive urban development. In recent years, with the loss of some tourism revenues there was a growing interest in exploring the added values of sports-tourism, eco-tourism and cultural-tourism.

To the east of Faro, and especially across the Spanish border in Huelva, tourism activities are less explored. Here most people are employed in the agriculture, but there is a lot of seasonal unemployment. Hence it is vital for the local economy to develop other sources of income, which tourism activities are able to provide.

ANAS was the project co-ordinator of COASTLINK, a transnational network of regional authorities covering North/South, East/West axes of Europe.

COASTLINK was strongly oriented towards the twin objectives of economic regeneration and environmental protection. The network's objectives have been to implement participation activities, conduct researches as well as producing generic recommendations for the integrated management and sustainable use of the European littoral. It was concerned with four specific themes: participation, indicators for sustainable development,

EU policies and information. (Anon. 2000).

Each partner has undertaken small demonstration projects in order to link the general spatial planning process with concrete actions visible to the citizens (Anon. 2000b). ANAS initiates the process of installing in all municipalities an information centre for citizens. It has also promoted a commercial system in order to promote the area, as well as the link of all municipalities and businesses in a website.

The main problems encountered in this project were related to the lack of homogeneity between partner skills, as well as the state of ICZM implementation and public participation (Anon. 2000).

In Algarve and Huelva the level of implementation and participation was low, and therefore ANAS mainly focused on gathering information on coastal and marine systems, as well as plans, and tried to initiate a participation process, as well as the vertical integration on coastal items (Anon. 2000).

Evolution of coastal zone management

Coastal zone management plans are the basic legal instrument of planning within the Portuguese coastal zone. However, lessons learnt from past and ongoing projects in the frame of ICZM cannot be ignored. These projects and demonstration programmes have several recommendations and findings that should be taken into account. Besides the complexity of physical processes and impacts, Integrated Coastal Zone Management also evolves a series of thematic issues, relating to legislation, regulatory systems, information flow, public participation mechanisms and procedures. It is also important as the connection and coherence between plans and programmes launched by different sectors, at different levels of administration, the role of technology and the effect of EU policies and guidelines in relevant areas. These are, however, difficult to co-ordinate.

Hence, objectives have to be accurately traced and implemented. In particular, it is crucial to start to approach the planning process with more precautions than in the past, which should ultimately result in a proactive coastal zone management policy. This is both aiming at the sustainable use and exploitation of coastal resources, as well as providing the quality of services at the level required by the society.

Several challenges are posed worldwide to coastal practitioners, related to systematic monitoring and data collection. Sustainable coastal engineering techniques with fewer impact must be studied and applied, which also would contribute to make management practices accountable, i.e. costs must be optimized against values at risk. Guidelines must be developed for mapping ero-

sion and flooding hazards and increasing the capacity building, education and training.

In the particular case of Portugal there is also a growing need for supporting administrative and governmental initiatives at various levels and in different sectors. Coastal practitioners have to be provided with improved technical and legal instruments to better structure the decision-making process. In addition, it is crucial to significantly improve the information flow, intensifying the levels of communication and the quality and quantity of information. Moreover, the involvement of stakeholders has, so far, been very restricted; therefore this involvement should be encouraged because of the significantly added value it would give to the decision-making.

A system combining the former components and factors should be able to perfectly integrate the societal, the economic and the environmental functions of coastal zones. Incorporating modern assessment technologies of field observations would further support the success of such an integrated system. Currently, there are some systems under development but so far they were not able to fulfil the required needs of all phases within coastal zone management.

The first step towards efficiently implementing ICZM in Portugal is to solve the complex juridical and institutional framework, result of the large number of entities with jurisdiction on coastal zones. The relative chaos that currently exists leads to a dispersion of capacities over several entities, and a lack of co-ordination. Moreover, there is a shortage of human resources in some of these institutions in proportion to the extension of the undertaken jurisdictional activities concerning these coastal areas. In particular, regarding the implementation of the guidelines proposed in coastal zone management plans, practice shows that there is not enough time between their elaboration and their approval and implementation. This results in the fact that some realities and trends presented in coastal zone management plans, especially in terms of shoreline dynamics, are being reached not within an horizon of 10 to 25 years, as envisaged, but in five years or less (Velooso Gomes & Taveira Pinto 2000).

Developing human resources to face the challenges posed by ICZM is another key aspect to achieve. Technology transfer is a step forward towards the former development objective, which will foster country building capacity and skills to give solution for a series of coastal zone problems.

Field observation techniques should also be encouraged. Priority should be given to comprehensive monitoring campaigns and also to the development of assessment and valuation techniques, which would enable the cartographic representation and GIS processing of so-

cial, economic and environmental values of coastal zones. Such tools would support the implementation of wiser and more sustainable decisions and in turn support the implementation of coastal zones cost-benefit assessment studies.

The challenges posed to Portuguese coastal practitioners are almost endless. There are several theoretical and practical approaches, as well as guidelines and strategies on actual issues which were in many cases developed after case studies showing potential solutions and pitfalls, and therefore it is envisaged that the practice of coastal zone management in Portugal will seek to deliver more sustainable decisions in the long term.

Past coastal management practices evidence have shown:

- Coastal zone natural resources dereliction;
 - Coastal land use conflicts;
 - Unplanned and haphazard urban development;
 - Global environmental degradation trends;
 - Shoreline dynamics and that inherent risk of natural events was neglected;
 - Seasonal tourism pressure;
 - Lack of coherent and sustainable strategies for coastal management;
 - Lack of tradition of coastal zone management;
 - Lack of integration or inadequate policies in relevant areas;
 - Differences between the legal and the natural system frontiers;
 - Contradictions between rigid or not-rigid legal systems;
 - Importance of the support of human and technical resources, an unlimited vision of a coastal zone management, and of combining science and practice.
- Therefore, there is a set of actions which in the opinion of the author would lay a foundation for better coastal management practices, namely:
- Foster a wider perspective of coastal zone management, as much integrated as possible;
 - Assessment of each site specific conditions at the social, economic and environmental levels;
 - Accurate knowledge of physical processes;
 - Promote the development of interactive, constantly evolving, and adapting through a variety of policy and management instruments management practices;
 - Involve all relevant stakeholders in the process of decision-making;
 - Assure all the necessary support, both material and human resources;
 - Combine and complement coastal management tools;
 - Improve the legal jurisdiction over coastal zones, namely by solving the problem of split jurisdiction between terrestrial and marine authorities;
 - Deliver integrated coastal zone management approaches to the specificities of each different coastal area;
 - Follow EU guidelines on ICZM;

- Develop a European Littoral Observation Agency responsible for co-ordinating EU-wide ICZM strategies.

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