

# Basis for a national strategy for integrated coastal zone management—in Portugal

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**Abstract** This paper includes the proposals made in the report “Basis for a National Strategy for Coastal Zone Management” prepared for the Portuguese Ministry of Environment, Territorial Planning and Regional Development. The final version of that report was presented in June 2006. This paper describes a theme framework followed by a discussion of concepts. Nine Primary Principles, eight Principal Objectives, and 37 Strategic Options for an Integrated Coastal Zone Management are then presented. These Strategic Options are set hierarchically according to their sequential priority, identifying the dominant types of Associated Measures. The analysis of these arrives at a set of Structural Measures, which interlink and aggregate various actions and propose a new method of integrated

management for the coastal zone, which includes the “Legal Basis of Coastal Zone”; the Organization System; the Action Plan and Monitoring.

**Keywords** Integrated Coastal Zone Management

## Framework

The report “Basis for a National Strategy for Coastal Zone Management” was prepared by a Working Group (WG) nominated by the Portuguese Ministry of Environment, Territorial Planning and Regional Development (MAOTDR). The WG mission was to develop the basis for a strategy that

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would support coastal planning policies for the entire Portuguese coastal zone including islands, in both its marine and terrestrial sectors.

The biophysical assessment of the Portuguese coastal zone must consider a range of natural conditions, of which various estuaries, lagoon systems, dune systems, cliffs, beaches and marine areas are examples. In other countries, mangroves, reefs, or ice may provide the main biophysical foundation.

Quite a number of important settlements along with various uses and economic activities are, on national and local scales, developing along the coastal zone and profiting from these natural features (Veloso Gomes *et al.* 2006b). Among them are port facilities, tourism, bathing and recreational areas, yachting, fisheries and aquaculture, as well as mineral exploitation and energy generation.

The Coastal Zone is strategically important from environmental, economic and societal points-of-view. Therefore, solving or mitigating some of its problems is of vital consideration when shaping policy for sustainable development, and needs integrated and co-ordinated management policies through recognition of the (Veloso Gomes *et al.* 2006b):

- various conflicts of interest in the coastal zone, involving open, dynamic and complex systems, interfaced and fragile areas with tremendous social and economic opportunities and as a result, with highly polarized activities and interests;
- need of identifying a platform of consensus;
- difficulty in making medium to long term predictions on the evolution of the physical, social and economic systems, which would support the preparation and combination of scenarios;
- need and difficulty in considering the interactions between the land and sea on a wider geographical level (river basins, and Atlantic Ocean);
- recent past of governmental instability, namely in respect to environment and territorial planning, supervision, and the low implementation levels of policies and programmes;
- marked social and economic constraints which are expected to continue in the coming years, calling for very pragmatic proposals to fulfill ambitious medium to long term objectives;

Finally, there is a need for wider mobilization, participation and accountability of civil society, not limited to pressure groups having specific interests, negative attitudes and corporate judgments.

### Coastal zone concepts

Because of the fuzzy concepts some designations had (in Portuguese: litoral, costa, faixa costeira, faixa litoral, orla

costeira, zona costeira, zona litoral and área/região costeira) without any consensus about their physical, political, economic and social boundaries, the WG was forced to define the following:

- *Littoral (Litoral)*—covering the whole EEZ shoreline and all the terrestrial area influenced directly or indirectly by the sea;
- *Coastal Zone (Zona costeira)*—the stretch ranging from the 200m depth line to the interior as far as tides, waves or winds reach and have an influence;
- *Coastal Stretch (Orla costeira)*—a stretch of coast which is under the direct influence of sea activity;
- *Coastline (Linha de costa)*—reference line defined as the intersection between mean height of sea level and land.

### Methodology

The methodology pursued by the WG was as follows:

- to survey and analyse relevant documents concerning national initiatives on coastal zones (Annex 1, Veloso Gomes *et al.* 2006a);
- to survey and analyse relevant documents concerning international initiatives on coastal zones (Annex 2, Veloso Gomes *et al.* 2006a);
- to hold meetings with all relevant institutions and participate in a seminar promoted by the National Council for Environment and Sustainable Development;
- to perform a SWOT analysis on the following key subjects (Annex 3, Veloso Gomes *et al.* 2006a):
  - ◆ Biophysical Support (e.g. Estuaries, Lagoon Systems, Dunes, Cliffs, Beaches, Marine Areas, Areas of Special Interest for Conservation);
  - ◆ Uses, Activities and Vulnerabilities (e.g. Urbanization, Vulnerabilities, Risk, Ships and Ports, Tourism and Recreation, Bathing Areas, Yachting, Fisheries, Aquaculture, Energy, Mining, Pollution, Natural Hazards and Climate Change);
  - ◆ Management (e.g. Coastal Zone Rehabilitation, Shoreline Public Domain, Legal and Policy Instruments for Coastal Zone Management, Control and Surveillance, Jurisdiction and Administrative Systems, Integration and International Cooperation, Monitoring, Raising Social Awareness, Scientific Research, Civic and Environmental Education and Public Participation);
- selection and proposal of Primary Principles for a National Strategy for Integrated Coastal Zone Management;

- proposal of Principal Objectives for a National Strategy for Integrated Coastal Zone Management;
- proposal of *Strategic Options* that include the Principal Objectives;
- proposal to set the Strategic Options hierarchically according to their temporal priority, identifying the dominant type of the Associated Measures;
- proposal of Programmes and Actions associated with the Strategic Options priorities;
- delivered a Draft Report of the WG to the ministry Environment on January 9, 2006 which included the above-mentioned proposals; it was suggested that this Draft Report be prepared with a view to gathering contributions from the main institutions with management jurisdiction in coastal zones, non-governmental organizations and stakeholders through a process of public discussion and participation;
- January 26, 2006—press conference held at S. Pedro do Estoril about the Draft Report;
- January 27–28, 2006—dissemination of the Draft Report at a workshop at the New University of Lisbon (Costa da Caparica);
- February 10, 2006—after deliberation by MAOTDR the contents of the WG Draft Report except for the “Programme and Actions associated to the priority *Strategic Options*” were submitted to public discussion and presentation (Lisbon, LNEC);
- February 23, 2006—discussion of the WG Draft Report with the Nation Association of Municipalities (Coimbra);
- some of the outcomes of this process of public discussion and participation were then incorporated into the WG Report.
- In 2007, the Report was published in a book edited by MAOTDR (Veloso Gomes *et al.* 2007).
- *Systematic framing*; aims at creating a new management approaches by means of promoting a transverse theme and intersectoral and interdisciplinary approaches which envisage an integrated coastal management future;
- *Scientific and technical support*; intended to assist in the process of coastal management and territorial planning/decision-making by providing essential knowledge about coastal processes and their dynamic evolution;
- *Subsidiarity*; aspires to coordinate procedures at different levels of public administration in order to give due privilege to decisions that are as close as possible to the citizens made by the lowest-level competent authority.
- *Participation*; aims at enhancing the active involvement of people, institutions and local stakeholders and by raising social awareness through facilitating access to information and permitting a wider role in the development, implementation, evaluation and review of administrative procedures;
- *Shared commitment*; by assigning a share of responsibility in the options for management of the coastal zone between all the stakeholders, not only by the user and polluter-pays principles, but also by seeking institutional forms that allow for management that is closer to citizens and users of the coastal zone;
- *Operability*; through creating legal, institutional, financial and programme procedures that are rapid, effective and funded with their own sources to assure that the objectives and interventions are properly achieved.

### Primary principles

The *National Strategy for Coastal Zone Management* should observe the following nine Primary Principles:

- *Sustainability and interregional solidarity*; aimed at promoting compatibility between social and economic development and the conservation of nature and biodiversity, with a vision to providing a high quality of life for current and future generations;
- *Cohesion and social equality*; intended to ensure social and territorial balance in regard to distribution of resources and opportunities;
- *Prevention and precaution*; focuses on preventing or anticipating problems, mitigating risks or adverse impacts and at taking recommended approaches recognising lacks in knowledge and intervention capacity;
- *Integration and International Co-operation*;
- *Enhancement and Reinforcement of Institutional Communication*;
- *Conservation of Resources and of Natural and Landscape Heritage*;
- *Rehabilitation of Coastal Zones and Sustainable Development of Activities and Uses*;
- *Mitigation of Risks and Social, Economic and Environmental Impacts*;
- *Integrated Policies based on medium to long term predictions*;
- *Public Participation and Raising Social Awareness and Knowledge*;

### Principal objectives

The basis of a National Strategy for *Coastal Zone Management* requires an assertion that the coastal zone be regarded as a continuous and strategic territory for national development, which is expressed in eight Principal Objectives:

- *Integrated Evaluation of Policies and Coastal Zone Management Instruments.*

### Strategic options

The Strategic Basis for the spatial planning and integrated management of the Portuguese coastal zones, continent and islands, in both terrestrial and marine components, is founded on eight *Principal Objectives*, which in turn are incorporated within 37 *Strategic Options*:

#### *Integration and International Cooperation*

- *Encourage cooperation between states* through strengthening the enforcement of agreements, conventions and current directives and participation in new initiatives, namely among the Community of Portuguese-speaking Countries (CPLP);
- *Strengthening mechanisms for resolving cross-border issues*, through the formulation and operation of Emergency Plans between member states, continuous monitoring of the management of international river basins, and implementation of the EU's new Maritime Strategy;
- *Ensure Integrated Coastal Zone Management (ICZM)* through the establishment of new forms of institutional relationships, the use of structural funds, implementation of specific technical criteria adjusted to the reality of Europe and adoption of a system of indicators;
- *Devising mechanisms to evaluate and to adjust EU policies*, through on-going appraisal of specific EU programmes and their international application;
- *Strengthening the mechanisms of integration and coordination of EU policies at the national level* through establishing a forum between ministries, with representatives from the autonomous regions, to ensure a good integration of policies and creation of links between science, policy and practice in coastal management;
- *Reinforce the national geo-strategic position* by attracting international agencies, as well as promoting active participation in forums, programmes, and delegations.

#### *Enhancement and Reinforcement of Institutional Communication*

- *Redesign the current legal framework and integration into the "Law Basis of Coastal Zone"*, ensuring the integration and coordination of the various legal decrees in force, bridging gaps and creating skills for intervention;
- *Combine the coordination and accountability of ICZM in one national managing body*, with the aim of reducing fragmentation of responsibilities, ensuring correct institutional co-operation, harmonizing deci-

sions at the national level and supporting management, control and monitoring;

- *Rearrange jurisdictions*, by giving new powers to a central government body which will be responsible for the implementation of ICZM in the field, based on the principles of subsidiarity and shared commitment, as well as for the fulfilment of the national strategy;
- *Increasing the institutional mechanisms of national co-operation*, through the creation of a National Network for Coastal Observation (RNOC), coordinated by the central government body but involving all sectors, from science to practice and policy, on the same platform;
- *Create a platform for discussion*, through the establishment of a national forum targeting the integration of national policies and the implementation, participation and dissemination of ICZM.

#### *Conservation of Resources, Natural and Landscape Heritage*

- *Integrate and enhance the natural heritage and landscape*, through implementation of sustainable practices of management and consequent evaluation;
- *Ensure the integration of cultural heritage in the National Network for Conservation of Nature*, retaining the specific characteristics of interface areas and both the marine and terrestrial components;
- *Make the various uses of the coastal zone compatible with nature conservation and the values of the landscape*, through spatial planning and regulation of uses and activities, favouring multifunctionality.

#### *Rehabilitation of Coastal Zones and Sustainable Development of Activities and Uses*

- *Enhancement of man-made landscapes, urban or rural areas*, to optimise the societal use of coastal and marine resources;
- *Match the various uses and leisure activities*, through spatial planning and regulation of uses and activities, optimising multifunctionality and valuation as much as possible;
- *Integrate ICZM in the plans for areas under military or port jurisdiction and in protected natural or marine areas*, through instruments of territorial management, mechanisms for integration and shared commitment and environmental certification;
- *Enhance shipping activities*, through the planning and the upgrading of the support facilities and the application of new technologies to watercraft and traffic control, as well as the promotion of marine cabotage;
- *Promote sustainability in fisheries and related activities*, considering the resources available and the strategy for sea, lagoon and estuarine systems;



- *Promote good management in mining and dredging activities*, through the evaluation and minimisation of impacts, especially on coastal erosion;
- *Action Plan for valuation of coastal areas*, determine a set of short-term interventions, to optimise the societal use of coastal and marine resources;
- *Encourage the use of innovative technology, processes of intervention and exploitation of resources*, through the development of mechanisms aimed at optimising the societal use of coastal and marine resources.

#### *Mitigation of Risks and Social, Economic and Environmental Impacts*

- *Priority for areas at risk due to natural and anthropogenic phenomena*, through the implementation of operational programmes to mitigate the short-term critical situations based on the priorities defined;
- *Safeguarding of areas more vulnerable and/or at risk*, restricting settlements based on predicted coastal dynamics;
- *Encourage cost-benefit analysis for all interventions*;
- *Harmonize emergency intervention*, through the shared commitment of coastal authorities and training of human resources.

#### *Integrated Policies*

- *Increase the time span of spatial and management policies*, by considering existing knowledge on coastal dynamics, global changes on wider scales and through the integration of warning mechanisms;
- *Ensure that the implementation of policies includes adjacent areas*, as part of a strategic vision for the coastal zone that considers specific locations and the municipalities;
- *Amend instruments of territorial and environmental management*, through the implementation of coastal zone management tools that co-ordinate and integrate a range of sectoral policies considering the dynamics and vulnerability of coastal areas, and establishing criteria in the various instruments of territorial administration for use, monitoring and supervision;
- *Establish specific structural funds and create encouragement systems*, which ensure the maintenance and/or recovery of the specific characteristics of coastal zones.

#### *Public Participation and Raising Social Awareness and Knowledge*

- *Foster shared commitment and accountability*, by providing knowledge and technical training to key stakeholders;

- *Encourage public participation*, through capacity building, education, training, dissemination and raising awareness of different target audiences;
- *Promote scientific research*, through multi and interdisciplinary projects and innovation;
- *Incorporate ICZM at the different levels of education*.

#### *Integrated Evaluation of Policies and Coastal Zone Management Instruments*

- *Ensure assessment and continuous monitoring*, through the use of innovative, consistent and comprehensive approaches;
- *Track and monitor the implementation of integrated policies*, by the application of evolving models of monitoring with significant scientific support;
- *Increase supervision*, by giving to coastal zones the national importance they deserve, as well as by promoting preventive measures and consistent adherence to the legal framework.

#### **The strategy for the short and medium/long term**

The main Objectives and Principles to observe in the National Strategy for Integrated Coastal Zone Management, as well as the Strategic Options identified for accurate spatial planning and management over the next 20 years, require the development of a set of short term measures in priority domains, following the Strategic Options.

These Strategic Options were set hierarchically according to their temporal priority (table included in Veloso Gomes *et al.* 2006a), identifying the dominant type of Associated Measures, which are aggregated in:

- A Jurisprudence, Institutions and Administration;
- B Finance and Operation;
- C Human Resources.

This hierarchy is result of a matrix analysis, aimed at the operationability of the Strategic Basis, as well as the measures and priority actions deemed necessary for its full achievement.

For implementation of the identified strategy the need to change the current legal, institutional and administrative framework is clear, as the proposed Integrated Coastal Zone Management is established on a new model of management, as well as on a new concept of territory within the coastal zone.

Twenty out of the 37 proposed Strategic Options were classified as priority—to be achieved in the short term. These have significant dependence on legal, institutional

and administrative measures, but even so it is anticipated that a number of financial and operational measures, as well as allocation and reorganization of human resources will be implemented in the short term.

To support the actions behind the Strategic Options which are defined as priority, the Report incorporates a Programme Contents, which is not detailed in this paper but can be found in Veloso Gomes *et al.* (2006a).

## Structural measures

### Introduction

From the previous analysis comes a set of Structural Measures, which interlink and aggregate various actions, and design a new way of integrated management for the coastal zone, which includes the “Legal Basis of the Coastal Zone”; the Organization System; the Action Plan and Monitoring.

### Legal Basis of the Coastal Zone

The development of the Strategy for Integrated Coastal Zone Management (ICZM) should be based on a new legislative framework that builds on the articulation and integration between existing tools, for enabling a new system of management and planning.

Hence, the “Legal Basis of the Coastal Zone” has to confirm the principles of management, to clearly establish their objectives and define explicit levels and territorial areas for intervention. It should also provide a redefinition of power by reinforcing the national coastal authority and the relational network between institutions, including RNO and the Observatory for the Coastal Zone. To this document ought to also be assigned the role of establishing the national criteria standards for interventions in the Coastal Zone, ensuring desirable objectives of sustainability, namely in what concerns the Shoreline Public Domain.

In order to match the interests and establish an effective system of management, the “Legal Basis of the Coastal Zone” should also include the principles, objectives and contents of any sectoral Instrument for Territorial Management (ITM). It will explain various scenarios and options in regard to coastline evolution, the major options of the Strategy For Integrated Coastal Zone Management, as well as several additional planning requirements. Among these it is important to highlight the amendment of the Coastal Zone Management Plans (POOC), the plans for areas under military or port

jurisdiction, protected natural and marine areas, the relationship between all Instruments of Territorial Management (IGT), as well as dredging management and systems of compensation, participation and monitoring.

### Organization system

The new legal framework should result in a new scheme of institutional organisation, alongside the creation of networks and forums, encouraging more comprehensive and timely forms of communication.

The new organization will facilitate links between different policies at various national and territorial levels.

The effective information flow across all sectors of administration, as well as its real impact on decision making, has to be pursued through mechanisms of participation, coordinated by a national managing body.

The powers of this national body, to be defined in the “Legal Basis of the Coastal Zone”, also include monitoring, access to information and supervision.

### Action plan

All interventions for territorial improvement that result from the Instruments of Territorial Management in force, especially those concerning situations of risk to people or assets, those requiring complex institutional articulation, as well as those providing good practices in coastal zone rehabilitation, ought to be set as priority interventions.

To establish these a multivariate analysis has to be implemented. Other weight factors comprising the specific characteristics of each region concern biodiversity, erosion rates, development rates, and ongoing social and economic activities.

In the short term, the need to devise an Action Plan to promote the creation of mechanisms necessary to implement the interventions identified as priority is a principal goal emerging from the Basis for a National Strategy for Coastal Zone Management. These priority interventions are those that, on the one hand cope with high risk situations, and on the other hand provide good practices contributing to a new impetus toward the new vision for coastal areas.

To achieve these may depend of the alignment of management powers assigned to each of the entities that have some local responsibility for coastal zones. In particular, through their Political Administration Statutes the Autonomous Regions of Madeira and Azores should foresee some effort to get an approach that is consistent with the rest of the Portuguese territory.

Along with this, it is necessary to reinforce technical and scientific knowledge and to further involve citizens in the

amendment of the legal framework, including important issues associated with the areas of harbour jurisdiction and Shoreline Public Domain.

### Monitoring

Monitoring has an essential role in ensuring that the management policies are the most appropriate and that the anticipated impact of interventions are as expected. Frequent monitoring allows assessment of the success or failure of planning interventions, measuring changes and to responding to unforeseen situations in due time.

Besides the critical monitoring of biophysical parameters a wider perspective must be considered, where monitoring of the Instruments of Territorial Management and monitoring of policies, action plans and projects are also undertaken.

In regard to monitoring environmental parameters, there are already some guidance in the Coastal Zone Management Plans, the River Basin Plans, the monitoring of bathing areas and the Portuguese Continental Shoreline General Monitoring Plan (with a relevant coastal physiography component that is necessary to disseminate and evaluate). The recent MONAE project (Annex 1, Veloso Gomes *et al.* 2006a) also provides pertinent guidelines for monitoring the water quality and ecology of the coastal zone.

Through the monitoring of a number of parameters (system of indicators), it is possible to acquire the information necessary to tailor actions within the development planning process, allowing for early intervention according to the need for amendment, correction, revision, or even deferral. Monitoring helps determine the adequacy of policies in changing coastal conditions.

### Conclusions

The discussion and proposals presented here are the result of intense work and reflection by a team with expertise and experience, and a careful reading of many studies published by the technical and scientific community.

The capacity to implement and to realize Institutional Programmes and Policies on the Portuguese Coastal Zone are their early stages, envisaging the significant challenges which confront society and local communities.

If this opportunity to endorse and launch a strategy for the Integrated Coastal Zone Management in Portugal is not seized – clearly beyond the scope of one ministry – it may be too late for sustainability.

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### References

- Veloso Gomes F, Barroco A, Ramos Pereira A, Sousa Reis C, Calado H, Gomes Ferreira J, da Conceição Freitas M, Biscoito M (2006a) Bases para a Estratégia da Gestão Integrada das Zonas Costeiras. Relatório para o Ministério do Ambiente, Ordenamento do Território e do Desenvolvimento Regional
- Veloso Gomes F, Taveira Pinto F, das Neves L, Pais Barbosa J (2006b) EUrosion. Pilot Site of River Douro – Cape Mondego and Case Studies. A European Initiative for Sustainable Erosion Management. IHRH e FEUP (eds.). ISBN 972-752-074-x. 339 pgs
- Veloso Gomes F, Barroco A, Ramos Pereira A, Sousa Reis C, Calado H, Gomes Ferreira J, da Conceição Freitas M, Biscoito M (2007) Bases para a Estratégia da Gestão Integrada das Zonas Costeiras. Ed. Ministério do Ambiente, Ordenamento do Território e do Desenvolvimento Regional. 1ª edição. ISBN 978-989-8097-06-4