Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem

MedPartnership

Together for the Mediterranean Sea

GEF UNEP

An Integrative Methodological Framework (**IMF**)

for coastal, river basin and aquifer management Towards converging management approaches for Mediterranean coastal zones

UNESCO

PAP/RAC

Global Water Partnership Mediterranean

Note

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APELL	Awareness and Preparedness for Emergencies at Local Level
B.C.	Before Christ
BR	Biosphere Reserve
CAMP	Coastal Area Management Programme
CB/MEP	Capacity-Building/Mediterranean Environment Programme (Horizon, 2020)
CBD	Convention on Biological Diversity
CD	Compact Disc
CEM	Commission on Ecosystem Management
CEMAT	European Conference of Ministers Responsible for Spatial/Regional Planning
CIS	Common Implementation Strategy
COP	Conference of Parties
CSO	Civil Society Organization
2D	Two Dimensional
DPSIR	Driving Forces-Pressures-State-Impacts-Responses
DVD	Digital Videodisc
EEA	European Environment Agency
EBA	Ecosystem-based Approach
EC	European Commission
EcAp	Ecosystem Approach
ECI	European Citizen's Initiative
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EP	Environmental Planning
ESD	Education for Sustainable Development
ERM	Environmental Resource Management
EU	European Union
EU MED EUWI	Mediterranean Component of the EU Water Initiative
EU SWIM-SM	European Union Sustainable Water Integrated Management-Support Mechanism
FAO	Food and Agriculture Organization
FP7	7th Framework Programme
GCF	Global Climate Fund
GEF	Global Environment Facility
GES	Good Environmental Status
GIS	Geographic Information System
GWD	Groundwater Directive
GWP	Global Water Partnership
GWP-Med	Global Water Partnership – Mediterranean
Ha	Hectare
ICAM	Integrated Coastal Area Management
ICCD	International Convention to Combat Desertification
ICM	Integrated Coastal Management
ICMM	Integrated Coastal and Marine Management
ICT	Information and Communications Technologies
ICZM	Integrated Coastal Zone Management
IDM	Integrated Drought Management
IEM	Integrated Environmental Management
IFM	Integrated Flood Management
IGWM	Integrated Groundwater Management
IHP	International Hydrological Programme
IMF	Integrative Methodological Framework
IMP	Integrated Maritime Policy
IPPC	Integrated Pollution and Prevention Control
IRBM	Integrated River Basin Management
IUCN	International Union for Conservation of Nature

IUWM	Integrated Urban Water Management
IWRM	Integrated Water Resources Management
km2	square kilometre
LDC	Least Developed Countries
LME	Large Marine Ecosystem
m^3	cubic metre
MAB	Man and the Biosphere
MAP	Mediterranean Action Plan
MEdIES	Mediterranean Education Initiative For Environment & Sustainability
MedPartnership	Strategic Partnership for the Mediterranean Large Marine Ecosystem (LME)
MeHSIP-PPIF	Mediterranean Hot Spots Investment Programme – Project Preparation and Implementation Facility (Horizon 2020 initiative)
MENA	Middle East and North Africa
MIO-ESCDE	Mediterranean Information Office for Environment, Culture and Sustainable Development
MoU	Memorandum of Understanding
MSFD	Marine Strategy Framework Directive
MSP	Maritime (or Marine) Spatial Planning
MSSD	Mediterranean Strategy for Sustainable Development
NAMAS	Nationally Appropriate Mitigation ActionS
NAP	National Action Plan
NCWR	Non-Conventional Water Resources
Nexus	Water-Energy-Food Nexus
NGO	Non-Governmental Organization
OECD	Organisation for Economic Co-operation and Development
PAP	Priority Actions Programme
PEGASO	People for Ecosystem-based Governance in Assessing Sustainable Development of Ocean and Coast
PP	Public Participation
PPP	Public-Private Partnerships
PSU	Practical Salinity Units
RAC	Regional Activity Centre
RBM	River Basin Management
RBMPs	River Basin Management Plans
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
SAP	Strategic Action Plan
SAP-BIO	Strategic Action Plan for Biodiversity
SAPMED	Strategic Action Plan for the Mediterranean
SD	Sustainable Development
SEA	Strategic Environmental Assessment
SIWI	Stockholm International Water Institute
SPA/BD	Specially Protected Areas / Biological Diversity (Protocol to the Barcelona Convention)
SUDECIR	SUstainable Development in European CIties and Regions
SWOT	Strengths, Weaknesses, Opportunities, Threats (Analysis)
TAC	Technical Advisory Committee
TB	Transboundary
TEC	Technical Committee
TOR	Terms of Reference
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
US$	US dollar
VED	Vital, Essential and Desirable
WB	World Bank
WFD	Water Framework Directive
WMO	World Meteorological Organization
WWF	World Water Forum

Foreword

The coastal zone, simplistically defined as the area of interaction between the land and the sea, is a territory that has attracted humans throughout history. It includes enclosed gulfs, bays and estuaries that are suitable for developing settlements and economic activities, and for building marine and riverine ports, often hosting fertile pl*a*ins and sites abundant with surface and groundwater. Terrestrial, freshwater and marine ecosystems found in the coastal zone are among the most productive on the planet. These ecosystems are also among the most complex to study, and to manage, and are the most threatened. The coastal zone is the site of active geological processes including erosion, sedimentation, alongshore and onshore sand transport, shoreline changes, wind/tidal flooding and dune accretion. It represents open and dynamic systems with numerous interactions within themselves ("internal") as well as with the wider natural and man-made environment beyond their boundaries ("external"). Significant changes at any point and in any part of these systems may generate chain reactions far from their point of origin, and possibly in a totally different system, whose environmental conditions could be altered subsequently (UNEP, 1995).

The general public, including the coastal inhabitants, often do not fully perceive these interactions and their potential magnitude. Only when major extreme events hit and cause casualties and property losses do the public and, often, decision makers too, realize the complexity and vulnerability of coastal zones. Science continuously provides new evidence about the links within and between related systems. Populations living in and economic sectors acting on the coastal zones, with direct dependency on coastal resources, are often concerned mostly about their rights to develop and exploit advantages without adequately addressing the impacts of their activities on the various environmental and social aspects. Coastal populations, particularly in estuarine areas, expect from those living inland and upstream to preserve the rivers and secure good environmental conditions for downstream users without, however, necessarily managing their part of the river downstream in a sustainable way. Having in mind that 80 per cent of the pollution load received by the Mediterranean Sea derives from land-based sources, a considerable part of which comes in through rivers, such a request is clearly legitimate. However, coastal populations requesting the right to a clean environment, primarily as a prerequisite for their development, often forget the right for development of the upstream communities (e.g. irrigated agriculture, energy generation). In other cases, early development downstream may have already unfavourably affected water allocations for upstream countries, communities or sectors, a situation that, in many cases, is very difficult to rectify. These examples emphasize the need for applying approaches throughout the water basin, and including groundwater bodies, with particular attention to the coastal areas. Furthermore, coastal development and the subsequent marine pollution, combined with intensive fishing, may severely affect offshore marine ecosystems, fish stock in particular.

Climate variability and change exacerbate and further complicate the existing environmental, socioeconomic and cultural problems in coastal areas.

Over the last few decades, several management approaches have been developed to respond to anthropogenic impacts on the terrestrial, freshwater and marine environment. Among them, the Integrated Coastal Zone Management (ICZM), the Integrated Water Resources Management (IWRM) and, more recently and less widespread, coastal aquifer and groundwater management. Consequently, several international legal agreements

and conventions have been developed covering the aforementioned issues, separately or in combination, which also refer to the Mediterranean.

The Manila Declaration on "Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities" (2012), signed by 64 governments and the European Union (EU), stressed among other matters the need and announced the decision to improve cooperation and coordination at all levels to deal with issues related to oceans, coasts, islands and their associated water needs by applying integrated management approaches. These include the "ridge-to-reef" concept, involving stakeholders and developing innovative solutions, to improve situations and research problems identified (Manila Declaration, Art 7, UNEP/GCSS, XII/INF/10).

To respond to international/regional legal provisions and address challenges in coastal areas, Mediterranean countries are often called on to prepare specific strategies and plans, many of which are related to subnational/local and/or sectoral development (such as for tourism, fisheries, agriculture, shipping and energy). To become operational, most of these plans require some kind of integration (e.g. of objectives) and coordination (e.g. of executive agencies). In this respect, the Protocol on ICZM in the Mediterranean of the Barcelona Convention (UNEP/MAP/PAP, 2008) is one of the few international legal instruments that provide grounds for such an integration and coordination towards the sustainable development (SD) and improvement of living conditions of coastal populations.

The ICZM Protocol covers the coastal zones of all the Mediterranean countries. It provides legal requirements to holistically take into account the terrestrial and marine parts of the coastal zone at national and local level, where the interactions between and within the coastal ecosystems are prominent and must not be neglected by management. Furthermore the Protocol explicitly refers, in article 9 para. 1c, to the need to ensure respect for IWRM as well as to environmentally sound waste management.

Two United Nations conventions, namely the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (United Nations Economic Commission for Europe (UNECE) Water Convention, Helsinki, 1992) and the Convention on the Law of the Non-Navigational Uses of International Watercourses (New York, 1997) refer to transboundary water resources. National water resources are not addressed by any international or regional regulatory/legally binding documents, except for the Protocol on Water and Health (1999) under the UNECE Water Convention.

Since several Mediterranean countries are members or in accession process to the EU, it is appropriate also to consider the relevant EU legislation. The existing EU acquis include a range of related directives including the Water Framework Directive (WFD, 2002) and its daughter directives on Groundwater (2006) and Floods (2007); the Marine Strategy Framework Directive (MSFD, 2008); and the Maritime Spatial Planning Directive (MSP, 2014) which establishes a framework for maritime spatial planning. These provide a useful framework for the management of freshwater systems and the marine environment. They echo the high value attributed to water and other natural resources constituting a helpful guiding framework even for countries outside the EU where, of course, such legislation is not binding. From this point of view, key EU Directives are also considered in the present work as source documents. It is noteworthy that although the coastal zone is addressed to a certain extent, directly or indirectly, by the aforementioned directives it is not in the focus of any specific EU legislation.

The fact that ICZM is a dynamic process towards sustainable management and use of specific coastal zones and their resources may imply site-specific provisions as well as, eventually, somewhat differentiated approaches between EU and non-EU Mediterranean countries, including when implementing the ICZM Protocol. However, the

ultimate goal of achieving SD remains common. The EU Directives follow the Ecosystem Approach (EcAp) which aims at the achievement of Good (environmental/chemical) Ecological Status (GES) of the (water) resource in question as a prerequisite for sustainability. It should be emphasized that EcAp is one of the general principles of the ICZM Protocol in the Mediterranean (article 6) and although the achievement of good environmental status (GES) is not explicitly mentioned, it is implicitly considered. The ICZM Protocol refers to all coastal resources, not only the aquatic ones, in both the terrestrial and marine parts of the coastal zone. Moreover, besides the management of resources, ICZM is also about the management of uses. Overall, the implementation of EcAp has been adopted as a key guiding principle of the Barcelona Convention. Decisions IG 17/6 (COP 15, 2008) and IG 20/4 (COP 17, 2012) for the "Implementation of the ecosystem approach to the management of human activities" and for "Implementing MAP ecosystem approach roadmap", respectively, articulate a systematic process towards more effective ecosystems-based management, followed by a seven-step road map for the implementation of the EcAp by the Mediterranean Action Plan (MAP), i.e. the EcAp process. Therefore, an important aspect of ICZM, demonstrated in the present document, is its ability to facilitate bridging the GES and EcAps with regional development that also corresponds to optimal management solutions for sustainable coastal development. Such management should also respond effectively to the increasingly complex challenges resulting from the impact of climate change on the coastal zone and the efforts to adapt to climate variability and change.

Of importance for developmental efforts in the coastal zone, the Water-Energy-Food Nexus (Nexus) approach was introduced relatively recently in the global natural resources management agenda. Its aim is to facilitate the enhancement of water, energy and food security, while preserving ecosystems and their functions, including under conditions of climate variability and change. It focuses on increasing the efficiency and productivity of resources, reducing trade-offs, shifting towards more sustainable consumption patterns and improving demand management, building synergies and improving governance across sectors. With some differences from previous integrated approaches, the Nexus approach starts from a balanced cross-sectoral perspective considering the biophysical, economic and institutional dimensions of natural resource management, analysing the flow of these resources through different sectors and detecting entry points for reducing inefficiencies and exploiting synergies between sectors. Often, the Nexus addresses only parts of the water-energy-food triangle; for example, it can be concerned with water–energy, water–food or energy–food, as well as their linkages with environment, climate, land, waste, etc.

Within a joint initiative, the Priority Actions Programme/Regional Activity Centre (PAP/RAC) of United Nations Environment Programme/ Mediterranean Action Plan (UNEP/MAP), United Nations Educational, Scientific and Cultural Organization (UNESCO)-International Hydrological Programme (IHP) and the Global Water Partnership-Mediterranean (GWP-Med) wish to propose a comprehensive, yet comprehensible, Integrative Methodological Framework (IMF) and an operational methodology for the sustainable management of the ecological continuum constituted by the coastal zone, the river basin and the coastal aquifer. The present document aspires to encourage and facilitate planners, practitioners and interested parties towards a shared, efficient and effective use of the relatively limited human and logistical resources usually available in most Mediterranean countries, and achieve better coordination, integration and involvement of all stakeholders, including the general public, in the planning process.

Reader's Guide

The present document is designed to provide an IMF and planning guidelines to assist the development and convergence of assimilated solution-oriented coastal management approaches and plans. Such plans are requested by the ICZM Protocol for the Mediterranean, and need to be drafted with special attention to the associated watershed management requirements for surface water, groundwater and coastal aquifers (several of which are particularly "vulnerable") as well as to the management needs of the marine environment, also addressing effectively the challenges related to climate variability and change (see box on the next page).

The publication is designed to inspire and facilitate integrative planning and management in a flexible way to allow their implementation at national and local level. Adaptation to individual local conditions may dictate amendments to this process within the overall framework. On the other hand, eventually the framework can easily be used, with some modifications, for coastal areas outside the Mediterranean.

Target Audience

The key target audience of this publication are administrations, practitioners and partnerships tasked with the production and implementation of management plans related to coastal areas in the Mediterranean (ICZM, IWRM and other). Estuaries are the point at which ICZM and IWRM meet, and as these are among the areas most threatened by sea-level rise and climate variability and change, this publication is particularly relevant for those seeking sustainable solutions, including through adaptation to climate change, for this part of the coastal zone.

Four Key Lessons from the IMF Process

The collaboration between the three partners in drawing up the IMF has been combined with operational testing in the transboundary coastal zone of Albania and Montenegro through the elaboration of an integrated plan for the Buna/Bojana area. 'Buna' is an Albanian and 'Bojana' a Montenegrin name for the same river.

From these parallel exercises, and drawing on the partners' extensive experience across the Mediterranean region, many lessons have been learned. In particular, four key lessons have been distilled from the process and are identified and elaborated within the publication using, where relevant, on-the-ground illustrations from the process used to deliver the integrated plan for the Buna/Bojana area:

- Key lesson 1 Convergence of approaches, including a common definition of integration, is key
- Key lesson 2 The value of the Drivers-Pressures-State-Impacts-Responses (DPSIR) framework as a tool for integration is high.
- Key lesson 3 Operational practicalities should remain lean: the value of a simple and common road map that is adaptable to local circumstances is recognized.
- Key lesson 4 The focus is on delivering results: realizing the vision renders the process valid.

The key lessons are elaborated upon at relevant points in the document.

IMF and operational guidelines

The IMF and operational guidelines are intended to:

- identify possibilities and solutions for converging coastal, river basin, aquifer and groundwater management, considering also the implementation of the ecosystem approach
- integrate climate change considerations as cross-cutting issues throughout the planning and implementation processes in coastal zones
- support an active involvement of stakeholders and of the general public in the planning and management of coastal zones.

The document is divided into two sections:

- Section I: Concept of the IMF
- Section II: Operational guidelines.

Section I provides the conceptual framework for integrative management and planning of these zones. It offers to the reader the general background, clarifications and knowledge for understanding the objectives, processes, methodologies and key issues within different complementary integration approaches in order to build the foundations for all-embracing joint/integrated solutions.

Section II provides a step-by-step guide to an integrated planning process. It takes the reader through the objectives, activities and outputs of each stage, and proposes methodologies, tools and examples towards an integrated plan as the main end product.

Specific objectives of the IMF

The specific objectives of the IMF are to:

1. provide the rationale and the technical tools for a collective and coherent response to the multiple policy goals and directives that relate to the utilization, development and protection of coastal areas at national and local level and their natural and ecological resources
2. ensure that policy instrument mixes are consistent and mutually supportive
3. produce policy outcomes appropriate to the context of the specific coastal zone problem
4. secure the best knowledge base and support the interdisciplinary approach needed for the successful preparation of an integrated plan
5. add value to individual approaches in order to obtain maximum synergy responding to the principle that the whole is greater than the sum of the parts
6. satisfy different legal requirements through a shared, efficient and effective use of often limited human and logistical resources available for such a process, including reducing costs for planning and particularly for the setting and implementation of management options identified in the plan
7. respond effectively to the more dynamic environment resulting from climate change and development impacts
8. achieve shared ownership by the involved sectors through their better coordination and integration in the planning process
9. achieve sustainable coastal development in the Mediterranean estuaries and wetlands
10. simplify monitoring, evaluation and reporting.

Section I:
Concept of the IMF

Chapter 1:
Background and Context of the IMF

1.1 Introduction

The IMF was developed within the GEF MAP/UNEP MedPartnership project. The three partners engaged in the preparation of integrated management plans for the protection and sustainable use of coastal areas and their surface and groundwater resources, with the final aim of securing the health of the Mediterranean Sea and of its coastal waters and ecosystems, felt the need to combine different applied approaches and to deliver a truly integrated plan. During the drafting of the IMF it became clear that a truly integrated approach required the review, selection and incorporation of all major relevant concepts and management approaches in order to offer the reader and user of this document not only a "panorama" of management options but the sources of key "ingredients" needed in integrated management.

With activities in the same project area (Buna/Bojana) the three partners had the challenging opportunity for a hands-on test of a jointly prepared local integrated plan. Within the MedPartnership project, PAP/RAC was to prepare an ICZM plan for the transboundary area of the Buna/Bojana river and delta shared between Albania and Montenegro; GWP-Med was to prepare an IWRM plan for the same area; and UNESCO-IHP was to introduce, for the first time, consideration of coastal aquifers within the context of ICZM and of marine protection. The resulting task was to attempt a joint development of an integrated plan that would fulfil all the three initial objectives in the Buna/Bojana river and delta area (see Box 1.1).

In addition, PAP/RAC developed an ICZM plan for the Reghaia coastal zone in Algeria where UNESCO-IHP contributed the elements for the aquifer management scheme. Furthermore, within MedPartnership, GWP-Med has launched replication of integrated planning activities in the Awali River basin and coastal zone, in Lebanon.

The increasing complexity and interdependency existing within the coastal zone, exacerbated by climate change and combined with limited (if not decreasing) human and financial resources of responsible regulatory and monitoring bodies and administrations, call for fully integrated approaches to go beyond what is expected by "ordinary coherence" among individual plans. A well-conceived and comprehensive approach could support administrations and indeed communities, businesses and the country as a whole by designing, drafting and implementing coastal management plans that aim to foster SD and provide an effective collective response to national, regional and international legal obligations (Figure 1.1).

Crucial to the proper design and implementation of all the aforementioned plans and common to all methodologies proposed are the EcAp and the participatory approach. Although there could be a range of related specific plans, for any level they may address (national, subnational, local, transboundary), they still have the same ultimate goal; thus overlap in some parts is expected. Climate change, a cross-cutting issue of high importance to the coastal and aquatic systems, also needs to be properly addressed and integrated. The multiplicity, complexity and interconnectedness of all these issues make it apparent why the coastal zone can be successfully planned and managed only in a genuinely holistic and integrated way. This requires knowledge and skills to be shown by planners, implementers and the range of partners involved.

Box 1.1. The MedPartnership project

The GEF UNEP/MAP Strategic Partnership for the Mediterranean Large Marine Ecosystem (MedPartnership) aims to reverse the degradation trends affecting the Mediterranean's unique large marine ecosystem, including its coastal habitats and biodiversity. Within this project some of the biggest organizations working in the field of sustainable development in the Mediterranean – including UNEP/MAP, GEF/World Bank (WB), EU and all partner countries – joined forces and, through a coordinated and strategic approach, are striving to catalyse the policy, legal and institutional reforms along with investments. The project was launched in 2009 and it is to be finalized by the end of 2015.

The MedPartnership project is composed of four components:

- Integrated approaches for the implementation of strategic action plans (SAPs) and NAPs: ICZM, IWRM and management of coastal aquifers.
- Pollution from land-based activities: implementation of the Strategic Action Plan for the Mediterranean (SAP-MED) and related NAPs.
- Conservation of Biological Diversity: implementation of the Strategic Action Plan for Biodiversity (SAP-BIO) and related NAPs.
- Project coordination, communication and replication strategies, monitoring and evaluation.

ICZM is a part of MedPartnership's Component 1. Besides PAP/RAC, integrated approaches are the topic for two more partners: Global Water Partnership – Mediterranean (GWP-Med), dealing with IWRM and UNESCO-IHP, dealing with coastal aquifer and groundwater management.

More information at www.themedpartnership.org

EcAp is... "a strategy for the integrated management of land, water and living resources that *promotes conservation and sustainable use* in an equitable way".

Convention of Biological Diversity

EcAp is... "a strategy for the integrated management of land, water and living resources that *provides sustainable delivery of ecosystem services* in an equitable way".

UNEP Ecosystem Management Programme

The participatory approach is a quality of an approach to enable and facilitate involvement of the public in the process of identifying problems and to secure taking into consideration their opinions when deciding on priorities and proposing solutions.

Participatory actions are considered those where at least one of the partners is a civil society stakeholder, such as NGO, local authority, private sector. Participatory actions are inseparably linked with information and could be either "vertical", involving interaction with administration and authorities or "horizontal" among partners.

(Scoullos *et al.*, 2002).

An integrated plan, as presented in this publication, should be considered as a framework which could provide an adaptive, operational, "doable" ("down-to-earth") plan into which other components could also be integrated. It is important to view this exercise, which includes a series of key steps (the sequence and duration of which are governed by local conditions and priorities), as a continuum. In doing so, it is recognized that genuinely similar or even identical conditions are frequently described, clustered or subdivided – artificially and conventionally – in ways that inhibit integration. Therefore, important starting points for this process are the proper understanding of the meaning of integration and a fair assessment and utilization of all relevant information, including eventually pre-existing plans and management approaches, whether applied or proposed.

The intellectual inputs included in the IMF have been considered from two viewpoints:

1. the actual value of the information, based on its importance, quality and relevance
2. the contribution (potential "value added") to the deepening and consolidation of the integrated approach.

In integrating methodologies, the ultimate goal is a meaningful solution-oriented synthesis. It might be useful from the legal/institutional point of view, but of lesser importance from a scientific and operational point of view, to accurately define what was actually the background or origin of plans and strategies and what are the new elements to be added or integrated. This is because ICZM, IWRM, and coastal aquifer and groundwater management have – as common guiding principles – the elaboration and implementation of coherent and comprehensive SD solutions. If any of these are properly prepared and in place then they should provide, by definition, a genuinely open background to welcome compatible contributions on related subsystems or processes from all relevant disciplines, sectors and stakeholders. In this respect, one may go even beyond ICZM, IWRM and coastal aquifer and groundwater management in integrating additional management requirements such as physical or spatial planning (including MSP) to the extent that this is feasible and useful.

This observation is of particular relevance for the Mediterranean, where many countries have already prepared, or are in the process of elaborating and implementing, Integrated River Basin Management (IRBM) plans through the provisions of the WFD. This applies to the EU Mediterranean countries through legally binding procedures and to a number of non-EU Mediterranean countries (e.g. those in the EU accession process) on a voluntary basis. Similarly, all Mediterranean countries that are Parties to the Barcelona Convention have to elaborate and implement ICZM plans according to the ICZM Protocol to the Convention, and apparently many countries already have sets of relevant provisions in place. In addition, all parties concerned have subscribed to the principles of SD and have agreed to prepare appropriate plans for its achievement. They have also made a commitment to implement the EcAp, initially introduced by the Convention on Biological Diversity, and have also gradually developed within the Barcelona Convention System through the EcAp process. Finally, all countries have to elaborate national climate adaptation plans, a major focus of which is on waters and coastal areas.

In such a landscape, only joint work, cooperation and/or consultation could secure the dependable plan of activities and measures that is necessary for SD of coastal zones, and facilitate the rationalization of the overall process of plan preparation and reflection of (and integration and/or harmonization with) the wider natural and socioeconomic environment and related plans, for example at the national level.

The level of cooperation and its performance will depend on the openness and level of maturity of pre-existing or new plans (ICZM, IWRM, coastal aquifer and groundwater). Various situation scenarios are possible: ICZM is in preparation and IWRM has been prepared; ICZM is in preparation and IWRM is not; or both ICZM and IWRM are being developed simultaneously. Coastal aquifer and groundwater management have barely been implemented

anywhere yet, while in many cases economic development, climate change adaptation, risk management and other specific plans may exist or are also in preparation. The present document and the methodology elaborated in it can be applied to any of the previously mentioned scenarios. The goals and the procedure to be followed are the same, while the activities will differ in order to achieve the required level of integration. The activities create, as far as possible, the data and information base necessary for the harmonized implementation of the existing plans. As such plans need to be revised at certain intervals, it is both feasible and convenient to harmonize the individual integrated plans, including coastal aquifer and groundwater management, on those occasions.

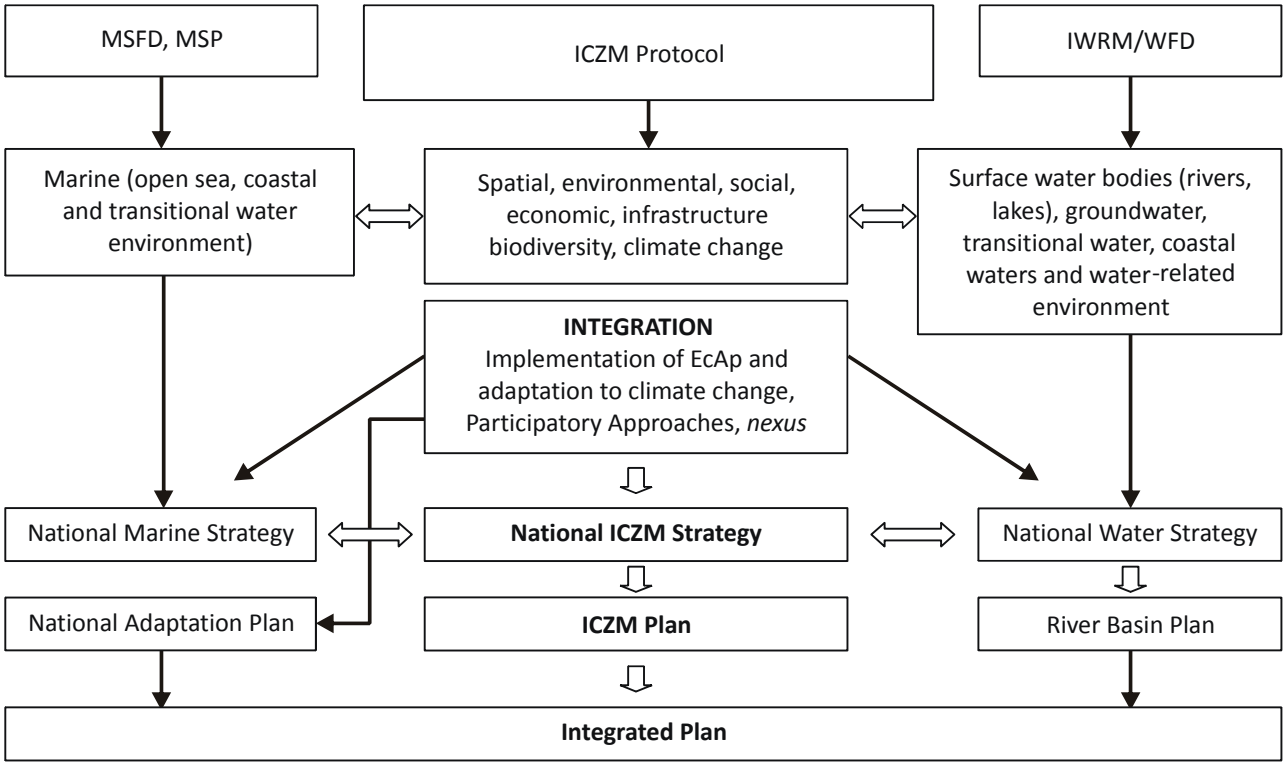


Figure 1.1. Coastal zone-relevant international legislation and resulting obligations

1.2. Synergy with other activities

This document is a major contribution of the Global Environmental Facility (GEF) supported MedPartnership project. It has been designed to respond to the need to implementation of the ICZM Protocol, and also of IWRM and coastal aquifer and groundwater management, as well as to facilitate the EcAp, adaptation to climate change and, whenever appropriate, WFD, MSFD, Horizon 2020 and a future strategy for water in the Mediterranean.

IMF is tested in three plans in the framework of the MedPartnership project: The Buna/Bojana Transboundary Integrated Management Plan, the ICZM plan in Reghaia, Algeria, and the ICZM/IWRM plan in Awali River and coastal area, Lebanon. In addition, the process presented in section II is used within the EU 7th Framework Programme (FP7) project People for Ecosystem-based Governance in Assessing Sustainable Development of Ocean and Coast (PEGASO). It was also utilized for training within the EU Sustainable Water Integrated Management-Support Mechanism (SWIM-SM) project. Finally, an EU MED EUWI project (a Mediterranean component of the EU Water Initiative) contributed to the testing of this document through its activities related to the IWRM component of the Buna/Bojana area plan. Valuable feedback from all these activities is included in the proposed IMF (Figure 1.2).

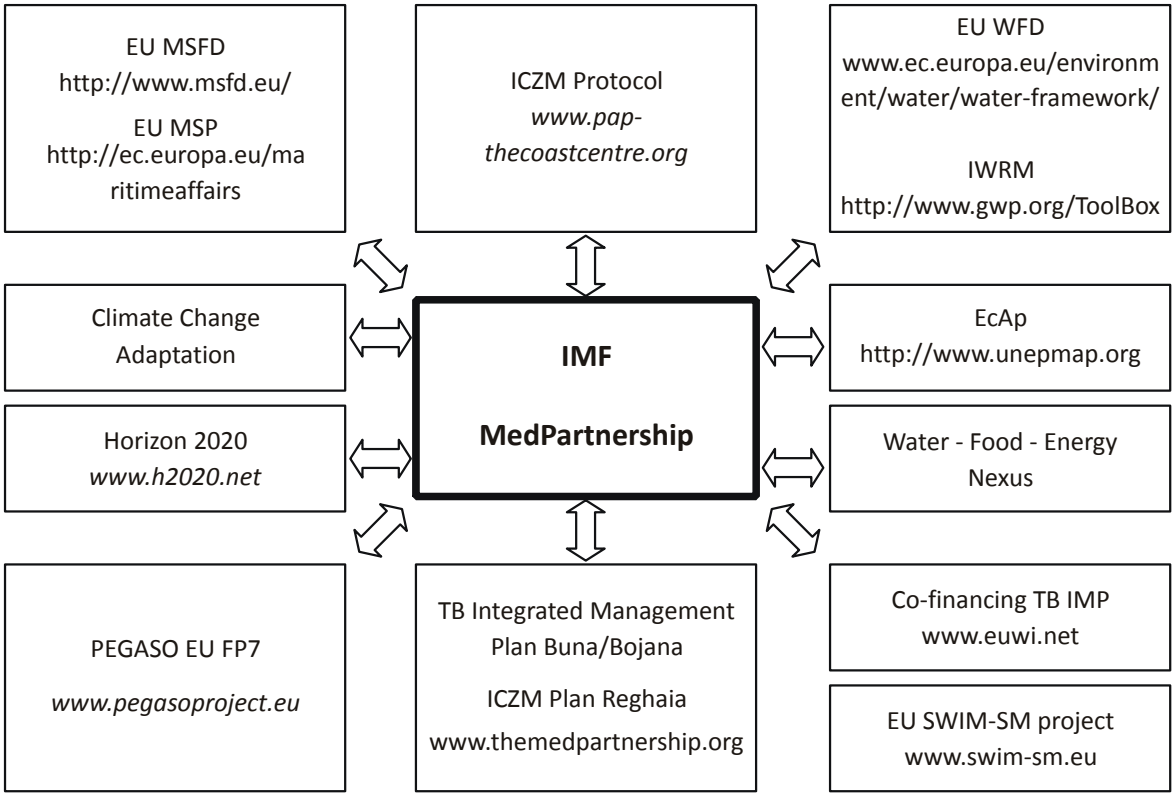


Figure 1.2. Synergies created

1.3 Towards convergence: why "integrate" the "integrated" plans?

The tendency to develop "integrated" management has its roots in the so-called "holistic" approaches of the 1970s (see 2.3) and reached its peak with the introduction and promotion of the integrated approach within water resources management and coastal zone management in the 1990s and beyond (Figure 1.3). The need to introduce an integrated approach was a consequence of the increased conflicts over limited resources that are progressively more scarce compared to the demand. Integration was proposed in the first place as a solution to fragmentation at various governance levels; competing uses of natural resources and sectoral approaches; followed by the lack of coherence in policies, strategies and approaches related to the environment and development. Such incoherence often results in contradictory measures and reduced efficiency of proposed solutions while delaying and increasing the cost of their implementation.

The need to combine integrated approaches has become evident and recognized at various expert meetings and international forums. For instance, in the 5th World Water Forum (WWF) in Istanbul in 2009 it was concluded that the enhancement of synergies between IWRM and ICZM was among the key political priorities for the Mediterranean, together with sustainable financing of the water sector and adoption of adaptation measures to address climate change. It was also suggested that tourism and agriculture were the most important sectors, frequently in competition with each other in the region, where the management of water and coastal zones needed to be integrated. Similarly, the expansion of desalination and the use of treated wastewaters in agriculture and elsewhere are key features to be considered by both ICZM and IWRM, and obviously the solutions to be adopted need, after all, to be compatible if not identical.

Furthermore, in most Mediterranean countries, a significant percentage of the population; industrial installations including those for tourism; important infrastructures (highways, airports, ports, etc.); and agriculture are located within the coastal zone. In this zone the water demand is very high and rapidly increasing, leading to heavily exploited and damaged aquifers, sea intrusion and deterioration of associated aquatic and terrestrial ecosystems. The pollution loads carried by rivers or generated by the wastewater discharges from urban and industrial sources are still some of the most important contributors to the pollution of the Mediterranean Sea. It has been estimated that 80 per cent of the pollution received by the Mediterranean is generated by three categories of point sources located in the coastal zone: wastewater, municipal solid wastes and industrial pollution (source: Horizon 2020, www.h2020.net/the-h2020- initiative.html). Therefore, efficient measures cannot be designed, agreed upon and implemented unless coordinated management of water and land resources and their uses is done in synergy within the physical and "institutional" space of the coastal zone, including its marine part. To achieve this, useful methods and experiences developed and/or tested by a series of organizations, programmes and projects are to be considered and, when appropriate, used in a comprehensive way. Finally, the means (institutional, human, financial, etc.) for promoting and implementing ICZM and IWRM are in most cases common, even when some differences may occur in some specific methodologies followed.

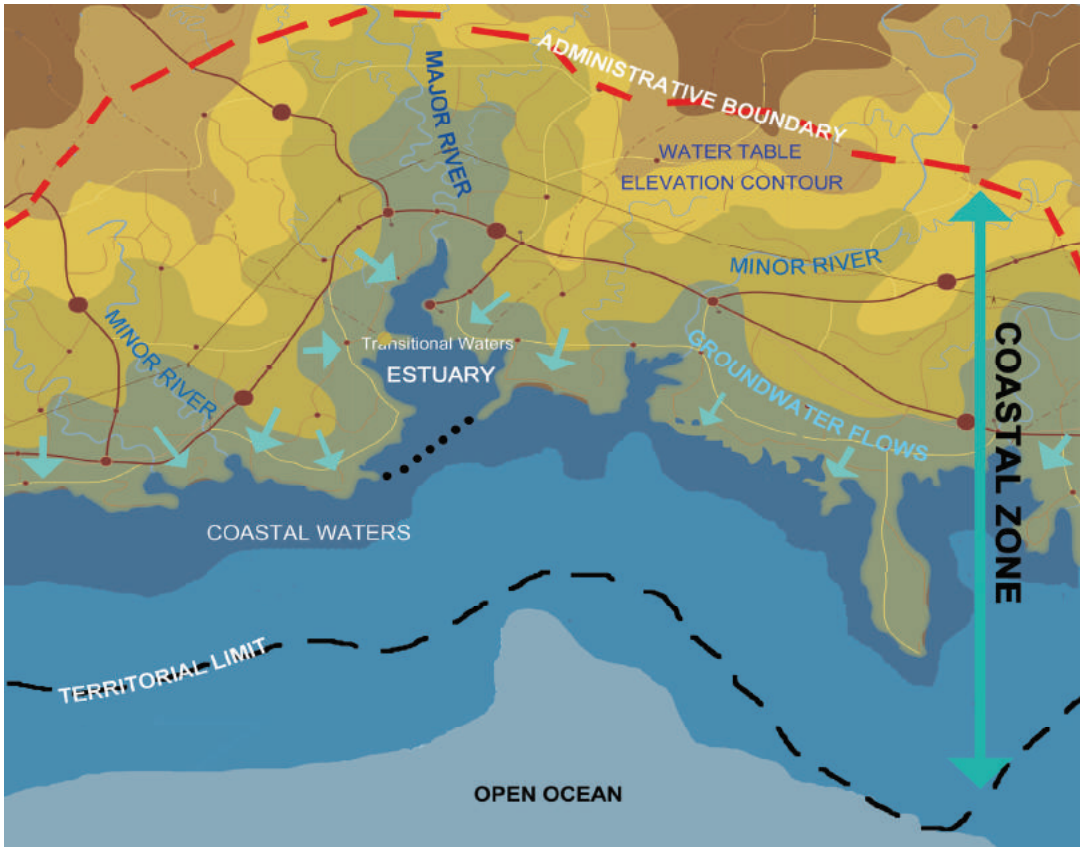


Figure 1.3. The coastal zone showing the ICZM Protocol boundaries, groundwaters and WFD waters (B. Shipman)

1.4 Coastal management and planning

Coastal management started to develop in the second part of the twentieth century, mainly since the 1970s, as a subsystem of both physical planning and of environmental planning and management. During the first few decades there was a lot of discussion about the proper terminology and the rather small variations or nuances of the concept behind the various suggestions, such as ICZM; Integrated Coastal Management (ICM); Integrated Coastal Area Management (ICAM); and Integrated Coastal and Marine Management (ICMM), each having pros and cons.

The Mediterranean ICZM Protocol defines ICZM as "a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts" (UNEP/MAP/PAP, 2008).

The ICZM Protocol requires countries to:

"further strengthen or formulate a national strategy for ICZM and coastal implementation plans and programmes … in conformity with the integrated management objectives and principles … Coastal plans and programmes, which may be self-standing or integrated in other plans and programmes, shall specify the orientations of the national strategy and implement it at an appropriate territorial level, determining, inter alia and where appropriate, the carrying capacities and conditions for the allocation and use of the respective marine and land parts of coastal zones".

Although in this paragraph water (fresh water, surface water and/or groundwater) is not explicitly mentioned, it was implicitly considered as part of the land component (natural environment), since water is the "existence resource" for humans and the environment. Furthermore, in article 9.1.C, the ICZM Protocol clearly refers to the need to combine ICZM with IWRM.

The ICZM plan refers primarily to the activities and measures aimed at establishing and making operational an optimal governance framework to lead society towards sustainable coastal development. This will be its main objective and task, for instance, in cases where a physical plan or a development plan already exists and needs to be complemented by a management and governance mechanism which could ensure that ICZM principles are embedded and respected and that integration is achieved in all its forms. In other cases, the objective of the ICZM plan may be more complex, meaning that it will have a double aim: (1) shaping the development and management objectives and options; and (2) designing the processes needed to deliver them.

During the preparation of the ICZM Protocol, the terms "ICZM plans" and "coastal plans" were both used. The term coastal plans is still in use in the legislation of some Mediterranean countries. The coastal plan was initially considered to be closer to a conventional physical development plan, primarily concerned with land uses.

The objectives and function of ICZM planning may be more easily understood by examining it in conjunction with "spatial planning", since the two are closely related. There are various types of spatial plans. Some may provide a general framework for the entire country, while others refer to specific areas or sectors. In Greece, for instance, parliament adopted the "General Framework for Spatial Planning and Sustainable Development", followed by a set of Specific Planning Frameworks (e.g. for "Coastal Areas" or specific sectoral activities such as tourism, aquaculture and industry). These plans provide objectives, principles and rules, which are not site-specific. "Regional frameworks for spatial planning and SD" specify, at the level of each region, the directions of the general framework. In addition to the above, national legislation (which quite often implements international conventions) introduces specific provisions that are also to be taken into account. For instance, in Greece, one important tool at local scale is provided by Urban Planning Law 2508/1997,

which allows the designation of coastal or riverine areas not intended for residential development but for specific uses or functions, such as natural habitats or sites of high aesthetic value, such as forests and woodlands. The ICZM for a specific area needs to take all the above into account and provide recommendations for implementation. In some cases, there are site-specific spatial plans which may define a desirable picture of the given space in a given time-horizon. In this case, an ICZM plan could be defined as a plan of more concrete actions and measures enabling the above picture to be realized. It might be said that an ICZM plan adds dynamism to the often rather static vision of a spatial plan.

Spatial planners develop the desirable picture of the space based on its assessed values, preserving naturally valuable zones and proposing less valuable ones for development; they also propose the necessary infrastructure. However, taking into account the dynamism of modern society and global uncertainties such as climate change or financial crises, coupled with the real strength of private capital, an ICZM plan needs to support the spatial plan both by adding elements that will help in reaching sustainability and by serving as a monitor of the process. The latter is to be carried out by verifying whether the objectives and principles of the ICZM have been respected: articles 5 (see Box 1.2) and 6 (see Box 4.1) of the ICZM Protocol.

Box 1.2. Article 5 of the ICZM Protocol: Objectives of ICZM

The objectives of ICZM are to:

1. facilitate, through the rational planning of activities, the SD of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development
2. preserve coastal zones for the benefit of current and future generations
3. ensure the sustainable use of natural resources, particularly with regard to water use
4. ensure preservation of the integrity of coastal ecosystems, landscapes and geomorphology
5. prevent and/or reduce the effects of natural hazards and in particular of climate change, which can be induced by natural or human activities
6. achieve coherence between public and private initiatives and between all decisions by the public authorities that affect the use of the coastal zone at national, regional and local levels.

The ICZM plan is strongly focused on the process needed to reach the desirable outcome proposed by the spatial plan. An ICZM plan should, therefore, provide recommendations for the institutional, legal and management aspects for the implementation of the spatial plan. It should also address the remaining components of the governance framework needed for achieving sustainability, which are frequently underdeveloped in a spatial plan, such as use of technology and science, information/awareness/ education and different dimensions of culture. Finally, an ICZM plan should provide recommendations not only for the policies and strategies to be followed but also for the instruments and measures to be applied for environmental assessment, including monitoring and evaluation; land policy; and economic, financial and fiscal tools. Such a plan must be developed through, and reflect, a holistic approach; therefore it should not be biased by one “pillar” of SD led by the interests, objectives or assumptions of a single sector, of a part of some sector (e.g. tourism) or, for example, only by environmental protection. It is important to remember that an ICZM plan is not a substitute for a spatial plan, but a complement to it.

A very important element for the success of an ICZM plan is its ownership. This is why one of the key ICZM principles is the application of a participatory approach, which provides the answer to the question: Who are those who could enable the vision of sustainability to become a reality?

Surely, it is not the government alone. In reaching sustainability everyone has a role; therefore, the ICZM plan deals to a large extent with governance mechanisms that obtain on one hand the maximum consensus and on the other enable changes to be made on the course towards sustainability.

ICZM plans have in fact been produced all over the world, in the vast majority of cases as self-standing management documents, being the highlights of ICZM processes. Their content varies widely according to local conditions. However, a common feature of them all is that they address a wide range of interrelated coastal issues and adequately cover social, economic and environmental aspects.

1.5 IWRM, river basin management and planning

River Basin Management (RBM) and planning includes development and management of water resources for various uses taking into account the needs, priorities and aspirations of different users and stakeholders within a specific river basin. The combination of the above identifies the scale of the ambition of such intervention.

IWRM, according to the widely accepted Global Water Partnership (GWP) definition (GWP, 2000), is a process that promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment. To obtain such management, sound scientific information and knowledge management is required, while key to its successful implementation is the active participation of all stakeholders in creating and maintaining economically and socially just and viable institutions and mechanisms to manage water resources. IWRM initially focused on water (re)allocation across sectors and rational use, as mentioned above, but traditionally IWRM has also focused on reduction of consumption (water demand management) in each sector, combining and (if possible) balancing supply and demand. In this respect, water economy and eventual reforms in agriculture (the most water demanding sector in the Mediterranean region) could allow for transfer of water resources to other competitive sectors, such as tourism, allowing their further development. IWRM has developed to include a number of objectives, such as securing water supply, rationalizing water demand, preventing and reducing pollution, promoting sustainable usage of aquatic resources, contributing to overall environmental protection, improving aquatic ecosystems and mitigating the effects of floods and droughts. In this respect both groundwaters and urban waters management are understood as integral components of IWRM though both of them have developed in various parts of the world elaborated methodologies and practices for what is frequently referred to as Integrated Groundwater Management (IGWM) and Integrated Urban Water Management (IUWM).

As a consequence of the combination of RBM and IWRM, the concept of IRBM emerged as a "process of coordinating conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximize the economic and social benefits derived from water resources in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems." (GWP, 2000).

In the EU, the WFD offers an ambitious and concrete framework for such an integrated water management approach with emphasis on river basins. The process consists of several major steps including:

- assessment of the situation, trends, needs and legal obligations (including through other EU-related directives)
- identification of the desired situation (“general environmental objective of good status which means both good ecological status and good chemical status” of all waters including transitional and coastal waters) (http://ec.europa.eu/environment/water/water-framework/objectives/status_en.htm) (towards a “vision” for water resources management)

- formulation of interventions and measures to arrive at the desired situation
- establishment of a monitoring system to keep track of results of interventions towards the achievement of water resources management goals.

The proper assessment of the situation and needs requires a good understanding of a series of parameters such as the physical conditions of the system in question; the competent stakeholders and their relationships; the current problems and eventually their root causes as well as the envisaged solutions. It also includes a review of the impacts of human activities on water; economic analysis of water use; a register of areas that require special protection; and a survey of all adjacent bodies of water used in the basin for abstracting water for human consumption.

According to the WFD, the management plans aim to prevent deterioration, enhance and restore bodies of all waters, achieve good chemical and ecological status, reduce pollution discharges and emission of hazardous substances and preserve protected areas.

The established framework also has to contribute to mitigation of the effects of floods and droughts. The RBM plan has to balance available water resources and demand, thus avoiding long-term water scarcity, and provide clear links to the management of flood risk in catchments, which is specially addressed through requirements in the EU Floods Directive. WFD requires EU Member States to clearly demonstrate how climate change projections have been considered in the assessment of pressures and impacts, monitoring programmes and appraisal of measures.

IRBM plans may eventually be complemented by more detailed management programmes and plans for sub-basins (e.g. coastal water resources), particular types of water (e.g. coastal aquifers), specific water bodies (estuaries, wetlands, etc.) or particular water uses (e.g. for irrigation/ agriculture). It is expected that specific attention to interconnectiveness of subsystems as integral parts of the overall river basin system will become even more important in the future due to the already visible impacts of climate change. This is obviously the case in wetlands, coastal aquifers and estuaries, and these areas will be discussed further in the following chapters.

Box 1.3 focuses on agriculture to demonstrate the relationship and synergy needed from IWRM and ICZM in dealing with this sector.

Wetlands include a wide variety of habitats such as marshes, peatlands, floodplains, rivers and lakes, and coastal areas such as saltmarshes, mangroves, and seagrass beds, but also coral reefs and other marine areas no deeper than six meters at low tide, as well as human-made wetlands such as waste-water treatment ponds and reservoirs.

Ramsar Convention

Although the management of wetlands has a long history and accumulated expertize on its own, it is guided by both ICZM and IWRM principles and practices and contributes to their effective combination on the ground.

Box 1.3. Examples of agricultural considerations within IWRM and ICZM

Irrigated agriculture is one of the most important sectors in the Mediterranean, where impressive results could be expected with regards to increasing yields, as has been already observed in some countries where sustainable practices are applied through a combination of technical and economic tools. In other cases documented in the region, the potable water used for irrigation has been reduced substantially, by almost 50 per cent, and substituted by safe treated wastewater. It is also important to remember that 1 m^3 of water utilized in high-value activities could be counted as 1.5-1.7 m^3 as a consequence of reuse (treated wastewater for irrigation, etc.). To obtain such a shift in use and reuse of water, or change in cropping patterns, technical and regulatory regimes need to be mobilized in synergies between IWRM and ICZM. What is clear from the above examples is that the opportunities and alternatives deriving from IWRM, including decisions for reallocation of water from agriculture to other sectors (e.g. tourism), could be significantly enhanced and differentiate the options for development in coastal areas.

Another alternative within the IWRM spectrum of measures is to reduce the amount of high-value potable water designated to watering low-value crops. It can be achieved by modifying cropping patterns and by challenging tariff thresholds, for example by shifting bananas or other water-demanding cultivations in the Mediterranean (12,000m^3/hectare (ha)) to tomatoes and vegetables requiring only half the amount of water. Also, recent research claims there are significant economic gains to be made from shifting away from irrigated, low-profitability cultivations to high-value herbs, aromatic and medical plants, which require less water. There is also room for improvement of non-irrigated forage rather than increasing irrigated crops; and another option is the introduction of the so-called "regulated deficit irrigation" ensuring that trees are only watered at critical times during the fruit-production life cycle.

1.6 Coastal aquifer and groundwater management and planning

The hydrogeology of coastal zones is characterized by the layering of fresh water over the more dense saline waters of the sea. The position of the interface may vary naturally according to climate (amount of rainfall). Over-exploitation of the more superficial coastal aquifers may result in saline water intrusion in the aquifer, a process that is observed not only throughout the Mediterranean but in all populated coastal areas of the world (Figure 1.4). Seawater intrusion, being reversible in a limited number of cases, leads to the progressive loss of coastal aquifers. This is a problem acquiring global dimensions, endangering the development of many highly populated coastal regions. The problem will, of course, be aggravated by climate change and sea-level rise. No simple solution exists, other than comprehensive water management regimes embracing entire watersheds, including constant monitoring of the saline wedge, and artificial recharge of the coastal aquifers with flood waters or with properly treated grey water.

In coastal areas, aquifers are inextricably interlinked with surface water. In this respect it is evident that aquifers are part of overall hydrological systems and therefore integral parts of IWRM. However, either because of historic and practical reasons or because of their "invisible" nature and linkage to sometimes complex geological settings and processes, they are frequently neglected, despite their capital importance. This is why in the current IMF approach special emphasis is given to their management. The goals of coastal aquifer management and planning are to protect, enhance and – to the extent possible – restore the status of all bodies of coastal groundwater, prevent their pollution and deterioration, ensure a balance between groundwater abstraction and replenishment, and reduce seawater intrusion processes. Groundwater is frequently a water resource extensively abstracted for domestic and industrial uses but mostly for irrigated agriculture.

The groundwater footprint of towns and cities increases directly with increasing population density until a threshold is reached beyond which cities are obliged to source water from distant reservoirs and aquifers. However, agriculture is by far the largest user of groundwater and, as towns and cities grow, agriculture will be expected to release groundwater for servicing urban demand and other high-value uses (Shah, 2014). In Spain, between 1960 and 2000 annual groundwater use increased from 2 km^3 to 6 km^3 before it stabilized (Hernández-Mora *et al.*, 2003). In Spain, and in North African countries such as Morocco and Tunisia, total groundwater use peaked during the 1980s.

The focus of aquifer management in coastal zones is on reaching a balance between protection of ecosystem services – considering that many land, freshwater and marine ecosystems are groundwater-dependent – and the sustainability of the often aggressive socioeconomic development of the coastal zones impacted by emerging local as well as global (climatic) changes. It is a challenging task since coastal groundwater is vulnerable to impacts from land use, upstream pollution, marine water intrusion and complex coastal geological processes.

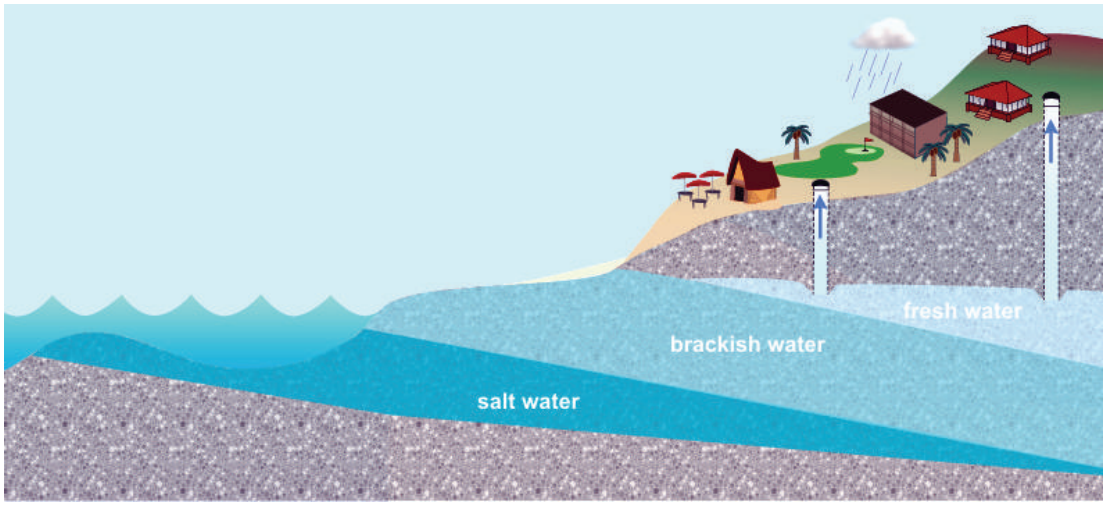


Figure 1.4. Coastal aquifers

Assessment of the intrinsic vulnerability of coastal aquifers to contamination both vertically (from anthropogenic activities on the land surface: agricultural practices, waste disposal, etc.) and horizontally (seawater intrusion) is one of the main management tools, together with monitoring, for ensuring the protection of the highly valuable fresh water of coastal aquifers which is often the main source of drinking water. Coastal aquifer vulnerability depends on the lithological characteristics of the subsurface (mostly its permeability distribution) and on morphology of the terrains. Vulnerability maps, if coupled with analysis of existing and potential future land uses (the various potential human activities likely to occur in the coastal zone) will allow definition of critical parameters of the carrying capacity/coastal zone use capability.

A recent GWP TEC background paper (Shah, 2014) has thoroughly examined the impact of irrigated agriculture on groundwater, analysing the above-mentioned factors in conjunction with groundwater governance.

Of the four recognizable groundwater socioecologies identified (arid agrarian systems, industrial agricultural systems, smallholder intensive farming systems and groundwater-supported extensive agro-pastoralism), the first two are particularly important for the Mediterranean. These differ in hydroclimatic and demographic characteristics, land-use patterns, organization of agriculture and

the relative importance of irrigated and rain-fed farming. Also different are the drivers of growth and the nature and level of the stake of these societies in their groundwater-irrigated agriculture.

In the arid Middle East and North Africa (MENA), water scarcity is the key driver of groundwater irrigation. The challenge here is striking a balance between present versus future needs and irrigation versus urban uses of what is mostly non-renewable groundwater. In industrialized countries such as Italy, Spain and Greece (Crete) groundwater in some areas suffers from depletion as well as pollution from agriculture, but it supports high-value export agriculture. These countries bring together vast financial and scientific resources and institutional capacities to agricultural groundwater management; as a result, it is here that much of today's scientific and institutional knowledge base for groundwater management has evolved and been tested.

All these regions face governance challenges, particularly in achieving sustainable use of aquifers, because groundwater irrigation is economically very important (see Box 1.4). The issue of appropriate management of irrigated agriculture and especially that of using groundwater is therefore one of the most difficult to address in the context of IMF because, in some cases (e.g. Morocco and Spain), groundwater-value productivity is high and groundwater irrigation continues because it has a large impact on commercial farming incomes and on agricultural exports. In other cases (such as Jordan) groundwater is often the only source of irrigation. In this way the "vicious circle" or groundwater intensification continues.

Box 1.4. Groundwater irrigation economy in the Mediterranean (Shah, 2014)

The value added to farming from groundwater use is best demonstrated in the Mediterranean region. In Andalusia, Spain, groundwater users applied less water per hectare compared to surfacewater irrigators – 3900 m^3 versus 5000 m^3. They achieved higher gross water productivity – US dollars (US$)3.24/$m^3$ versus US$0.97, and increased farm output value per cubic metre (m^3) of water – US$9.94 versus US$4.6 (Hernandez-Mora *et al*., 2010).

Another study in Spain in 2006 claimed that groundwater productivity can be as high as US$5.52/$m^3$ for peppers and tomatoes compared to US$0.28/$m^3$ for field crops such as corn, sunflower and cereals (Garrido *et al*., 2006). Labour can be 300 man-days/ha for groundwater-irrigated export crops and the gross value of the output as high as US$55,000/ha for irrigated strawberries and citrus. Many Spanish glasshouse growers generate upwards of US$95,000/ha from groundwater-irrigated tomato production (Ramon Llamas, personal communication).

In 2008, farmers in the Jordan River valley earned net revenues from groundwater-irrigated farming of up to US$14,000-US$16,000/ha (Molle *et al*., 2008). In Morocco, the area irrigated by groundwater is just over one-third of the area under irrigation, but it contributes nearly 75 per cent of the country's exports of high-value orchard and vegetable crops. These are shipped mostly to the EU and account for more than one-half of the total value added from all sources of irrigation (FAO, 2009). However, 80 per cent of Morocco's vegetable and fruit production comes from areas where groundwater levels are falling by 2–3 m annually (Ait Kadi, personal communication, 2013).

Higher economic productivity of groundwater in agriculture readily converts into greater market valuation of groundwater-irrigated land. During the early 1970s farmers in the United States of America found that access to groundwater irrigation increased the value of land from US$187/ha to US$415-US$427/ha (Lee and Bagley, 1973). In Spain, access to groundwater rights multiplies the value of land by a factor of 1.5 for vineyards and by a factor of 2 for olive trees, representing an implicit groundwater value of US$2.8-US$5.5/m^3 (Garrido *et al*., 2006). An earlier study claimed that Spain needed 50,000 m^3 of surface water to create a farm job in rice or cotton, but only 5000m^3 of groundwater to do so in greenhouse agriculture for export.

Understanding the economic dynamic is critical to success in eliciting farmer participation in the sustainable management of water and of aquifers in particular. Management based on technical interventions that fail to factor in this dynamic will have little chance of success. Where there is intensive farming by smallholders these impacts are the norm and may cover large parts of coastal areas. The most common outcome is alluvial and hard-rock aquifer depletion and falling groundwater levels. This causes shallow wells to run dry; users who share the same aquifer must compete in deepening their tube wells, interfering with each other if they are close together, while pumping costs increase. As groundwater levels fall, there is evidence of large-scale impact as wetlands dry out, river and stream flows decline and secondary salinization occurs. In some cases, this increases concentrations of geogenic contaminants such as fluoride, arsenic (not so common in the Mediterranean region) and nitrates in groundwater which some people still use, untreated, as drinking water (Shah, 2014).

1.7 Climate change and variability considerations and management plans

Coastal zones adjacent to a river are areas where climate change and variability impacts deriving from the river basin are combined with those from the sea, making them extremely vulnerable. In addition, being rich in natural resources and densely populated with many socioeconomic activities, they are also fully exposed to secondary impacts of climate change. For that reason the topic of climate change and variability is of great importance for the elaboration of truly integrated plans.

Changes in climate that are already occurring and which are expected in future will impact on coastal areas and aquatic systems in many ways: with floods, droughts, accelerated erosion and desertification; salinization of coastal aquifers, wetlands, estuaries and the soil; decrease in soil moisture; higher frequency of forest fires; and a series of other phenomena directly and/or indirectly related to changes in biodiversity, health, agricultural production, tourism, etc. An increase in sea temperature and acidity is expected to accelerate and alter biogeochemical processes in the aquatic environment with potential impact also on the quality and productivity of coastal marine waters.

Sea-level rise, combined with storm surges and other extreme weather events, may cause flooding of the coastal lands with negative impact on the environment, infrastructure and buildings in the coastal zone. Sea-level rise will also impact on the coastal aquifers, particularly on the freshwater and seawater interface, and further decrease the capacity of coastal aquifers. It may also affect the hydrological situation of upstream waters and increase the risk of flooding and the negative effects of high groundwater. Therefore, coastal aquatic systems – and particularly aquifers and wetlands – need due attention and should be studied and analysed in greater detail than in the past. Their exploitation should be carefully planned and managed as specific water bodies within the overall coastal water resources system.

Many of the above-mentioned issues have been identified as of high priority and urgency in the past two to three decades. This has led to a series of proposals, recommendations and decisions in the framework of various conventions and international organizations for the introduction of specific types of management. The most important, widely known and frequently used management plans that are directly relevant to the integrated planning of water resources and/or coastal areas are now briefly examined.

The United Nations Framework Convention on Climate Change (UNFCCC) has established the National Adaptation Plan process as a way to facilitate adaptation planning, initially in least developed (LD) and developing countries (UNFCCC, 2012). The agreed objectives of the National Adaptation Plan process are to reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; and to facilitate

the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes, plans and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate (UNFCCC, 2011).

UNFCCC led a series of Adaptation to Climate Change Plans and Programmes during the last decade. These plans vary significantly in their content and emphasis on the measures to be considered including different technological and socioeconomic "menus". In many cases the data needed or difficulties in downscaling climate change models lead to a particular emphasis to be placed on "no-regret measures", the majority of which are common under regular IWRM.

"No-regret'' measures are such measures that produce benefits even in the absence of climate change.

The European Commission (EC) White Paper "Adapting to Climate Change; Towards a European Framework for Action" (COM/2009/147) calls for a more strategic approach to climate change adaptation across different sectors and levels of governance, and for guidance to integrate climate change adaptation into implementation of the EU water policy, including WFD and river basin plans. In such a way the idea of adaptation to climate change planning is widely recognized.

The UNEP MAP, by implementing the sister project to the MedPartnership initiative (i.e. the GEF project "Integration of climatic variability and change into national strategies to implement the ICZM Protocol in the Mediterranean") is introducing and integrating climate variability and change measures into ICZM plans. A practical example is the Šibenik-Knin County ICZM plan led by PAP/RAC that will contribute to the regional framework of MAP for climate change adaptation.

Although conceptually parts of the Adaptation to Climate Change Management Planning, specific Integrated Flood Management (IFM) and Integrated Drought Management (IDM) plans have been proposed (e.g. World Meteorological Organization (WMO), GWP) and promoted in various parts of the world. This is because of the frequently very large-scale and severe impacts of these phenomena on populations and the economy, particularly on livelihoods, households, agriculture and infrastructures. Two- or even three-dimensional (2D or 3D) modelling of floods could substantially help the prioritization of interventions and decision-making. In many instances this part of flood planning is also obviously very closely linked to another type of planning that has recently gained considerable support – the IUWM (see 2.3). This is because an increasing number of floods are not primarily linked to climate change but, rather, to the poorly planned expansion of urban areas resulting to significant changes of land use, reduction of plant cover and the sealing of the soils (buildings, pavements, concrete, asphalt, etc.), therefore inhibiting water percolation in the soil and dramatically increasing run-off. The situation is aggravated by the reduction in the historically unbuilt spaces, deltas, estuaries and other open natural areas occasionally flooded by rivers.

A recently developed and related planning tool useful in the overall IMF approach is the so-called "risk-based approach" (see Box 1.5).

Box 1.5. Risk-based approach (from van Beek and Lincklaen Arriens, 2014)

The risk-based approach to water security looks at how societies cope with variability. Rainfall, in particular, can be unpredictable and highly variable. There will always be dry and wet years and within those years there will be wet and dry periods. Many societies cope with variability by growing rain-fed crops in wet periods, by investing in irrigation and by building reservoirs with year-round storage to secure drinking water supplies for cities. Whatever steps are taken it is not possible to eliminate all water-related risks. This may be technically possible but may be too expensive. The question is – how much risk is socially acceptable? The answer depends on the socioeconomic impacts of system failure. In agriculture a 20 per cent risk (one in 5 years) is often considered acceptable. Designs for urban drinking water supply systems consider a much lower level of risk (e.g. one day in 5 years) acceptable.

A risk-based approach to water security generally consists of three steps:

1. Knowing the risks
2. Setting targets
3. Managing the risks.

Various frameworks apply this approach (Rees, 2002; Renn and Graham, 2006; OECD, 2013). The main challenge is to define, in step (3), the risks that are acceptable, tolerable or intolerable.

While the present risks of climate variability are reasonably well known from statistical analysis of historical records, future risks are unknown. This uncertainty applies not only to climate change and socioeconomic development, but also to society's perspectives on what is acceptable and tolerable. Perspectives may change, depending on socioeconomic conditions.

Another type of management plans linked to climate change adaptation that should be considered and integrated in coastal management are the so-called water efficiency plans. These may include extremely useful information and recommendations concerning water uses and possibilities for reallocation and improvements in certain practices, particularly in critical sectors of the economy directly linked with the availability and use of water resources in the coastal zone.

National (or subnational) management plans to combat desertification, suggested by the International Convention to Combat Desertification (ICCD) Convention are also useful, particularly when referring to soil or coastal erosion in a specific area and when they are combined with analyses of hydrological regimes and agricultural or forestry practices and/or risks. The management plans to combat desertification are frequently linked with valuable contingency plans (e.g. for wildfires). They may also include valuable observations/statistical data on droughts and floods from past periods, which are not usually linked with climate change induced by anthropogenic activities, allowing – eventually – assessment of background conditions.

Finally, there are various management plans aiming towards mitigation of climate change. "Smart" cities; sustainable transportation; programmes and plans for a green and blue economy, including energy efficiency and renewable energies, low-carbon technologies, sustainable management of land use, land-use changes and sustainable forestry are part of suggested interventions as part of the Nationally Appropriate Mitigation ActionS (NAMAS). When such interventions exist they should be mainstreamed through the IMF into long-, medium- and short-term policies and decision-making, depending on the level of the actual planning ability, culture, governance and capability in each country.

Chapter 2:
Theoretical Background of Integration and Key Aspects of Complementary Management Approaches

Previous chapters explained why we need integration of planning and management approaches in coastal zones, and presented the objectives of ICZM, IWRM and of coastal aquifer and groundwater management – the key components of the present IMF. Various planning approaches to be considered and integrated were also briefly explained. The most important aspect within this document is integration. In order to establish an appropriate understanding of this term as well as to provide useful guide for its achievement, the theoretical background of integration is presented in this chapter together with some of the key aspects, related principles and concepts. At the same time, it should be remembered that the general context within which integration is implemented is constantly changing (socioeconomic, natural, technological, tools, etc.), and with it the needed integration methodologies. However, the basic theoretical principles that guide integration are always valid and apparently they remain unchanged regardless of all the alterations brought about by the globalized technological society of the twenty-first century.

2.1 Integration and various aspects of management

To understand what integrated management is and how to approach and achieve it through planning processes and plans, one should clarify all related notions, meanings and terms. This is not always easy, since most of them were introduced several decades ago, but their acceptance by and familiarization within administrations and the wider public are relatively recent and there is frequently a variety of interpretations in their use and applications (see also 1.1 and 1.2). In addition to ICZM, IWRM and coastal aquifer and groundwater management, the most important notions directly involved with integrated management and planning are:

- Holistic approach/holistic management
- EcAp or Ecosystem-Based Approach (EBA)
- SD plans, planning and management
- Environmental management and planning, physical/space planning (urban planning, e.g. city planning and management)
- Environmental Resource Management (ERM)
- IUWM.

Many of the above terms and practices were developed almost in parallel in the third and mostly the fourth quarters of the twentieth century, and in the first years of the twenty-first century, by people of different disciplinary backgrounds and frequently different philosophical points of departure. The rather recent history of many of them does not make it easier for some to be combined or merged, because those who introduced or applied them originally are still involved and tend to “stick” to them, to defend the “orthodoxy” of their terms and “inclusiveness”, “superiority” or “completeness” in the approaches they prefer, supporting their views with examples from practical applications. Furthermore, although many admit the similarity or even commonality of the different approaches followed, they prefer to emphasize the differentiations and “nuances” that might exist. It is obvious that for the benefit of society, nature and the economy, a systematic effort is needed to enhance their commonality and foster synergies and integration.

In the present context, management is meant to refer to management of a resource (e.g. water) or a territory (coastal zone) and the activities influencing their status, development, exploitation and preservation/protection in order to achieve long-term objectives. It includes the sum or, better, the "cluster" of all kinds of measures, approaches and tools employed in order to handle them in the most appropriate way.

Most often management is defined through five functions: to plan, to organize, to equip, to direct and to control.

Planning is the first function of management to which we refer within ICZM, IWRM and coastal aquifer and groundwater management. In order to propose a useful and efficient management plan for the resource in question, or for the sustainable development of an area, profound knowledge of the area, its problems and causes of these problems, as well as opportunities for sustainability, should be taken into account. The complexity of contemporary societies, as well as current accumulated environmental challenges, means that any planning using an integrated approach becomes such a large task that considerable attention should be given to this step.

In English we use the terms "integrated" and "holistic" often without realizing their eclectic, conceptual relationship stemming from their original terminology in Greek. The term "integrated" comes from the Latin origin word "integral" which translates the Greek word "holocleroma" and "holoclerosis"; in mathematics, "integration". The root of both terms in Greek is "holon" (the whole), which is obviously also the root of the word "holistic". In both cases we are referring to methodologies (the integrated and the holistic approaches) where we are concerned about the "holon", the "whole", the "totality", the "entirety".

"Integrated management" allows for more complete understanding and accurate representation of the whole, respecting, however, the differentiations within it. It is still a "coordinated" approach but not a "homogeneous" one. On the other hand, the "holistic" approach considers the "holon" (the whole) as an entity, recognizing that the whole includes and represents more functions and characteristics than the sum of its parts/components. Obviously, the two approaches are complementary.

Related to the above is also what the great French philosopher, scientist and mathematician Blaise Pascal (1623-1662) taught us: that we cannot understand the whole without understanding its parts while it is impossible to understand the parts without knowing the whole.

Both "holistic" and "integrated" approaches are much more demanding and rewarding than the rather superficial so-called "general" or "generalized overview" or even the "eagle eye" or "helicopter" approaches which offer a quick overview of the situation. We will elaborate further on both integrated and holistic notions in the following chapters.

2.2 Links of ICZM and IWRM with physical, spatial and marine/maritime[1] planning

Historically, coastal planning and management were traditionally developed in the second part of the twentieth century and mainly since the 1970s as a subsystem of both physical/spatial planning and environmental planning and management. For this reason, it is important to have a better understanding of its "roots".

Physical planning has deep and old roots and is strongly related to land-use planning, urban design, transport planning, landscape planning, building plans, etc. It addresses activities that immediately affect and programme the physical structure and environment of cities and neighbourhoods (as opposed to economic planning or social planning activities) (CEMAT, 2006).

[1] Maritime spatial planning is used as a synonym.

Spatial planning refers to the methods used by the public sector to influence the distribution of people and activities in spaces at various scales as well as the location of the various infrastructures, recreation and nature areas (CEMAT, 2006). Spatial planning operates from the large-scale national or regional levels down to the local level. At its best, modern spatial planning is holistic – it sets out the vision and the policies for places on matters ranging from the location of major new infrastructures (e.g. for transport, energy or sewage treatment facilities) to employment development and the development of new retail, schools, housing or social facilities needed by local communities. It is also supposed to protect the most important habitats and heritage assets, while balancing society's future needs with the pressures created by climate change and other external natural and social factors.

Spatial planning has the potential to provide a single system, bringing transparency, accountability and coordination to decisions over the use of space. Therefore, ICZM and spatial planning, if the latter is implemented properly, are complementary: spatial planning could provide the regulated spatial framework for coastal areas within which ICZM could specify integrated management options and interventions. In this respect spatial planning, ICZM-IWRM and other targeted managements can work in synergy to realize – through projects, programmes and actions – the shared vision for the SD of the coastal zone and the river estuary in question. In such an approach, the integrated targeted managements should not be required to mediate between the basic uses of space, or the protection of important cultural and environmental assets from uncoordinated development. Rather, they should increase the value of spatial plans through adding the dynamic dimension of adaptive management; elaborating on the critical components of cost and water; focusing on and implementing actions; assisting in the resolution of conflicts; raising awareness on specific issues of priority; and securing corrections and improvements through feedback and participation.

A usual problem with spatial/physical planning is that it often remains disconnected from actual management on the ground and the competent authorities mandated with it. This problem could be addressed to a certain extent through the use and implementation of IMF.

Spatial plans are commonly arranged hierarchically with local/municipality plans nesting within wider regional/county strategies and plans, sometimes within a nationally determined planning framework. The ICZM Protocol reflects this approach.

Article 18 of the ICZM Protocol specifies a hierarchy of strategies and plans:
NATIONAL COASTAL STRATEGIES, PLANS AND PROGRAMMES

1. Each Party shall further strengthen or formulate a national strategy for integrated coastal zone management and coastal implementation plans and programmes consistent with the common regional framework and in conformity with the integrated management objectives and principles of this Protocol and shall inform the Organization about the coordination mechanism in place for this strategy.

2. The national strategy, based on an analysis of the existing situation, shall set objectives, determine priorities with an indication of the reasons, identify coastal ecosystems needing management, as well as all relevant actors and processes, enumerate the measures to be taken and their cost as well as the institutional instruments and legal and financial means available, and set an implementation schedule.

3. Coastal plans and programmes, which may be self-standing or integrated in other plans and programmes, shall specify the orientations of the national strategy and implement it at an appropriate territorial level, determining, inter alia and where appropriate, the carrying capacities and conditions for the allocation and use of the respective marine and land parts of coastal zones.

MSP is commonly understood as a public process for analysing and planning the spatial and temporal distribution of human activities in sea areas to achieve economic, environmental and social objectives. This is a relatively recent concept in spatial planning. The ultimate aim of MSP is to draw up plans to identify the utilization of maritime space for different sea uses (EC, 2013a). Decision IG20/2 of COP17 of the Barcelona Convention underlined "that Marine Spatial Planning is a major tool for ICZM and needs strengthening and better implementation".

In geographical terms, MSP deals with the sea, including territorial sea and open seas, and takes into account the activities along the coastal areas. In the Mediterranean, the external limit of the territorial waters is the seaward limit of the coastal zone, while the competent coastal unit is its landward administrative limit according to the ICZM Protocol of the Barcelona Convention (Article 3). The Mediterranean legal framework calls for a harmonized planning and management of the land and sea components of the coastal zone, which means that coordination of MSP, ICZM and IWRM interventions is needed for the common territory represented by the territorial waters, including coastal and transitional waters.

The case for a unified system for the whole coastal zone is, from the conceptual point of view, a simple one: the coastal zone including land, fresh water and sea as a single, continuous ecosystem. Onshore developments have critical offshore impacts (pollution, sedimentation, etc.). Similarly, offshore developments have critical onshore effects (erosion, pressure for infrastructure, visual amenity). The impacts on water systems exemplify the close relationship of the two parts. Influences such as seawater intrusion, altering river flows, construction of large desalination plants, alterations of the character and function of lagoons and intensive aquacultures clearly demonstrate the inseparable nature of onshore and offshore components.

It is important to emphasize that the level and exact nature of these effects depend critically on the characteristics of the coastal zone and the associated freshwater resources (river basin) and, to a lesser extent, seawater. It must not be forgotten that these mutual impacts change constantly and are also affected by seasonality and, of course, by development patterns and climate variability and changes in the specific river basin and coastal zone. With adequate understanding and care of the related marine issues, ICZM and IWRM have important roles to play in mediating between the two systems through, for example, representation in the integration process of the key stakeholders including various interest groups and users, as well as academia and research communities from the land, water and sea sectors.

Environmental Planning (EP) and Integrated Environmental Management (IEM) refer to the identification of desirable objectives for the physical environment (a subsystem of which is the coastal one) including social and economic objectives and the creation of administrative procedures and programmes to meet those objectives.

Obviously, the overall EP informs and supports environmental management, which involves land and the atmosphere in addition to the freshwater systems and the marine environment.

Occasionally the term IEM has been used by some authors to describe various environmental management attempts. In most cases, it has been linked more systematically to the urban environment. In 2007 the EC published a paper under the title *"Integrated Environmental Management: Guidance in relation to the Thematic Strategy on the Urban Environment" (Technical Report 2007–13,* http://ec.europa.eu/environment/urban/pdf/iem.pdf). This states that "integrated approaches include long-term strategic visions and link different policies at different administrative levels to ensure coherence. IEM also means tackling related issues together, such as urban management and governance, integrated spatial planning, economic well-being and competitiveness, social inclusion and environmental stewardship".

In conclusion, on the basis of the above definitions and clarifications, the objective of ICM and planning is the "preservation of coastal resources while simultaneously satisfying the sometimes conflicting needs, interests and requirements of protection, development, usage and conservation in the coastal zone" (EEA, http://glossary.eea.europa.eu/terminology/concept_html?term=coastal%20zone%20planning); in other words, the creation and maintenance of enabling conditions for the SD of the coastal zone and the adjacent aquatic systems.

2.3 Links of ICZM and IWRM with different types of management approaches

ERM is the wider category within which water, in particular, and other natural resources management approaches are included.

A natural resource is something (e.g. water, a natural forest, or a kind of plant or animal) that is found in nature and is valuable to humans. Environmental resources usually include natural resources and environmental services. Ecological, ecosystem or environmental services are closely linked to biogeochemical mechanisms that regulate flows of matter and/or energy that directly or indirectly affect the economy and so-called natural capital. The latter is an extension of the economic notion of capital (manufactured means of production) to environmental (or ecosystem) goods and services. It refers to a stock (e.g. a forest, a wetland, a river) which produces a flow of goods (e.g. new trees, fish) and services (e.g. carbon sequestration, erosion control, saltwater intrusion control and provision of habitat). Natural capital can be further divided into renewable natural capital and non-renewable natural capital. It is noteworthy that the level of flow or use of non-renewable natural capital (e.g. mining of fossil fuels or of fossil water) is determined politically and, therefore, even if it is advisable to be part of the integrated management it may or may not become a component of either IWRM or ICZM depending on the governance conditions and patterns.

ERM is therefore defined as "a purposeful activity with the goal to maintain and improve the state of environmental resources simultaneously for several of them affected by human activities" (Pahl-Wostl, 2004). It is important to understand that it is not the management of the environment as such, but rather the management of the interaction and impact of human societies on the environmental basis of our livelihoods and economy as a whole.

ERM aims to ensure that ecosystem services are protected and maintained for equitable use by future human generations and also to maintain ecosystem integrity as an end in itself by taking into consideration ethical, economic and scientific (ecological) variables. ERM tries to identify the factors with a stake in the conflicts that may rise between meeting the needs of societies and protecting the resources and, in this way, to a large extent covers many, if not all, the SD parameters. Obviously, IWRM is the ERM that refers to water.

IUWM deals with water supply management, storm water or surface water management and wastewater management in urbanized parts of the coastal zone. IUWM comprises the design, distribution, connection, economics, organization and governance of centralized or decentralized water systems for the networks of settlements within the coastal zone in question. This indicates the particular importance of IUWM for both IWRM and ICZM, since IUWM sustainability is a precondition for urban zone sustainability. It is also important to recognize that IUWM effectively includes in the water cycle the "new", non-conventional water resources and is one of the most advanced and rapidly developing management practices as it concerns the use of models and, more specifically, computer modelling.

Holistic management is part of the wider overall holistic approach. It refers to a systems thinking approach for the management of natural resources that builds biodiversity, improves production, enhances prosperity, supports sustainability and improves quality of life for those who use it.

Holistic management is supposed to offer a decision-making framework that allows managers in

a variety of cultures, countries, enterprises, etc., to be assured that their decisions are socially, economically and environmentally sound, both in the short term and in the medium to long term. Although, as described above, the objective of this management coincides with those of SD management, it places greater emphasis on the decision-making process itself and includes the notion of the so-called holistic goal to guide decision-making. The holistic goal is, therefore, becoming the basis of the vision. This ties people's desired way of life, based on what they value most deeply (materially, emotionally and spiritually) to the ecosystems and resources that support their vision. In this respect the determination of the vision becomes a key component of the management. When it comes to management tools, however, the framework is more limited in scope.

The Gaia hypothesis

The Gaia hypothesis is perhaps the fullest holistic approach to an overall earth system because it treats the earth as a single living organism (system) in which biological, chemical and physical factors all play important and interrelated roles. This inseparable whole is regulated and kept adapted for life by living organisms themselves. According to this theory, Gaia is a "complex entity involving the Earth's biosphere, atmosphere, oceans and soils; the totality constituting a feed back or cybernetic system which seeks an optimal physical and chemical environment for the life of this planet" (Lovelock, 1979).

The EcAp, or EBA, was adopted by the Conference of the Parties of the Convention on Biological Diversity (CBD) as the primary frame for action under the Convention (www.cbd.int/convention). It is defined as a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The vision behind the EcAp is that, through this approach, natural systems are planned and managed so as to provide their services and function at least sufficiently well. The EcAp does not refer to any particular resource but can refer to any functioning unit at any scale. This understanding is particularly important for river, aquifers, coasts and seas, where the nature of water keeps systems and functions interconnected. An important emphasis of the ecosystems approach is on the non-linearity and complexity of the ecosystem processes, for many of which we have still incomplete understanding and knowledge, and their outcomes are often characterized by time lags and surprises. Any management that is taking into account the EcAp should be adaptive and apply the "precautionary principle" in responding.

The EcAp does not preclude other management and conservation approaches. It is recognized that "there is no single way to implement ecosystem approach" but "it may be used as the framework to integrate the different approaches for delivering the objectives of the connection in practice" (Convention on Biological Diversity, https://www.cbd.int/decision/cop/?id=7148). Essential for the integrated approach promoted through the IMF guidelines is article 6b of the Convention on Biological Diversity which provides that "each Contracting Party shall integrate, as far as possible and as appropriate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies". The main "value added" of the EcAp for the Mediterranean as developed in the context of the Barcelona Convention (i.e. EcAp process) is a "renewed emphasis on implementation and integration that will strengthen ability to understand and address cumulative risks and effects as well as to better focus the action on priority targets" (Barcelona Convention: http://planbleu.org/sites/default/files/upload/files/Information%20Note%20EcAp%20Process.pdf). In this respect, the IMF guidelines perfectly respond to and incorporate the EcAp in

their design and implementation, thus implementing the requirements of the ICZM Protocol.

In fact, the EcAp further elaborates on and adds to standard ICZM and IWRM approaches on the application of appropriate scientific methodologies, focusing on levels of biological organization that encompass the essential processes, functions and interactions among organisms and their environment. Furthermore, it recognizes that humans, with their cultural diversity, are an integral component of ecosystems (as explained in section 3.2, *Integration across systems*). Twelve complementary and interlinked principles of management have been proposed for the EcAp (see Box 2.1, below).

Box 2.1. The 12 principles of the ecosystem approach

1: Recognise objectives as society's choice.

2: Aim for decentralised management (i.e. subsidiarity).

3: Consider the extended impacts, or externalities.

4: Understand the economic context and aim to reduce market distortion.

5: Prioritise ecosystem services.

6: Recognise and respect ecosystem limits.

7: Operate at an appropriate scale, spatially and temporally.

8: Manage for the long-term, considering lagged effects.

9: Accept change as inherent and inevitable.

10: Balance use and preservation.

11: Bring all knowledge to bear.

12: Involve all relevant stakeholders.

Joint Nature Conservation Committee (http://jncc.defra.gov.uk/page-6380)

To provide practical assistance in applying the EcAp in the field, the International Union for Conservation of Nature (IUCN) Commission on Ecosystem Management (CEM) has proposed organizing the 12 principles into five steps, each step involving a range of actions:

- Step A: Determining the main stakeholders, defining the ecosystem area and developing the relationship between them
- Step B: Characterizing the structure and function of the ecosystem, and setting in place mechanisms to manage and monitor it
- Step C: Identifying the important economic issues that will affect the ecosystem and its inhabitants
- Step D: Determining the likely impact of the ecosystem on adjacent ecosystems
- Step E: Deciding on long-term goals, and flexible ways of reaching them.

The CEM underlines that Step A involves the most difficult issues for applying the EcAp and reminds that previous attempts to manage biodiversity have tried to fit stakeholders to a chosen area without considering the broader implications of the EcAp, which stresses societal choice. To this end, the CEM recommends working simultaneously on defining the ecosystem area and on determining the stakeholders who will support the selection and management of that area.

The Man and the Biosphere (MAB/UNESCO) approach and programme for the Management of Biosphere Reserves (BRs) was first established by UNESCO in 1971 and has evolved since then. It shares many perspectives, objectives and tools with the EcAp (see Solving the Puzzle: The Ecosystem Approach and Biosphere Reserves, www.unesdoc.unesco.org).

BR management focuses on a multi-stakeholder system involving local communities, scientists, national and local government authorities and, increasingly, other stakeholder groups such as representatives of the private sector (the food industry, the tourism industry, etc.). BRs aim at promoting ecosystem management by protecting genetic resources, species, land and water, and through their sustainable use. Taking into account that each sector of society views ecosystems in terms of its own economic and societal needs, BRs seek to foster economic development compatible with conservation. They also "develop a continuum of scientific and educational activity to underpin sustainable resource management" (Hadley, 2002).

The MAB programme has developed a zoning system of differentiated intensity of management which is now widely used not only in BRs but also in many other types of designated areas where the needs and aspirations of the local population have to be considered. Ideally, each BR should contain three zones that have to be implemented in site-specific patterns to meet local needs and geographic conditions (Figure 2.1). First, there must be one or more core areas of intensive management. Originally, these were securely protected sites for conserving biological diversity, monitoring minimally disturbed ecosystems and undertaking non-destructive research and other low-impact uses. Next is a clearly identified buffer zone, which usually surrounds or adjoins the core areas, and is used for cooperative activities compatible with sound ecological practices. Last, there is a flexible transition area, which may contain a variety of agricultural activities, settlements and other uses, in which local communities, management agencies, scientists, non-governmental organizations (NGOs), cultural groups, economic interests and other stakeholders work together to manage and sustainably develop the area's resources (Hadley, 2002).

Countries apply this zonation scheme in different ways to accommodate their geographical conditions, sociocultural settings, available legal protection measures and local constraints. The core area can correspond to an existing or new protected area such as a nature reserve or a national park. This may require specific legal provisions limiting human access to research and monitoring purposes. The whole concept of zoning in BRs integrates a dimension of flexibility and can be used creatively in order to facilitate the "mosaic" integration of specially designated areas into the wider bioregional landscape (Scoullos *et al.*, 2013).

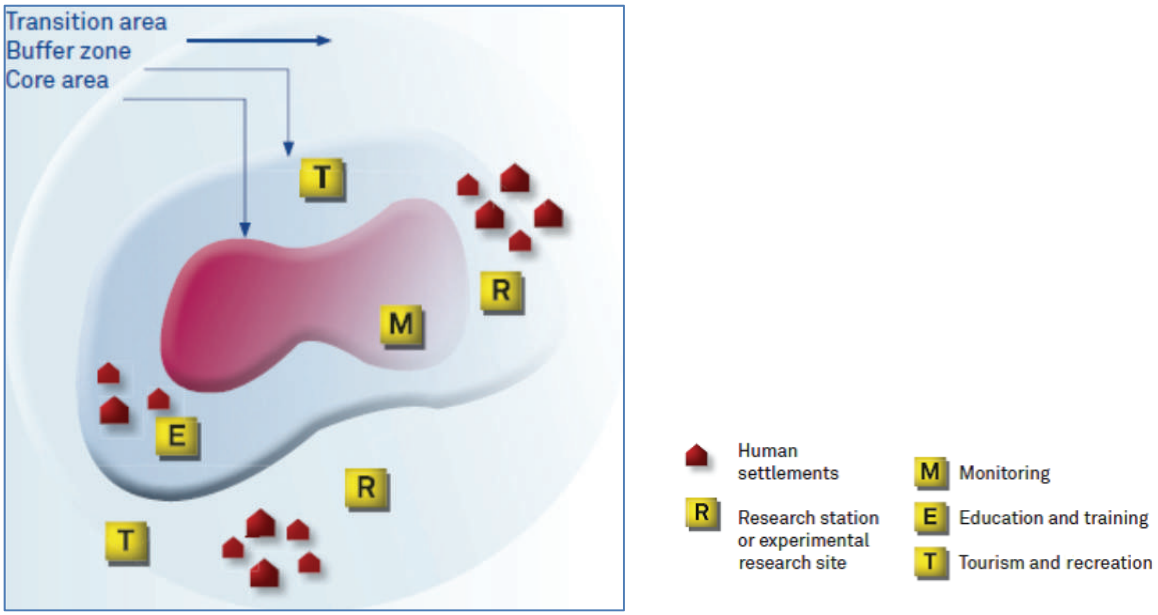


Figure 2.1. Typical biosphere reserve zonation (http://portal.unesco.org/geography/en/ev.php-URL_ID=8763&URL_DO=DO_TOPIC&URL_SECTION=201.html)

The MAB/BRs zoning principle of differentiated intensity of management can also be expanded and applied in coastal areas to accommodate different biodiversity densities, geographical conditions, sociocultural settings, available legal protection measures and local constraints.

There is also some analogy with a tool used sometimes in ICZM, namely preservation by concentration. The latter is a widely accepted approach for preserving open coastal areas from so-called "ribbon development", or linear extension of the urban development first described by Doxiadis (1964). Ribbon development along the coastline represents an unsustainable type of development, often referred to as "littoralization", which is particularly destructive to natural ecosystems, minimizing/inhibiting ecosystem services. Article 8.3 (b) of the ICZM Protocol, therefore, is inviting countries to limit such development. The best way to preserve open coastal areas is to concentrate growth around existing urban areas (Zones A, Figure 2.2), and to use regulatory, fiscal and economic instruments to discourage ribbon development along the coast (Zones B and C). Obviously, Zones A and B are expected to have differentiated management (see Figure 2.2).

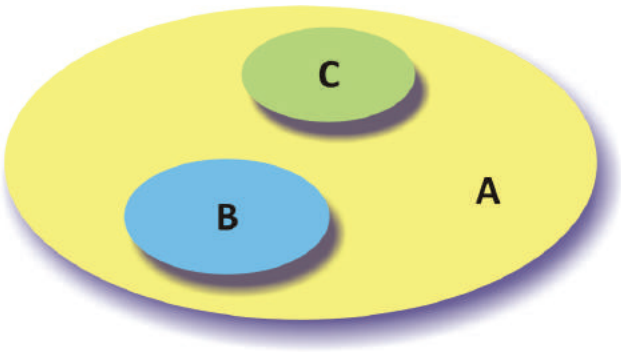


Figure 2.2. The concept of differentiated intensity of management: in C>>B>A

Related to the above is a very important principle, extremely useful for ICZM: the "fit-for-use" approach. According to this, the management, criteria and level of restoration/rehabilitation of an eventually heavily polluted or otherwise deteriorated site does not have to reach the GES, provided that it does not endanger neighbouring areas and fulfils the criteria for the specific long-term use it is designated for. This principle was initially introduced for the management of "brown areas": heavily polluted sites such as extensive abandoned industrial areas, abandoned harbours, airports or military installations, etc. These sites require appropriate management and upgrading to a status suitable for the new activities they are destined for. In this framework, it is advisable for new industries, even if they follow state-of-the-art technology, to be installed in appropriately cleaned old industrial sites rather than to occupy new "green lands". In this respect, it is another aspect of the principles of "differentiated intensity of management" and of "preservation by concentration".

SD management refers to management according to the principles and guidelines of SD, thus integrating economic, social and environmental considerations and targets. SD planning and consequent management of coastal areas need to address major challenges inherent in the complex systems involved at the land-freshwater-sea interface where integration of biogeochemical with socioeconomic factors is both essential and difficult. In SD planning and management all three aspects (economy, environment, society) are combined to ensure that the development of a particular area (e.g. coastal zone, city or region) is such that it fulfils the present needs and aspirations of its society without inhibiting future generations to obtain similar benefits from its natural and cultural resources, considering both the carrying capacity of the local systems involved and the ecological footprint on other regions or the future. In the 1990s and 2000s, after Rio, a number of SD management plans were elaborated at the local level under "Local Agendas 21" with different degrees of ambition and success.

At a different level, some of the methodologies needed were developed through the EU-supported research project SUDECIR (SD in European CIties and Regions). The steps used by SUDECIR for drafting SD plans are presented and considered later in this document. One of the unique characteristics of the SUDECIR methodology, useful for IMF approaches in designing and implementing

ICZM plans, is (1) the fact that although by definition SD planning takes into account all sectors and stakeholders, the economically/socially prevailing ones in the region in question could be used as "drivers/driving force" with the assumption that if the influential sector is developed in a sustainable way the other sectors will follow a similar path as a consequence; (2) that the definition of the vision is of utmost importance for the plans; and (3) that the integral part of the visions are the "sustainability criteria/indicators" to be adopted and which are not only objective (set by experts), but negotiated and subjective, accepted/approved or even developed by the stakeholders involved.

2.4 SD objective of integrated plans

Integrated management and SD are mutually reinforcing notions. SD embodies integration, understanding and acting on the complex interconnections that exist between the environment, economy and society. This is not a balancing act or a playing of one issue off against another, but recognition of the interdependent nature of these three pillars (Drexhage and Murphy, 2010). On the other hand, the analysis of all integrated management schemes, examined briefly in previous chapters, indicates clearly that their final aim is to approach or contribute to SD at various levels (local, regional, global) using different entry points. SD management requires deep understanding of the concept of SD and the tools available for its attainment. Appropriate/good governance has been identified as being the essential condition to deliver the needed integration. Therefore, to the original scheme of the Greek temple with three pillars of SD proposed in Rio 1992 (see Figure 2.3), a foundation is added. As proposed by Scoullos (1998), this foundation is governance (see Figure 2.4).

However, even in this figure, it is very unclear how environment, economy and society interact with each other for the achievement of SD; we know that most phenomena in the real world are not purely economic, social or environmental but combined (socioeconomic, etc.).

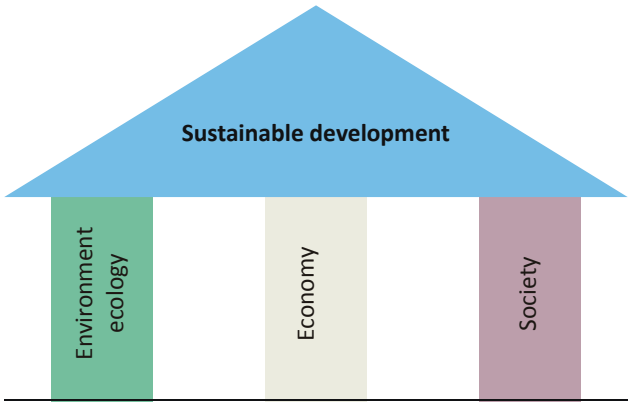


Figure 2.3. Sustainable development and its pillars according to Rio (1992)

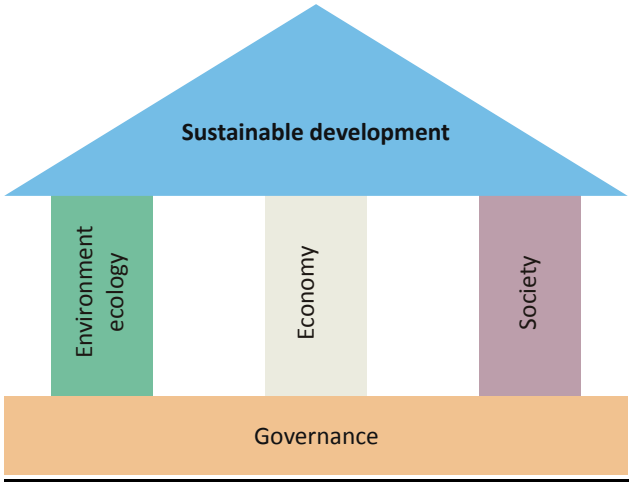


Figure 2.4. The proposed place of governance in the sustainable development structure

In this respect, the non-pillar integrated visualization for SD has been introduced, which no longer refers to pillars but to "facets" of a tetrahedron (Figure 2.5) (Scoullos, 2003). The tetrahedron, by the way, is the most stable structure we know on earth. Each facet may be considered as expanding indefinitely. However, only the part that contributes to the formation of the tetrahedron corresponds to SD. For instance, from the entire economy, which is represented by the economy pillar (Figs 2.5 and 2.6), the corresponding facet in the tetrahedron represents the environmentally and socially sound economy (e.g. green economy), etc.

This visualization allows us to understand that SD can be obtained only through integration of major elements of each one of the three components with the assistance of governance and makes clear that for each case (coastal zone, locality, region, country, etc.) the proportional mix may differ but all three ingredients should be parts and contribute to the solution in an integrated way.

An additional strength of this representation is the possibility of differentiating the basis of the tetrahedron according to the starting point or historic tradition and "strength of departure" for each type of management. Strength of departure refers to the fact that in some areas the initial purpose of management may have been different; for instance economic development, environmental protection or social development. Usually this sector could be considered as prevailing or guiding. In the EcAp the natural environment and the functioning of its ecosystems is the entry point. Indeed, if you turn the tetrahedron on the environment facet this becomes the basis/entry point (Figure 2.6) and all the other three facets represent the "human overstructure", the "anthroposphere" that needs to be appropriately adapted/managed in order to deliver a development compatible to the functioning of the ecosystems.

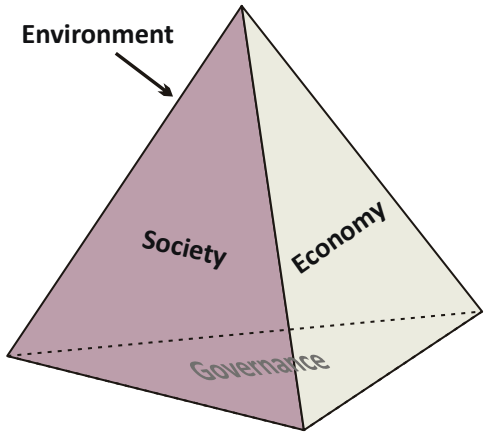


Figure 2.5. The tetrahedron of sustainable development: the new structure for sustainable development

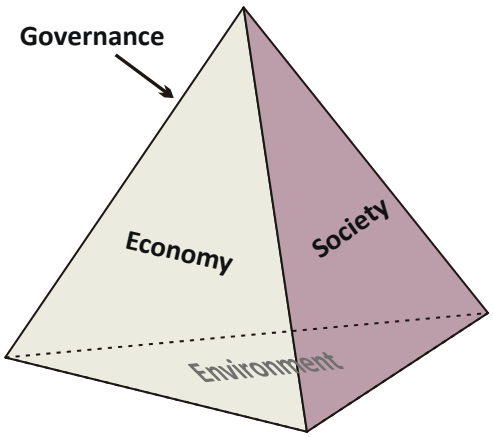


Figure 2.6. The "anthroposphere" based on the natural environment

Governance is about *"the interactions among institutions, processes and traditions that determine how power is exercised, how decisions are taken on issues of public and often private concern, and how citizens or other stakeholders have their say". Or, more succinctly: "Governance determines who has power, who makes decisions, how other players make their voice heard and how account is rendered".*

http://iog.ca/blog/defining-governance

Furthermore, governance also includes how the decisions are implemented; that is, the tangible and intangible means and processes necessary for governance to become operational. In this way governance links to management.

2.5 Role of governance

As mentioned in chapter 1, the role of governance is fundamental because only through it is SD possible. To better understand and demonstrate this, we have to analyse the most basic elements of governance (Figure 2.7). According to Scoullos (2003, 2004) and Scoullos *et al*. (2013), repeated by Brusis and Siegmund (2011), these are:

1. Institutions in their widest sense: international, regional, national, local and all legal and regulatory instruments (laws, etc.), as well as the enforcement mechanisms (administrations, monitoring, policing, justice, etc.)
2. The scientific and technological tools, methods, infrastructures and constant inputs of innovation that allow the technical expansion of the carrying capacity of our systems and facilitation of the natural mechanisms to cope with anthropogenic pressures (e.g. sewage treatment plants, composting and recycling plants)
3. The widest information/education, consultation and participation processes that deal with cultural-behavioural changes of individuals, groups and society at large
4. By combining Figures 2.6 and 2.7, we arrive at Figure 2.8 which depicts the three fundamental components of SD and the major governance management tools to obtain sustainability.

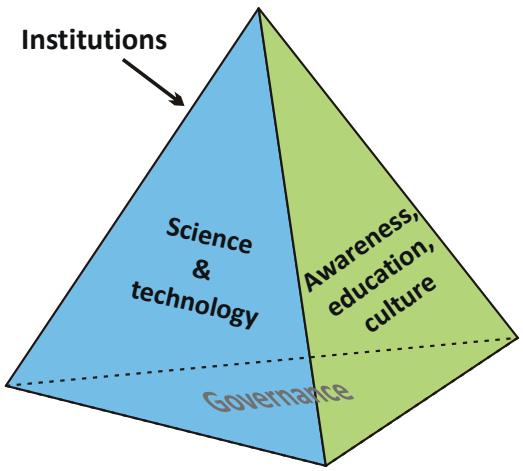


Figure 2.7. The analysis of governance tools to obtain sustainable development

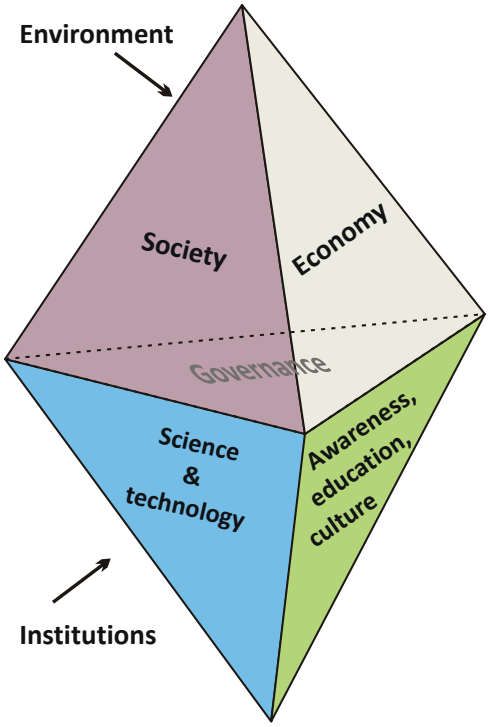


Figure 2.8. Sustainable development and tools to achieve it

In this way, governance is understood as the interface between the SD goals and objectives and the tools to obtain them. It is clear that appropriate governance determines first the proper mix of economic, societal and environmental objectives (eventually also accompanied by appropriate SD indicators), which corresponds to the needs and aspirations for SD of the specific case (place, time, conditions). In order to achieve these objectives, the appropriate governance prepares and implements an integrated management scheme. This combines, in the most suitable and "wise" way, the regulatory legal/administrative with the technological tools and the information/participatory/cultural processes.

It is, therefore, evident that for each of the integrated management schemes already mentioned we need a slightly different mix of environment/economy/society components obtained through appropriate combination of the institutions, society and technology/innovation and awareness/education/cultural tools. The criteria and indicators needed are common, in most cases, and in many of the management practices are encapsulated into the

effort to obtain the so-called GES, which links the EcAp to IWRM, ICZM, MSP, WFD, MSFD, Integrated Maritime Policy (IMP), etc. This does not mean that, in cases where severely polluted or deteriorated sites exist in a given coastal area, integrated management cannot be designed or implemented unless GES is achieved. As explained already, integrated management (based on the concept of differentiated intensity) could obtain GES through rehabilitation of soils, for instance, in some sites where this is needed and feasible; while in other sites, destined for new heavy industrial activities, the application of the fit for purpose/fit for use approach may be sufficient.

In conclusion, the basic philosophy behind wise, integrated management of any kind is the appropriate, socially just/equitable and economically viable use of the environment/natural resources and ecological services, the maintenance of biodiversity and proper functioning of ecosystems through the best use of man-made, cultural, knowledge and human capital within ambitious but realistic and doable operational frameworks. This can be delivered through appropriate and/or good governance, the principles of which are presented in Table 2.1. It is noteworthy that the notion of good governance is more frequently used in the context of developing countries and also signifies respect for democratic institutions and anti-corruption measures.

In Box 2.2 some definitions proposed for water governance could be extrapolated for the overall governance suitable for dealing with integration.

Table 2.1. Five principles of good governance adjusted from the PEGASO conceptual framework (from Abrams *et al*., 2003, modified)

	The United Nations principles on which the five principles are based	**Related ICZM area governance responsibilities**
Legitimacy and voice	Participation: All men and women should have a voice in decision-making, either directly or through legitimate intermediate institutions that represent their intention. Such broad participation is built on freedom of association and speech, as well as on capacities to participate constructively. Consensus orientation: Good governance mediates differing interests to reach a broad consensus on what is in the best interest of the group and, where possible, on policies and procedures.	▪ *Promoting the free expression of views, with no discrimination related to gender, ethnicity, social class, etc.* ▪ *Fostering dialogue and consensus* ▪ *Fostering relations of trust among stakeholders* ▪ *Making sure that rules are respected because they are "owned" by people*
Accountability and responsibility	Accountability: Decision makers are responsible for their decisions and actions and accountable to the public, as well as to institutional stakeholders. This accountability may differ depending on the organizations. Transparency: Transparency is built on the free flow of information. Processes, institutions and information are directly accessible to those concerned with them. Adequate information is actively provided by the authorities to understand and monitor institutions and their decision-making processes.	▪ *Making sure that stakeholders possess adequate, reliable information and knowledge, and quality of knowledge, regarding what is at stake in decision-making, who is responsible for what and how responsibilities can be made accountable* ▪ *Making sure that the avenues to demand accountability are accessible to all* ▪ *Making sure that accountability is not limited to verbal exchanges but linked to concrete and appropriate rewards and sanctions*
Performance	Responsiveness: Institutions and processes try to serve all stakeholders. Effectiveness and efficiency: Processes and institutions produce results that meet needs while making the best use of resources.	▪ *Ensuring a competent administration* ▪ *Making certain there is sufficient institutional and human capacity to carry out the required roles and assume the relevant responsibilities* ▪ *Being robust and resilient, i.e. able to overcome a variety of threats/obstacles and emerge strengthened from the experiences*

	The United Nations principles on which the five principles are based	Related ICZM area governance responsibilities
Fairness	Equity: All men and women have opportunities to improve or maintain their well-being. Rule of law: Legal frameworks are fair and enforced impartially, particularly the laws on human rights.	▪ *Making sure that development is undertaken with decency, without humiliation or harm to people* ▪ *Ensuring that the governing mechanisms (e.g. laws, policies conflict resolution forums, funding opportunities) distribute equitably the costs and benefits deriving from development* ▪ *Making certain that public service promotions are merit-based* ▪ *Being consistent through time in applying laws and regulations* ▪ *Providing fair avenues for conflict management and, eventually, non-discriminatory recourse to justice*
Direction	Strategic vision: Leaders and the public have a broad and long-term perspective on good governance and human development, along with a sense of what is needed for such development. There is also an understanding of the underpinning historical, cultural and social complexities.	▪ *Providing effective leadership, generating and supporting innovative ideas and processes* ▪ *Providing or supporting initiatives to increase the use of collaborative learning in various forums*

Box 2.2. Defining governance related to water

The GWP defines water governance as "the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society".

Water governance, according to a recent Organisation for Economic Co-operation and Development (OECD) study, encompasses administrative systems and formal institutions (including laws and policies) as well as informal institutions such as power relationships and practices. This can include the political level, and the OECD study also cites the Stockholm International Water Institute (SIWI), which has stated that water governance "determines who gets what water, when and how" (OECD, 2011).

Consequently, water governance is about the relationships for water management within the RBM system rather than simply about government-led processes. Moreover, stakeholders are not simply "water users" or "interests"; some are major elements of local economies and societies, as in the case of agricultural interests in farming areas, and as such are part of water governance. Moreover, the active involvement of these stakeholders – as per the WFD – is a key element in terms of integrating water management across economic sectors and consequently for the success of water management goals (EEA, 2014).

"Groundwater governance comprises the enabling framework and guiding principles for responsible collective action to ensure control, protection and socially-sustainable utilisation of groundwater resources for the benefit of humankind and dependent ecosystems." (Foster and Garduno (2013), cited in Global Diagnostic on Groundwater Governance, Groundwater Governance a Global Framework for Action (Draft Edition, January 2015), available at www.groundwatergovernance.org/fileadmin/user_upload/gwg/documents/Global_Diagnostic_on_Groundwater_Governance_Draft.pdf).

2.6 Understanding the meaning of "integration of integrated plans"

Integration means incorporation, merging and synergy of the parts of the different components to obtain better information and comprehension, better coordination, coherence, avoidance of inappropriate policies, strategies, investments and activities that are incompatible and mutually inhibiting, distracting, overlapping or simply repeating each other.

In other words through integration we aim at increasing knowledge management efficiency, harmonization, consistency and economy in human, material and financial resources. We aim at providing a better, all-embracing management and make governance more efficient and effective. Integration addresses different disciplines, layers of governance, sectors, interests, aspects and points of view.

To obtain a more integrated approach usually requires, at the initial stages, more effort and higher levels of cooperation and coordination of different administrations and sectors at all levels. This is not an easy task, particularly if cooperation and integration culture is not developed in a particular country or area. In this respect, because integration is an objective but, most importantly, a mean/tool and not an end in itself, there is always a limit to what should be integrated and what should either be dealt with separately, or be left aside and combined as an additional element at a later time, when the circumstances allow. The ultimate aim is, of course, the maximum integration of all relevant components and plans. However, realism, practical spirit and common sense are crucial for successful integrated planning and management. For instance, sometimes 80 per cent of the negative impacts may be caused by 20 per cent of pressures. In such cases, integrated policies should primarily focus on those to ensure a satisfactory response.

The balance is based on the appropriate choice of the components (e.g. sectors) to be combined; the tools to be employed and the degree of integration required may differ significantly from case to case. In the IMF integration refers, at the first level, to the overall methodologies of ICZM and IWRM including both surface waters and groundwaters; and, at the second, to the individual components of each of these methodologies as they are used in the planning that is needed. In fact, the two are closely interrelated and considered in combination in order to make the whole approach less theoretical and more understandable through examples.

In combining ICZM with IWRM, including groundwaters, it is absolutely fundamental for all actors involved in the drafting and implementation of management plans to understand in depth what is common between the two (or among more of them) and what is, eventually, different.

It is obvious that in various regions/cases the commonalities or differences, respectively, may be differentiated. However, in the vast majority of cases it is expected that the common/overlapping part between the two approaches overbalances the parts relevant only to each one of them (see Figure 2.9). Furthermore, a truly integrated plan is not only Part I (i.e. the "common"), but the "entire", (i.e. Part I + Part II + Part III and, even better, the "entire plus"). To sum up, in order to produce the plan for Part I, the problem approach that is to be used, can take us to any place within the "entire plus" where the problem is created. Therefore, the plan for Part I may contain the recommendations, actions, measures or interventions that are also related to the "entire plus".

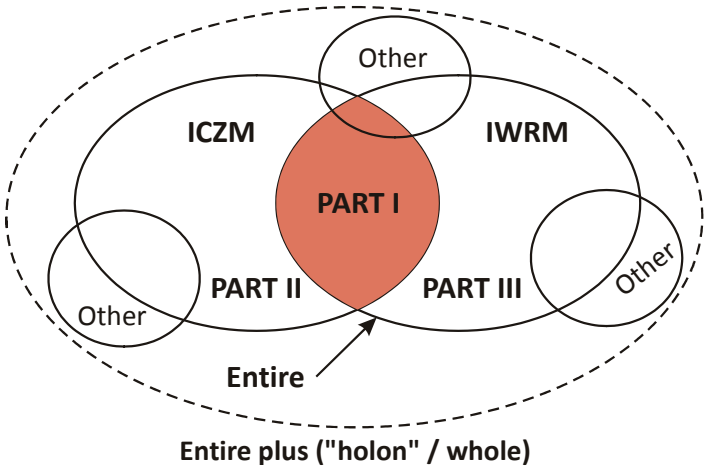


Figure 2.9. Visualisation of ICZM, IWRM and other management practices

Given that there is a tendency to incorporate the EcAp in integrated plans, it is relevant to summarize the specific provisions (objectives and requirements) that need to be observed for ensuring that the EcAp has been respected.

Objectives:

- The collective pressure of human activities is kept within levels compatible with the achievement of GES.
- The capacity of ecosystems to respond to human-induced changes is not compromised.
- The use of ecosystem goods and services by present and future generations is sustainable.

Requirements:

- The preservation and enhancement of ecosystems and ecosystem services is systematically taken into account in the development of human socioeconomic activities.
- The objectives to protect and restore the environment should increasingly set the boundaries for sustainable use of the natural environment.
- The above do not exclude that part of the system might not reach the GES but at least the "fit for purpose/use" approach should be observed.

2.7 Some basic concerns: multi- and trans-disciplinarity; implementability; relevance and adaptability; priority versus sectoral approach

Perhaps the most serious and common problems affecting all plans and management schemes are their low implementability and/or improper implementation. Reasons for these lie between technical incompleteness or deficiency, unrealistic targets, wrong/lack of timeliness (too early or too late) and political (un)willingness to overcome political costs that may result from the implementation of the plans.

In many cases a deficient or dysfunctional plan results from a partial and incomplete approach, based on inadequate data, unrealistic expectations and bias, giving emphasis on a few aspects while ignoring or neglecting others that may be equally or more critical.

Traditionally, integrated plans and management of both IWRM and ICZM were inspired and informed by natural processes and mechanisms involving circulation of water (water and sediment) and energy (photosynthesis, energy production and consumption). The hydrological cycle, for instance,

was and is still of fundamental importance for understanding the different aspects (e.g. physical, chemical, biological, geological) of the processes involved and deciding on the appropriate measures to be included in an integrated management plan. Understanding the basic processes in nature requires a multi and trans-disciplinary approach. Still, trans-disciplinarity for approaching natural processes, though a prerequisite for integrated management, is no longer a "necessary" and/or "sufficient" condition. Multi and trans-disciplinarity should also include other fields of knowledge and expertise. Consequently, the basis of integration is the proper understanding of all the following:

- Basic biogeochemical processes in nature
- Basic sociopolitical and economic parameters
- Basic cultural and behavioural features of the groups/stakeholders involved
- Governance strengths and bottlenecks.

Furthermore, in practical terms, it is no longer adequate to have in the management plan a chapter or a set of provisions and measures dealing with, for example, biological resources management, another on geology, a third on economic tools and investment and a fourth on regulations, elaborated by different experts, if there is no clear and functional internal coherence and synergy.

Another important problem for proper implementation is the fragmentation of the authorities and competences that are needed and expected to provide coordination of the implementation. Ministries in most of the Mediterranean countries tend to work in silos and if there is no established management coordination scheme the results are relatively poor, so the plan needs to provide for the mechanisms of its implementation (governance scheme processes, communications, etc.).

It is true that engagement of the various stakeholders and local society, in particular in preparing and introducing an integrated plan, is not time-neutral. There are specific, more favourable moments than others (timeliness) for initiating such plans and these are normally linked with the development and the phases to be followed. Due consideration of all the above may enhance the implementability of a management plan.

One of the essential characteristic of an integrated plan is adaptability. Adaptability is an inherent quality of flexibility that needs to be built in and maintained or even enhanced with time. Adaptability is requested explicitly under the EcAp and, of course, it is the core quality for addressing the impacts of climate change and variability. Very high levels of adaptability of an integrated plan lead to so-called adaptive management, which is not another type of management but rather a quality that all integrated management plans should have.

Key principles of adaptive management are:

- flexibility and adaptability of the measures to implement ICZM and IWRM including groundwater management and any other compatible planning inputs
- regular update of sustainability targets to take into account the changes observed (opportunities and bottlenecks) in the system
- provisions for integration of the outcomes of future scientific research.

The main instruments/methods employed for its implementation are:

- monitoring programmes: measuring progress towards targets (GES or "fit for purpose/use"), using sets of targets
- updating and ameliorating strategies according to the outcomes of the monitoring process.

Many refer to adaptability in relation to emerging issues or changing conditions. In fact for this type of adaptability, flexibility is what we are looking for. However, there is also another aspect of adaptability that is rarely mentioned as such. This is obtained by constant improvement and readjustment of plans through feedback/amelioration and refinement of pre-existing management schemes or parts of them.

Actually, building on existing plans is in many cases preferable to abrupt and drastic changes, particularly if the rest of the conditions (political, socioeconomic, etc.) remain basically unaltered.

Finally, the safest way to enhance implementability is by having a plan that is simple, understandable by non-experts and based firmly on common sense. Such a plan has more chance of gaining the support and ownership of stakeholders, and particularly of those who should assist its implementation.

It is not to be expected that integration can take place perfectly from the beginning. Integration is usually obtained as the outcome of a process in which a multidisciplinary team contributes. By working together, people with different experiences and backgrounds are learning to think out of their "discipline boxes", progressively achieving trans-disciplinarity and ultimately reaching a holistic understanding of and consensus on the issue in question. In section II (planning process) more details and recommendations are provided on how integration should be secured throughout the process.

Chapter 3:
Aspects of Integration of ICZM with IWRM and Other Frameworks

Integration is complex and diverse. It requires a clear definition of the system, its boundaries, its transboundary and inner subsystems dimensions, their connections and processes. For IMF, the coastal ecosystem is in the focus and includes land, fresh surface and groundwater, sea, associated living resources and the man-made environment. Importantly, this system has vital and integral connections with the upstream river basin system and the downstream marine system.

3.1 Integration and geographical coverage

The coastline is the interface zone not only between land and the sea but also between fresh waters (surface and ground) and the marine environment. As it concerns IWRM, this interface zone extends to the entire borders of the river basin, its catchment area with the sea, and in most cases coincides with the coastline addressed by the ICZM.

According to the EU WFD, coastal waters are defined on the seaward side at a distance of 1 nautical mile from the baseline. For countries with islands that means 1 nautical mile from the last island. In such cases there could be a considerable overlap of related territory. In any case, the principle to be followed is “consideration of the wider covers the more restricted”.

Over the next decade, expanding economic activities in offshore areas, close to or further away from the coast, may result in the introduction of additional legal provisions for MSP, the coordination and integration of which already needs strengthening and better implementation within ICZM.

IWRM extends, theoretically, to the entire river basin. However, this area may be too extensive for an integrated plan for a coastal area, and therefore beyond scale for the effective application of management options. What is of paramount importance is to ensure the “integrity of the functioning” of the “last” downstream part of the river as the absolutely minimum area that an integrated plan should address. Upstream, partly cut-off, subsystems that function independently or in a semi-autonomous way, could be considered as inputs to the study system with limited further analysis. Based on the differentiated intensity management explained in 2.3, some basic conditions could be agreed with upstream communities/authorities/managers which will inform a broad framework for the management of the area in question. The major coastal part of the watershed, as presented in Figure 3.1, may be considered as a sub-basin of the river basin. In any case, it is necessary to respect the hierarchy of the system in order to achieve desirable harmonization of the goals between the river basin and the coastal sub-basin management.

From the ICZM point of view, geographical coverage is dealt with by Article 3 of the ICZM Protocol. This article defines the coverage at the seaward side of the coastal zone as the territorial sea. However, the integrated plan could also prepare for a small, more restricted coastal area, in which case the limits could be smaller than the entire territorial sea. As for the landward limit, the Protocol considers as adequate the limit of the competent coastal units. This may offer a pragmatic approach for certain coastal areas, particularly where the adjacent river basin is very extended, since it clearly refers/defines the authorities responsible for implementation of the ICZM, and therefore makes the plan more easy to handle.

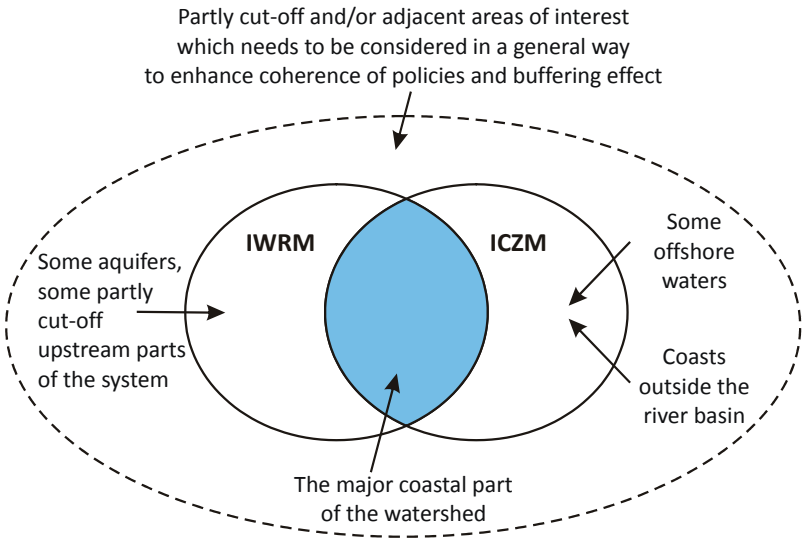


Figure 3.1. Integration and geographical coverage

Finally, at national, subnational and local level, the geographical coverage of a plan reflects, to a large extent, the governance, culture and competences in the country or region. The ICZM Protocol that, in principle, aims to cover the entire coastal zone of a country, provides for two approaches, either a top-down framework for the entire coastal zone or a bottom-up framework integrating ICZM plans of selected areas that may provide the nucleus and examples for progressive expansion to the entire coast.

Other adjacent areas of interest for the site in question (e.g. neighbouring wetlands, lagoons, small islands) may be considered broadly in formulating such a framework further and beyond the strict borders of the plan.

3.2 Integration across systems

The coastal zone and adjacent catchment areas frequently include a variety of terrestrial as well as marine, brackish and freshwater subsystems, surface and subsurface. Although these have distinctive functions and different properties they are closely interlinked and synergize with each other through natural processes, as well as through the service functions they provide. On these natural systems several man-made systems, tangible (e.g. towns) or intangible (administrations, culture) rely and often interact, at times harmoniously and at others aggressively and with tensions. Frequently, the more complex the clusters of natural systems, the richer is their biodiversity and the more valuable are the ecological services they offer.

The management of these physical systems (e.g. the terrestrial part which may have settlements, agricultural uses or sand dunes) is frequently under the responsibility/jurisdiction of ministries or other authorities that differ from those managing the brackish lagoons (where traditional aquacultures exist) or protected wetlands, deltas or the purely marine parts of the coastal zone.

A traditional IWRM plan is usually restricted to surface and groundwaters with little reference to brackish and marine systems. At present the impact of various pressures, such as groundwater over-abstraction followed by saltwater intrusion, directly and indirectly affects many systems and makes absolutely necessary the integration of management across systems on the entire coastal zone and, sometimes, even beyond. The most obvious example of integrated management being needed across a system that extends beyond the strict borders of the coastal zone is the case of the riverine systems. Management of the upstream parts is critical for the situation downstream (e.g. at the delta area), while pressures/consumption downstream may inhibit certain uses and allocations upstream, and *vice versa*.

Integration across systems is particularly noted and gains special importance when dealing with problems related to climate change and biodiversity. Without a full integration of all components and subsystems it will not be possible to solve these problems successfully.

The need to incorporate multi- and intra-/trans-disciplinarity is of fundamental importance to ensure the availability of competences and skills to work across systems, particularly when man-made systems (whether socioeconomic or intangible) interact with natural systems.

3.3 Integration across sectors

In most cases, a great number of important economic sectors and activities are active in the coastal zone and river basin and interact directly or indirectly. These may include urban and/or rural developmental activities, agriculture, aquaculture, fisheries, industry, tourism, transport and energy. All these sectors are attracted by the natural resources and opportunities of the coastal and adjacent river basin areas, and quite often are either in competition or in synergy over the use of the resources. Therefore environmental, economic and societal aspects of these sectors are mutually affected and interconnected, in positive or negative ways, and only an integrated approach can address their concerns and challenges, providing the optimum interaction to minimize conflicts, losses and adverse effects while enhancing benefits. For instance, two similar industries (e.g. iron and steel mills, one located directly on the coast and the other several kilometres from the coastline on a stream connected to the sea) cannot be dealt with differently under IWRM than under ICZM. Similarly, a series of production activities in the river basin, which result in products exported through the port located on the coast, require an integrated approach and management.

From most cases studied to date throughout the Mediterranean, the majority of the sectors present in the coastal zone and the river basin are common, with few exceptions (Figure 3.2). Closely and primarily related to the sectors (and only – to a lesser extent – on the prevailing geomorphological characteristics in the study areas) are the pressures and impacts exerted on the water resources and the coastal zone. In the majority of cases reviewed, these pressures are recognized as “common” and of comparable priority for both IWRM and ICZM approaches (e.g. agrochemical inputs through run-off are equally important if they come from coastal farms or from further upstream agricultural activities). Several of them give rise to pollution hotspots that are at the centre of attention of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities, the National Action Plans (NAPs) of the Mediterranean countries to reduce pollution and the Horizon 2020 Programme to de-pollute the Mediterranean by the year 2020.

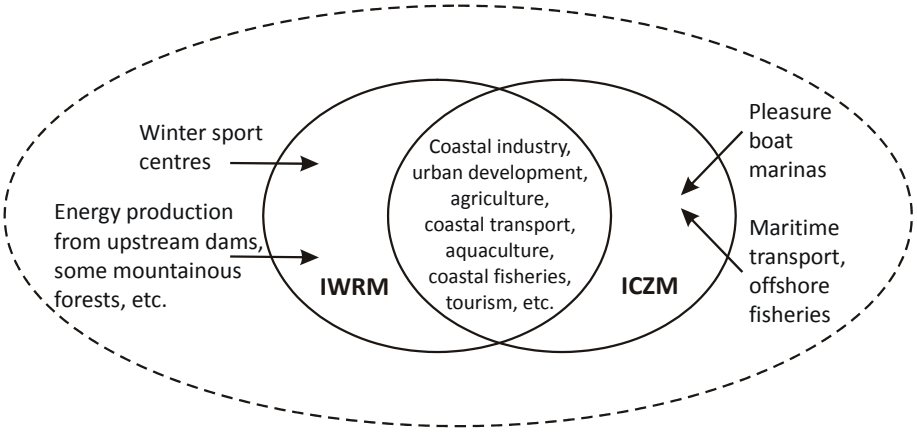


Figure 3.2. Integration across sectors

3.4 Governance for integration

Effective integration requires appropriate governance at the relevant national, subregional or local level. This relates to institutional structures and their coordination, as well as to various participation mechanisms.

3.4.1 Coordination of governance structures for integration

Governance is not only about distribution of power and decision-making but also includes administration, allocation and provision of means and services related to implementation of decisions, etc. It is exercised at various levels, national, subregional or local. Depending on the scope of an ICZM plan, the level of governance will be decided and the relevant administrations and partners/stakeholders will be involved.

In most cases ICZM plans are administered by ministries of the environment and/or physical planning. The same is true of IWRM plans in approximately one-half of the Mediterranean countries, while in the rest ministries of water (or agriculture, or water and energy, etc.) are responsible. The role of river basin organizations, wherever they exist, varies widely from country to country, including depending on their actual capacities. In both cases, coordination is supposed to include other competent national and regional services of ministries, for example mercantile marine, coastguard, tourism, agriculture, fisheries and interior, while economic ministries (e.g. of national economy or finances) are directly or indirectly involved on issues of regional development, taxation, fees, property rights, different aspects of security, compensation, economic tools, etc. (Figure 3.3). This type of integration is usually described as "horizontal" integration. Such integration is easy to recommend but difficult to obtain because in the majority of the Mediterranean countries administrations function, to a large extent, individually and in silos. In addition to horizontal integration it is also necessary to secure vertical, subnational, integration. This is not simple, either: it requires integration and coordination of the national level with the regional (prefectures, river basin organizations, etc.) and local (e.g. city councils) authorities of the area(s).

Article 7 of the ICZM Protocol requires that Parties ensure institutional coordination, through appropriate bodies or mechanisms, in order to avoid sectoral approaches, overcome administrative bottlenecks and facilitate comprehensive approaches.

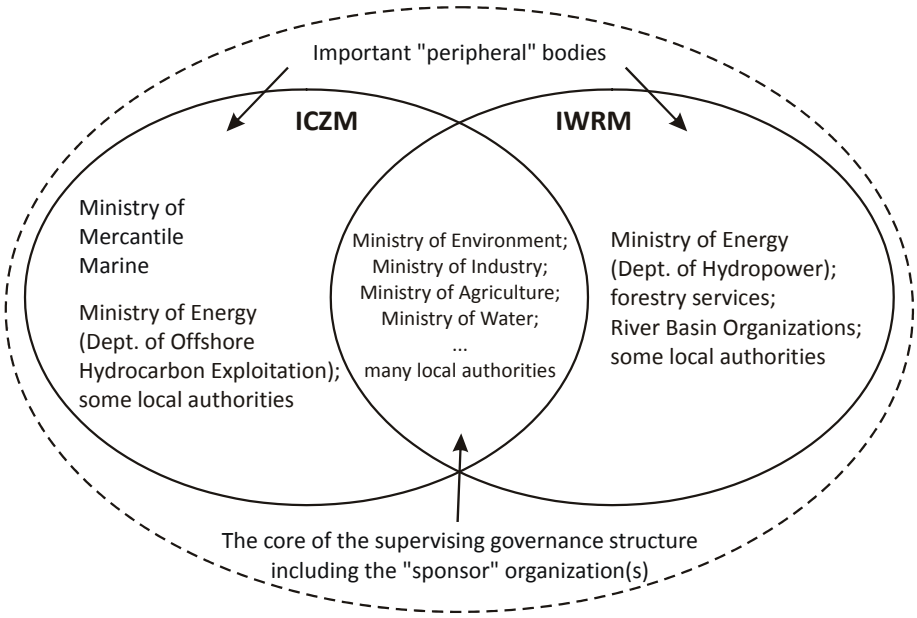


Figure 3.3. Coordination for integration

In Figure 3.3 different national authorities relevant to ICZM and IWRM are presented. A potentially suitable coordination structure for the integrated management plan has to bring together all competent authorities (core and peripheral) as well as other stakeholders. As presented in the second part of this publication, one way of dealing with this issue is to have a steering committee consisting of the core bodies, as well as a consultative group which may encompass all peripheral bodies involved. There are different variations and options possible with the involvement of permanent and ad hoc committees/bodies/councils. It is to be expected that a permanent body would have a much more significant and institutionalized role than an ad hoc body. Finally, the clarification of the TOR and role of such a body or bodies is of crucial importance for the successful management and SD of this area.

3.4.2 Participation for integration

In both ICZM and IWRM, appropriate participation and engagement of stakeholders are among the key principles and crucial factor for success. Article 14 of the ICZM Protocol is dedicated to participation, asking for appropriate involvement in the phases of formulation and implementation of the plans. Given the complexity and the diversity of the activities towards integrated management, all stakeholders should be involved. Representatives of the relevant ministries and regional or local authorities, river basin organizations and professional bodies/ chambers, etc., of the key sectors active in a focus area have to be involved. In addition, economic operators and civil society organizations (CSOs) such as national, regional or local environmental and users/consumers groups, irrigators and fishermen associations, hoteliers, industries, academia, NGOs, youth and women's organizations, etc., and the general public, must be included. In the vast majority of cases the relevant to IWRM and ICZM stakeholders – as groups and sometimes even as persons – coincide, perhaps with the exception of few experts/academics involved only for specific issues (Figure 3.4).

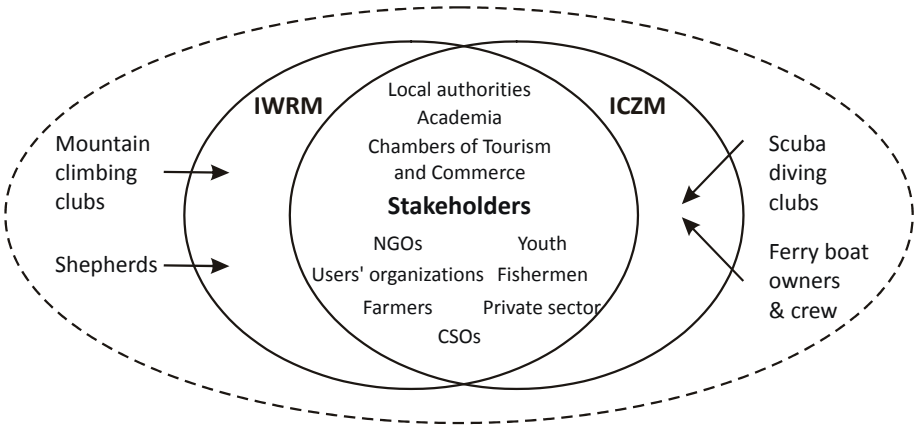


Figure 3.4. Stakeholders involved in integration

Much greater differentiations are expected from the professional and labour unions and particularly among some interest groups (proprietors of land, irrigators, etc.) between the coastal area and professions linked with it (e.g. fishermen, coastal hoteliers) compared with those from more upstream sites (e.g. farmers, shepherds or hydropower companies). However, considerable differentiation in synthesis or emphasis and priority of the various stakeholders involved is not associated entirely with the nature of the site or type of management (ICZM versus IWRM), but already exists within each of these management practices and is a very common issue particularly when dealing with water allocation in IWRM.

Sources of valuable input on participation aspects in implementation planning are derived from a recent report on implementation of the WFD, the most important conclusions of which are given in Box 3.1.

Box 3.1. Public participation in the EU WFD

In the context of the EU WFD, public participation (PP) is viewed as a means of improving water management through better planning and more informed decision-making. The active involvement of all interested parties and influencers in the deliberation and decision-making process is generally expected to foster an environment of accessibility, receptiveness and mutual respect that ultimately promotes transparency and trust among participants and can then increase the success rate of policies due to better acceptance by stakeholders. Naturally, this kind of setting is highly desirable, especially when the topic under discussion is a cross-cutting issue involving multiple stakeholders and reflecting numerous interests.

A review of the existing literature establishes the theoretical background and outlines the principal objectives of PP mentioned above, as well as the core principles that constitute a good participatory process: openness, protection of core values, speed and substance.

The review of the case studies showed that the institutional set-up, shared or ambiguous remits of authorities and the links between natural and administrative boundaries can all reduce the effectiveness of participatory processes. These elements should therefore be carefully considered and factored in, in order to plan River Basin Management Plans (RBMPs) effectively. Furthermore, clarity appeared to be key for achieving effectiveness, first in terms of describing how the participatory process is planned and conducted, including feedback on how the information gathered will be used. Second, clarity and tailored approaches are needed concerning the technical level (and language) of the information provided to participants. This also relates closely to the best practice of fostering transparency and a sense of ownership through clarity and early involvement, respectively. And finally, trust appeared to be vital for good PP. Good practice here meant having technical experts engage in face-to-face discussions, appointing independent facilitators and selecting tools targeting a specific audience.

The goal for PP is both involving members of the public and involving organized stakeholders. Involving organized stakeholders is as important for a good planning process as the involvement of the wider public which, in some cases, is even more challenging and needs appropriate tools and encouragement. There are already some good practices in that, such as the European Citizen's Initiative (ECI), which need to be further exploited.

(Adapted from the Executive Summary of the EEA Report 3/2014: Public Participation: Contributing to better Water Management)

3.4.3 Schemes of governance for integration

Well-defined governance structures improve integration processes by enhancing communication, establishing guidelines and policies, reducing and resolving conflicts, and fostering coordination and cooperation. The success lies in forging partnerships and linking initiatives in order to harmonize needs, expectations and initiatives, at the same time avoiding getting lost in complex structures, processes and overlapping administrations.

It is important to repeat that governance is fundamental to ICZM and IWRM since it allows an integrated and adaptive management approach. If we agree that the coastal zone needs to be approached in a holistic way (i.e. as a unique socioecological system governed by multiple links and interactions), adequate governance models could be found which are capable of responding to cultural, socioeconomic and environmental challenges with dependable solutions.

Various governance architectures are known and each situation will require a locally tailored and, in any case, nested governance approach. As one of the main common principles of ICZM and IWRM is the EcAp, it is expected that the existence of a governance mechanism covering the needs of both will contribute to the coherence between the policies, plans and programmes they rely on. It will also help in defining the competencies/roles, capacities and capabilities that the different stakeholders have in management, and will facilitate structured connections, sharing of

responsibilities and, when necessary, trade-offs (e.g. on cross-cutting responsibilities, missing or overlapping responsibilities and rights, conflicts).

To be efficient, governance provisions and structure(s) have to be designed jointly by a cluster of institutions and partners which decide what works best for them. Nevertheless, each structure should have, as a minimum, a document that sets forth its goals and objectives, establishes the decision-making process, confirms the commitment of partners and defines their responsibilities. Although it is normal and expected that major changes in policies and government schemes may affect management priorities in a given area, governance structures must be established in such a way that they are as robust as possible and are not abolished or lose their mandates by eventual changes in government, in partners' participation or through replacement of leadership. It is always an asset if in the governance structure committed partners and a "champion" leadership exists, ensuring coordination, continuity and smooth working relationships, to keep the integration efforts moving forward and to monitor progress.

3.5 Methodologies and tools for integrated planning

Different methodologies and tools are used for integrated planning. These could be clustered or specified according to the needs (e.g. for preparation, drafting, assessment/approval, implementation and monitoring/follow-up of the plans).

To a very large extent the methodologies used by ICZM and IWRM are common or very similar (Figure 3.5) and include:

- knowledge management, in general
- data collection (time series data) and assessments, including all kinds of qualitative and quantitative measurements of pressures, statistical information about socioeconomic and environmental trends (economic growth, population, consumption of water and energy, transport, housing, etc.; also education, social welfare)
- surveys and fieldwork/measurements for filling information gaps using a variety of methods and techniques, such as remote sensing and Geographic Information Systems (GIS)
- application of information sharing and communication tools
- enhancement of public participation (PP)/ consultation with stakeholders applying, inter alia, public consensus-building tools
- systematic use of indicators of performance (progress of implementation)
- systematic use of indicators of progress/results/ impacts/improvement of the situation (towards GES)
- establishing and utilizing various types of monitoring, employing the appropriate networks and agencies
- ensuring feedback and readjustment/adaptation mechanisms.

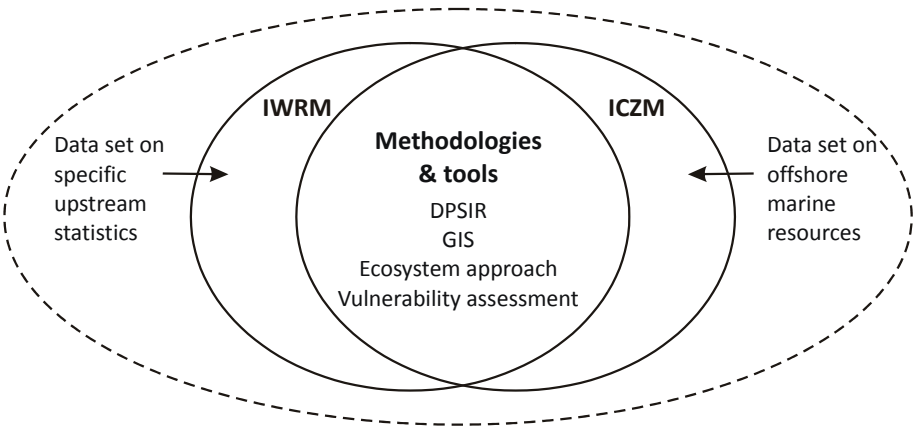


Figure 3.5. Methodologies employed for integrated planning and management

More on methodologies and tools appropriate for ICZM and IWRM will be provided in section II through the operational, step-by-step guidelines.

Lesson: convergence of approaches: a common definition of integration

The most important term within IMF is integration. As already explained in chapter 2, its common meaning is more often assumed rather than clearly defined, since there are frequently different interpretations, uses and applications of integration and integrated management. When approaching a particular case, it is important to define the spatial, political, socioeconomic, natural and technological context within which integration is implemented. The latter is not static but may be subject to frequent change.

The IMF identifies the key dimensions within which integration and integrated management must be defined. These are:

- Integration across commonly defined geographic space
- According to the IMF approach, the entire river basin should be considered. In practice, this depends on the specific size and geomorphology of the basin, but what should be included is the coastal sub-basin, with its groundwaters, transitional waters and coastal waters. Landward, the ICZM Protocol proposes the limit of the "competent coastal units". This offers a pragmatic approach for identifying the appropriate geographical coverage, particularly where the adjacent river basin is very extended, since it clearly refers/defines the authorities responsible for the implementation of the ICZM.

Experience from Buna/Bojana: boundaries – defining the transboundary plan area

The plan was defined according to guidelines in the ICZM Protocol and the EU WFD and the natural characteristics of the area, and refined according to local circumstances. A transboundary zone was made up of the transboundary natural elements, that is, coastal zone, catchment, aquifers, transitional and coastal waters – up to the external limit of territorial sea – and the relevant administrations (see Figure 3.6).

However, the plan is focused on a core zone within which the transboundary and land-sea interactions are concentrated. The boundary of this core zone is based predominantly on the watershed, aquifers and ecosystem of the Buna/Bojana and the inshore waters where the influence of the river system can be clearly identified and measured (see Figure 3.7).

In practical terms, the land boundary of the plan area was drawn using the local administrative boundaries that broadly conformed to the physical boundary of the watershed, thereby facilitating analysis of the natural and physical environment alongside the available socioeconomic information. In Montenegro this includes the municipality of Ulcinj, while in Albania this includes a number of communes within the county of Shkoder (Ana e Malit, Bërdice, Dajç and Velipojë). The approximate surface of the terrestrial part of the transboundary zone is 500 square kilometres (km^2).

The inshore marine zone was drawn according to the primary influence of the surface water flows on inshore marine waters, as indicated by the level of salinity (using the maximum sea surface salinity isolines to approximate average threshold at 35 PSU). This zone comprises approximately half of the national territorial waters.

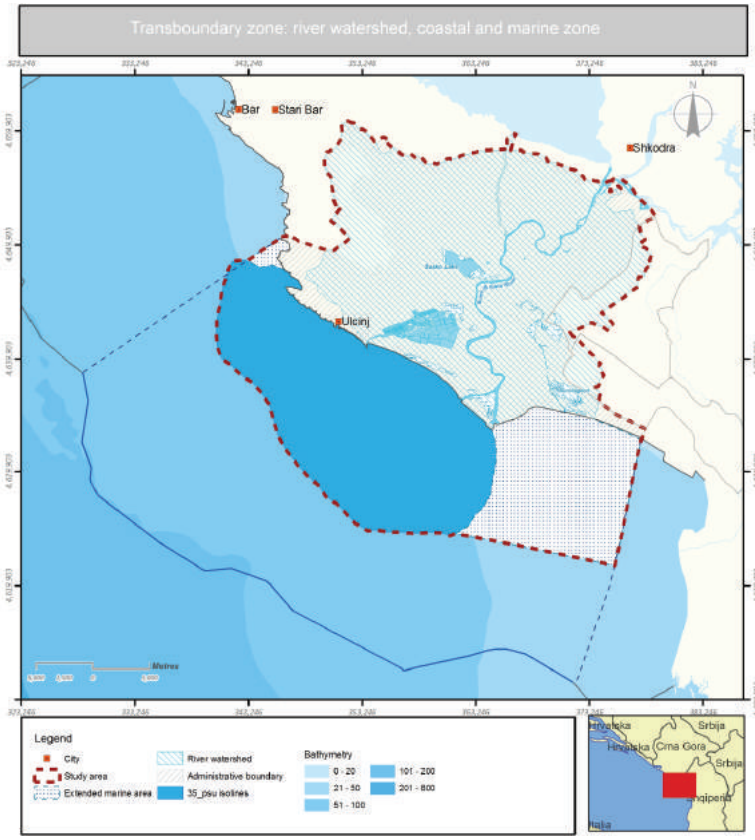


Figure 3.6. Transboundary zone: sub-basin, aquifer and marine zone

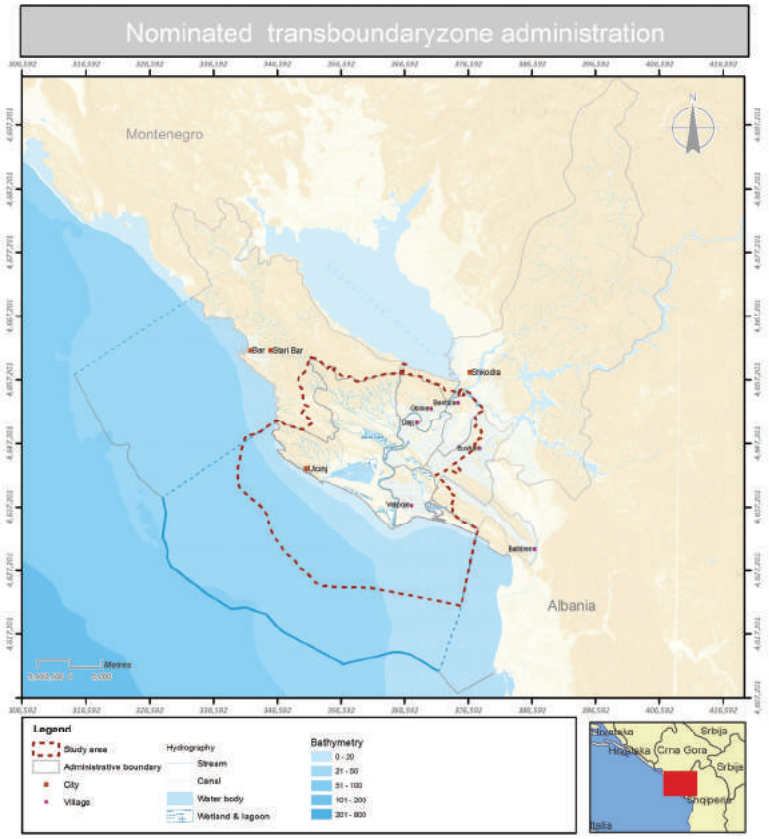


Figure 3.7. The core transboundary plan area

Integration across natural and physical systems

The natural and physical systems of the coast do not function in isolation. The impact of various pressures such as over-abstraction of groundwater is followed by saltwater intrusion and directly and indirectly affects many systems. The integration of management across the natural systems of the entire coastal zone and even beyond is, therefore, necessary. Management of the upstream, riverine parts is critical to the situation downstream, for example at the delta, while pressures/consumption downstream may inhibit certain uses and allocations upstream.

Integration across sectors

A wide number and various types of important economic sectors and activities are present in the coastal zone and the river basin and interact directly or indirectly. Such sectors include urban and rural activities and development, agriculture, aquaculture, fisheries, industry, tourism, transport, energy, etc. All these sectors are attracted by the natural resources and opportunities of the coastal and adjacent river basin areas, and quite often are either in competition or in synergy over sustainability of the resources.

Experience from the Buna/Bojana plan: upstream hydropower exploitation

Operation of the hydropower dams upstream of the plan boundary on the Drin River is focused on the maximization of electricity production. The dam's operation rules and practices do not take into consideration the risk of downstream flooding incidents in the event of extreme meteorological conditions. Therefore, the proper regulation of the dams through adaptation of the operational practices of this sector (including provisions for early warnings, cooperation with downstream communities and other sectors, etc.), is of critical importance for the reduction of hazards and effective management of water resources within the plan area.

Integration across systems gains special importance when dealing with problems related to climate change and biodiversity. Without a full integration of all components affecting interventions and all subsystems affected by them it will not be possible to solve these problems effectively.

Integration and governance

Effective integration requires appropriate governance at the relevant national, subregional or local level to achieve and promote it.

For the supervision of the planning process and, later on, for the implementation of the plan, there are various options for governance architecture, and each situation requires a locally tailored governance approach. They can range from permanent to ad hoc committees, bodies or councils.

Experience from the Buna/Bojana plan: the complexity of transboundary governance

Taking into account the importance of governance, the land boundary of the Buna/Bojana plan area was drawn using the local administrative boundaries that broadly (but not exactly) conform to the physical boundary of the watershed, and as a close approximation to the ICZM Protocol's definition of the coastal zone based on administrative units. However, the two countries have very different scales of local administration. In Montenegro, therefore, this includes only a single municipality, while in Albania this includes a number of communes within the wider county of Shkoder. Further, administrative responsibilities and capacities also differ widely. The experience indicates the practical realities of the use of administrative units. Plans must adapt to national and local circumstances, and the ICZM Protocol term "administrative units" may be on a scale that requires the drawing of coastal zone boundaries that encompass multiple small units or the subdivision of larger ones.

Experience from the Buna/Bojana plan: use of existing management bodies

Importantly, the plan governance structures established for plan preparation are likely to be different from those needed for its implementation, requiring a transition from the process of plan preparation to the process of implementation.

Integration for participation

In ICZM and IWRM the participation and engagement of stakeholders are identified as key principles and crucial factors for success. In the vast majority of cases, relevant IWRM and ICZM stakeholders – as groups and sometimes even as individuals – broadly coincide.

Experience from the Buna/Bojana plan: participating bodies

Most of the bodies competent for ICZM in the Buna/Bojana area are common with those responsible for and interested in IWRM.

Chapter 4:
Foundation Documents for IMF

Plans for coastal areas including estuaries within the Mediterranean should be developed within the context of the ICZM Protocol and IWRM principles. An institutionalized approximation of such an approach is also provided by the EU WFD. The latter is obligatory only for EU Member States while its provisions are voluntarily followed by Accession States. However, some other Mediterranean countries follow also its principles which, in any case, may be used as inspiration towards IWRM.

4.1 ICZM Protocol

The ICZM Protocol adopted in 2008 was the 7th Protocol in the framework of the Barcelona Convention, and represents a major milestone in the history of the MAP. It completes the set of protocols for the protection of the marine and coastal environment of the Mediterranean region and it is hoped it will help Mediterranean countries to better manage and protect their coastal zones, as well as address newly emerging coastal environmental challenges, such as those linked with climate change.

Ultimately, the ICZM Protocol identifies a hierarchy of a Mediterranean ICZM strategy, national strategies and coastal plans and programmes for individual coastal areas (including transboundary ones; Box 4.1).

The ICZM Protocol sets an ambitious framework and "qualities" of ICZM plans, which should be:

- Innovative
- Forward-looking and proactive – preventing and not only reacting to coastal problems
- Comprehensive – covering all issues crucial for coastal environment (marine and terrestrial) and its protection in the twenty-first century
- Integrated – ensuring institutional coordination, cooperation of national, regional and local authorities, involvement of partners/stakeholders (includes NGOs and other competent bodies).

Box 4.1: General principles of ICZM (Article 6)

a) The marine and land part of the coast should be taken as a single entity.
b) All elements relating to hydrological, geomorphological, climatic, ecological, socioeconomic and cultural systems shall be taken into account in an integrated manner.
c) The ecosystem approach shall be applied.
d) Appropriate governance allowing adequate and timely participation in a transparent decision-making process shall be ensured.
e) Cross-spectrally organised institutional coordination shall be required.
f) The formulation of land use strategies, plans and programmes covering urban development and socioeconomic activities and other sector policies shall be required.
g) The multiplicity and diversity of coastal activities shall be taken into account and priority shall be given to public services and activities requiring the immediate proximity of the sea.
h) The allocation of uses should be balanced and unnecessary concentration and urban sprawl should be avoided.
i) Preliminary assessments shall be made of the risks associated.
j) Damage to the coastal environment shall be prevented, and where it occurs, appropriate restoration shall be effected.

The presumption in the General Principles of the Protocol (article 6) is that all sectors are of equal importance in the EcAp, achieving the optimal combination of the approaches within a common spatial and temporal context. Plans for coastal areas should therefore reflect the aspirations and interest of all sectors in a balanced way. Where plans are produced with the involvement of several sectors, a clear foundation statement should be made through the process, which expresses the shared vision of working together; the main objectives and commitments of partners; and an outline of key operational directions. Such vision should be ambitious and not a mere compromise based on a common denominator approach among sectors.

The larger macro- or high-level elements of policy could be abstracted from policies or strategies concerning individual sectors and cross-cutting themes. What should be examined and enhanced are the interrelationships/communality between them, along with the existing operational policy means and the consolidated actions. Sectoral integration should achieve optimal solutions rather than mere compromises or distortions due to different institutional and/or funding priorities.

The scale and nature of an ICZM plan or programme may vary from case to case. According to article 18, paragraph 3 of the ICZM Protocol for the Mediterranean: "Coastal plans and programmes, which may be self-standing or integrated in other plans and programmes, shall specify the orientations of the national strategy and implement it at an appropriate territorial level, determining, inter alia and where appropriate, the carrying capacities and conditions for the allocation and use of the respective marine and land parts of coastal zones."

4.2 WFD

In 2000, the EU adopted the WFD which introduces a new legislative approach to managing and protecting water, based not on national or political boundaries but on natural geographical and hydrological formations: river basins. It also requires coordination of different EU policies, and sets out a timetable for action, with 2015 as the target date for getting all European waters into good condition. The EU established a 6-year planning cycle for the development of RBM plans, and the first are to be reviewed in 2015. Box 4.2 summarizes some key principles of the WFD.

Box 4.2: Some key principles of WFD for IRBM

Objective: achieving "Good Status" for all EU rivers, lakes, groundwaters, coastal waters, etc., by 2015.

Establishing a 6-year planning cycle for the development of river basin management plans.

First review to take place in 2015.

The WFD:

- aims to protect all waters, surface and groundwaters
- aims to cover all impacts on waters
- comprehensively defines water quality in terms of biology, chemistry and morphology
- bases water management on river basins
- provides for monitoring programmes on surface and groundwaters, both as planning tools and as assessment instruments
- considers economic instruments (getting the prices right to promote prudent use of water)
- introduces mandatory public participation
- is complemented/guided by an enhanced cooperation on implementation
- aims to reduce marine pollution from land-based sources and protect ecosystems in coastal waters.

EU Member States have had to draw up river basin management plans (RBMPs) to safeguard each of the 110 river basin districts of the EU. The EU now has more than 127,000 surface water bodies: 82 per cent of them rivers, 15 per cent lakes and 3 per cent coastal and transitional waters. The same river can contain different water bodies, since the status of the water may change. The total number of groundwater bodies reported is 13,261 (Commission Staff Working document, available at http://ec.europa.eu/environment/water/water-framework/pdf/CWD-2012-379_EN-Vol1.pdf).

PP is a fundamental principle in this process, so European citizens are expected to play an influential role in planning and implementing the WFD measures.

The WFD introduces a series of important criteria and classifications. The ecological status looks at the abundance of aquatic flora and fish fauna, the availability of nutrients and aspects such as salinity, temperature and pollution by chemical pollutants. Morphological features such as quantity, water flow, water depths and structures of the river beds are also taken into account. The WFD classification scheme for surface water ecological status has five categories: high, good, moderate, poor and bad. High status means no or very low human pressure; good status means a slight deviation from this condition; moderate status means a modest deviation, and so on.

To define good chemical status, environmental quality standards have been established for 33 new and eight previously regulated chemical pollutants of high concern across the EU. The WFD is backed up by other EU legislation such as the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) regulation on chemicals and the Directive for Integrated Pollution and Prevention Control (IPPC) for industrial installations.

The rules for groundwater are slightly different and good chemical and quantitative status is the objective. Member States must use geological data to identify distinct volumes of water in aquifers, and European law limits abstraction to a portion of the annual recharge. Groundwater should not be polluted at all – any pollution must be detected and stopped.

Under the WFD, Member States have to hold extensive consultations with the public and interested parties, first to identify the problems, and then the solutions, to be included in RBMPs. Box 4.3 presents the WFD requirements for PP. Finally, WFD also addresses the changing environment which creates challenges for the future, including climate change, floods and droughts.

4.3 Groundwater directive

The EU Directive “on the protection of groundwater against pollution and deterioration”, while not specifically mentioning coastal aquifers and their particular set of groundwater-related problems, provides general criteria for the assessment of good groundwater chemical status and for the identification and reversal of significant and sustained negative trends. It also complements the provisions already in the WFD that prevent or limit inputs of pollutants into groundwater.

4.4 Additional documents to be considered

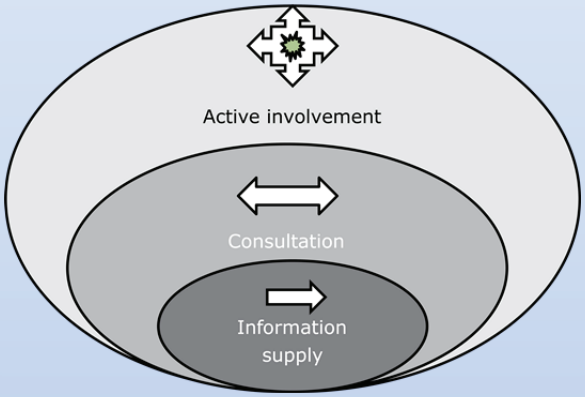
In addition to the two basic documents already mentioned that support the IMF and all elements and lessons that can be deduced from the other integrated (targeted) management approaches, one should consider some important inputs from other legal documents such as:

1. The EU MSFD which – to a large degree – covers the extension of management beyond the transitional waters to the marine environment and maritime activities and which constitutes a compulsory framework for EU Member States
2. IMP, overarching EU strategy for a coherent approach to maritime issues, with increased coordination between different policy areas
3. MSP (linked to point 2, above)
4. The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) which has been signed and ratified by many Mediterranean countries

5. The Protocol on Water and Health (1999) under the UNECE Water Convention, also ratified by many Mediterranean countries
6. The Model Provisions on Transboundary Groundwaters (2012) under the UNECE Water Convention which provide guidance for the implementation of the Convention to transboundary groundwaters (based on the draft articles on the law of transboundary aquifers annexed to United Nations General Assembly Resolution 66/118)
7. EU White Paper – Adapting to Climate Change
8. EU Flood Risk Directive
9. A series of other conventions (such as Ramsar, CBD, etc.) to be taken into account in the relevant parts of the integrated plans
10. Mediterranean Strategy for SD (MSSD)
11. EcAp process in the Mediterranean.

Box 4.3: WFD requirements for PP (EEA, 3/2014)

The WFD requirements for PP are explained here as a three-level process. The groundwork required or precondition for PP is information supply. This first level should provide the public with the knowledge and background documents necessary to take part in the process. According to the EU Guidance document on PP in relation to the WFD, "as a minimum the background documents should include all the documents that are summarized in the River Basin Management Plan".



Three levels of public participation, after WFD Guidance document No 8 Common Implementation Strategy (CIS) Working Group 2.9, 2003

Consultation is the second level of PP: this consists in making a document available to the public for their comments and ideas, based on their perceptions and experiences. This can be executed in written or oral form, and can be conducted passively (an open invitation to participate is extended) or actively (opinions are requested directly through surveys, for instance). In a consultation, the party requesting opinions is not bound to integrated them into the outcome, and the public does not play a decision-making role.

The third level of PP is active involvement, which is a higher level of participation than consultation. Active involvement implies that stakeholders and the public are invited to contribute actively to the planning process by discussing issues and contributing to their solution (CIS Working Group 2.9, 2003). The CIS Guidance document on PP, the whole process of the WFD common implementation and numerous examples in the literature suggest that active involvement of a wide range of stakeholders facilitates achievement of WFD objectives and improvement of our water environment. When preparing the first draft RBMPs, initial steps for active involvement of all interested parties often consisted in the setting-up of working groups with a predominantly advisory role, involved directly in the drafting of plans, or consulted afterwards (Kampa, 2009, referenced in EEA, 2014).

Section II:

Operational Guidelines of the IMF

Chapter 5:
Planning Process and its Five Stages

5.1 Introduction

There is no single recipe for preparing an integrated plan because there are numerous opportunities for starting points and methods to be followed depending on the site, its history, previous management efforts and the political and socioeconomic circumstances. There is a wealth of planning experience under a variety of names and frameworks, the most important of which have been presented in section I and were of particular usefulness for the design of the present section. Many elements and components need to be synthesized. In fact, after reviewing a considerable number of IWRM, ICZM and other types of integrated plans, SD plans, and relevant strategies, projects and schemes proposed in the literature and applied to date, we are in a position to broadly describe and propose a logical sequence of key stages that seem to be both essential and practical for the preparation/drafting of plans.

5.2 Overview, dynamic nature of integrated plans, the DPSIR framework and timeliness

It is very important to understand the various stages or phases of planning to be presented in chapter 6 not as discrete steps but as parts of a continuum which is enhanced by multistage feedback. The latter, if successful, could lead to a virtuous cycle of improvement, deepening and (depending on need) adding details without, however, becoming involved in describing micromanagement which may soon become obsolete. Furthermore, provisions should be in place to allow the results of scientific research and studies related to biogeochemical processes in the region – as well as on socioeconomic, cultural, etc., aspects and developments – to inform and improve management.

5.2.1 The DPSIR framework

A very instructive depiction of the dynamic nature of planning and the close relationship of the integrated plan with the policy cycle is the DPSIR sequence or framework developed by the European Environment Agency (EEA, 1969). It is a descriptive, simple and flexible cause-consequence loop which illustrates the links between human activities and environmental processes. It has been widely used in environmental research and communication, as it helps stakeholders to understand the importance of natural systems in the decision-making, as well as the repercussions of economic activities (Figure 5.1).

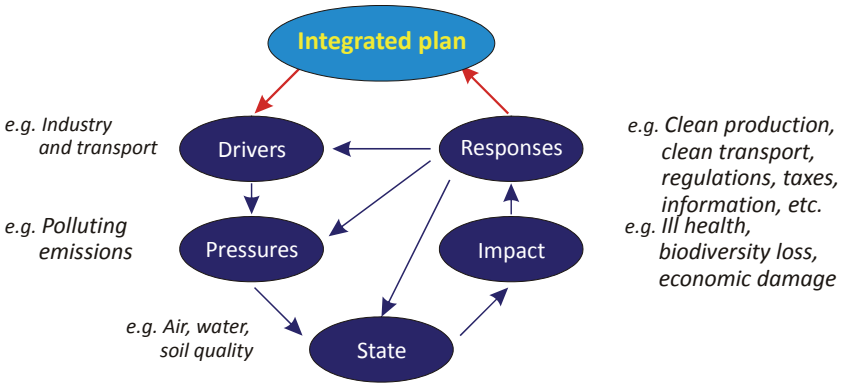


Figure 5.1. DPSIR Framework informs the preparation of the Integrated Plan

The DPSIR framework, even if it might sometimes be disturbed by unexpected external parameters, indicates that the initiation of an integrated plan corresponds to the responses phase of a well-documented and communicated cycle where the pressures and impacts are well understood and therefore there is adequate public support or even demand for a coherent strategy to address the problem. Therefore, during the analysis stage, drivers, pressures, state and impact should be documented, analysed and understood. However, feedback, monitoring and appropriate adaptations should be considered as an integral part of the overall process of plan preparation and implementation.

5.2.2 Timeliness

The DPSIR framework may also be useful in obtaining optimum timeliness". Timeliness refers to identification of the appropriate moment for the introduction of an integrated plan. Engagement of the various stakeholders and local society at large, in particular, and also the chances for introduction of institutional changes and legal provisions or funding opportunities, etc., are not time-neutral. There are some specific moments that are more favourable than others for initiating or implementing such plans; these are normally linked with the development and individual stages of the DPSIR policy cycle.

5.3 The Seven I's

In approaching integrated planning one should also remember that integration is only one of the important "Seven I's", which are all relevant for the planning process and for follow-up. They should be taken into account from the design phase; and, while implementation may be considered as the final aim, and integration as the process of obtaining it, information, involvement of stakeholders, innovation, investment and international experience-sharing and cooperation are all-important tools in achieving both, as shown in Figure 5.2.

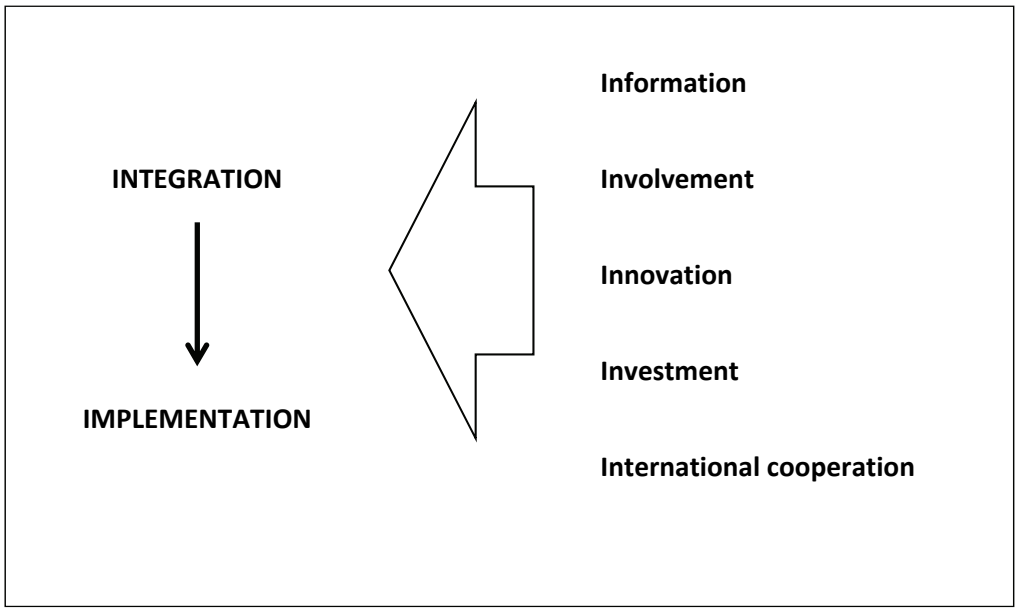


Figure 5.2. The Seven I's

5.4 Practical suggestions to enhance the multiple usefulness of the plan

In elaborating and implementing truly integrated plans, three clusters of actions should be considered:

1. Planning by keeping in mind the inclusion of "no-regret measures", several of which have been identified by local communities or scientists (e.g. by avoiding building infrastructures in vulnerable areas, by giving preference to low energy and reduced material demand options, by promoting waste recycling options)
2. Using nature, ecological services and natural capital in an appropriate way as capital and service (see relevant chapters) by enhancing the functions of natural regulation systems (e.g. by re-naturalizing areas that could act as natural buffer or detention zones, such as transitional and intermittent wetlands for absorbing flood pressures, tsunamis, pollution). This is the main message of the EcAp.
3. Securing/preparing/providing both technical and human resources for adaptation to climate variability and change; and to increase the robustness and resilience of the systems involved to climate change and also to emergencies and extraordinary events of whatever nature. This also includes elaboration and testing of contingency plans, trainings and early warning systems, and also putting in place relevant facilities (e.g. high-capacity removable pumps), which could provide exceptionally useful services at difficult times and enhance the efficiency of the operation of an integrated plan.

All the above are also important in plans related to adaptation to climate change.

5.5 Schematic representation of the planning process

In order to achieve integration, a planning process is suggested within IMF, to guide the step-by-step preparation of the plan, and identify the issues for permanent and focused integration of coastal, river basin and aquifer/groundwater management. The guidelines that follow are structured into five sections representing the five stages of a planning process within which the ICZM ingredients are combined with those of IWRM, coastal aquifer and groundwater management, the EcAp principles and several other important inputs. More specifically, this process was developed by taking into account the experience of several PAP/RAC Coastal Area Management Programme (CAMP) projects and a methodology, introduced under the EU-funded SUDECIR programme (Scoullos *et al*., 1999). The programme was implemented with emphasis on tourism on the island of Rhodes, Greece (Scoullos, 2004), and more recently on Lake Bizerte, Tunisia, within the framework of Horizon 2020, obtaining an agreed plan/framework (www.h2020.net/news-and-events/news/107-ceremony-for-the-signature-and-adoption- of -the- charter- for- the- sustainable-development-of-lake-bizerte.html; and www. h2020.net/ news- and- events/ news/ 95- the- lake-bizerte- charter- a- step- towards- its- sustainable-development- horizon- 2020- enhances-stakeholder-participation-for-the-integrated-management-of-lake-bizerte-in-tunisia.html) (Figure 5.7) as well as a series of good practices on IWRM plans accumulated in the GWP Toolkit (www.gwp.org/ ToolBox) and through the work of the EU FP7 PEGASO project (www.pegasoproject.eu) (Figure 5.3).

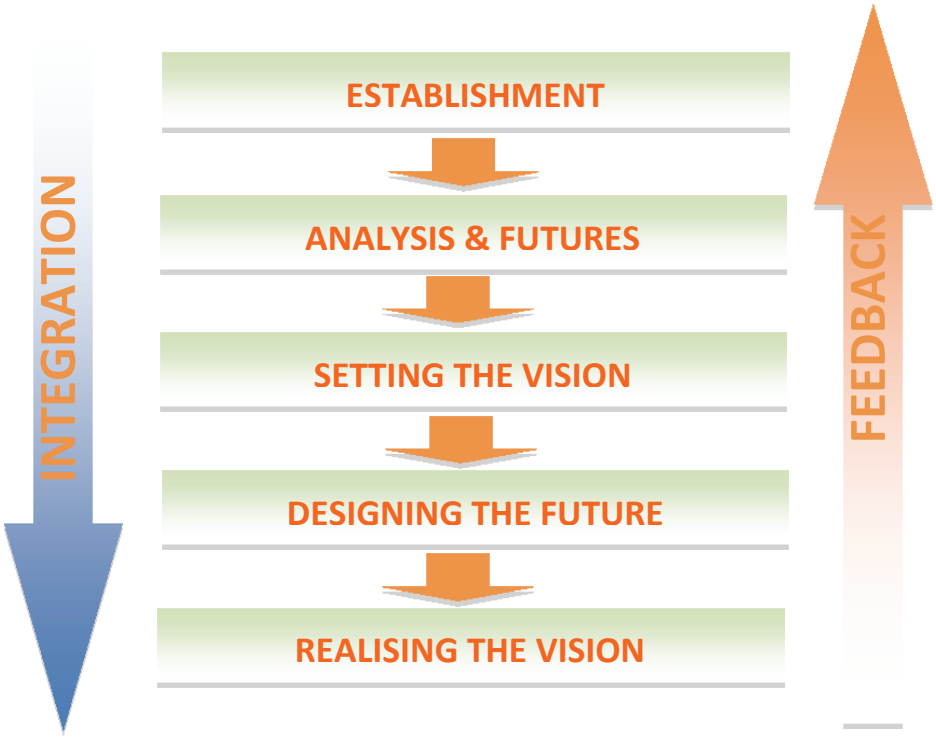


Figure 5.3. Plan preparation and implementation process: overview

5.6 Proposed sequence of the five stages

As mentioned already, there are many ways to design, draft and present a planning process and even more ways to systematically depict it. This depends on where the emphasis is placed. Planning includes both "substance" in the content of each stage and "process" which is dynamic. If the broad content of each stage is the main purpose of the document, the schematic representation of the planning can be simple and relatively linear. If the emphasis is on explaining the process itself with some accuracy, the representation becomes more complex and cyclic.

It is of crucial importance to understand that the stages cannot be developed separately, in isolation, without overlapping and without feedback. Linear representations of the stages of the process should be understood as including dynamic internal interaction among the various stages but also within each one of the stages. Figure 5.4 depicts an overview of the plan preparation and implementation process in a rather abstract, simplified, linear way. The sequence of the stages is very clearly presented and the arrow on the left emphasizes the gradually increasing degree of integration obtained with time and further elaboration of the plan. The arrow on the right indicates the expected and needed feedback during the preparation and, most importantly, during the implementation of the plan.

The triggers for the initiation of the plan may be different: legal requirements (such as the ICZM Protocol, WFD norms or some other international or national legal requirements); escalation of problem in need of solution; new developments representing opportunities for some more sustainable approach; or opportunities provided through international donors, etc. The timeliness of the initiation as part of the response in the DPSIR framework has been explained already above (under 5.2.1).

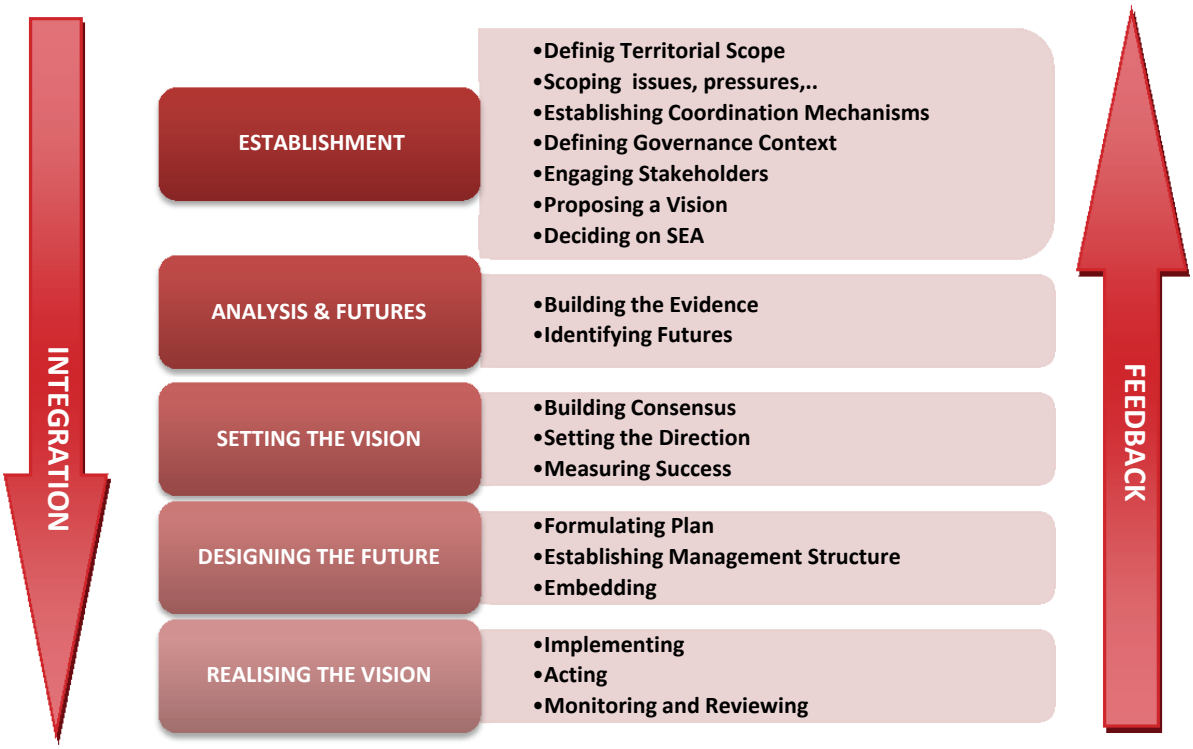


Figure 5.4. Plan preparation and implementation process: detail

The five-stage process is described in these guidelines in detail. Each stage includes a number of tasks and each task a series of steps, actions and deliverables/outputs.

When getting into the planning process the systematics and sequence of the various steps may be differentiated according to local, site-specific conditions, opportunities and well-established or emerging priorities.

In some cases, the initial description of the process based on superficial analysis of the situation is incomplete and the actual process becomes far more complex than expected. In other cases, the complete process described might be "maximalistic", ideal or unnecessarily complex. In fact, in some cases the description on paper may be more complicated and difficult than it is in practice.

In view of the above observations, some things should be understood properly right from the beginning. Even if the process is a rather long and complex, the final product (the integrated plan) should be basically simple and relatively brief but not superficial. Both the plan and the planning process, apart from describing and analysing the specific issues of interest to the specific site and reflecting/respecting the consensus vision about the future of the plan area, should also:

- create the enabling working framework for different organizations, disciplines, authorities and stakeholders to cooperate
- succeed in positively influencing the behaviour of target user groups and institutions including the various donors and investors
- lead to tangible results and visible benefits, obtaining an appropriate balance between environment and human society
- be holistic and not sectoral, and not "captured/hostage" or unduly influenced by a single economic sector (e.g. transport/tourism/ agriculture) or centred on a single problem (e.g. nature conservation, soil erosion)
- be based on targets tested and applied somewhere else
- find a balance between ambition and realism (overcome obstacles and bottlenecks but remain "doable").

Lesson: Operational practicalities – the value of the simple, common road map adaptable to local circumstances

In order to achieve integration, a planning process – the simple five-stage road map - is proposed by the IMF to guide the step-by-step preparation of the plan and deliver its outcomes, and to identify the issues for the focused integration of coastal, river basin and aquifer/groundwater management. It is meant as a guide and is adaptable for use at local level, according to local circumstances and resources.

In the review of existing planning process methodologies around the world, clear commonalities were identified – the broad stages of analysis through to realization of the plan, and its subsequent monitoring and review. However, many these processes are described in ever-increasingly complex language and organograms. Methodologies are often described for a technical audience, over-concentrating on a predominantly scientific analysis. Issues are selected for management on a top-down basis that more closely reflect the objectives of the project proponents than the community on the ground. Often the methodologies do not fully recognize the realpolitik of work at a local level, the limitation of resources and the all-important plan-delivery stage. Thereby these complex methodologies prove difficult to translate into a practical planning process for application at the local level.

The guidelines for the IMF are therefore deliberately simple and structured into clear sequential sections: establishment; analysis and futures; setting the vision; designing the future; and realizing the vision representing the five key stages of the planning process. They are firmly based on Mediterranean experience (Scoullos, 1999; Vonkeman, 2000).

Emphasis is based on four key principles that recognize the limitation of resources, the need to engage non-expert audiences and, ultimately, that lead to real outcomes. These principles are:

- the establishment of a firm foundation at the beginning of the process and before the "scientific" analysis – including, for example, developing the workplan, scoping the local issues and agreeing the plan boundaries
- the development and use throughout of a shared common vision for the plan area
- the pragmatic use of "fit-for-use" data and information rather than over-complex research and analysis, combined with the use of clear, non-technical language
- the focus on delivery – agreeing a commonly agreed vision for the plan area and providing the foundations for delivering real outcomes.

The diagram in Figure 5.5, which illustrates the process, appears almost naïve in its simplicity and linearity. This is deliberate, as it provides a framework around which to design a rigorous intellectual process of analysis and planning, a simple structure upon which to "hang" deadlines and targets, and through which to allocate financial and human resources during the planning cycle.

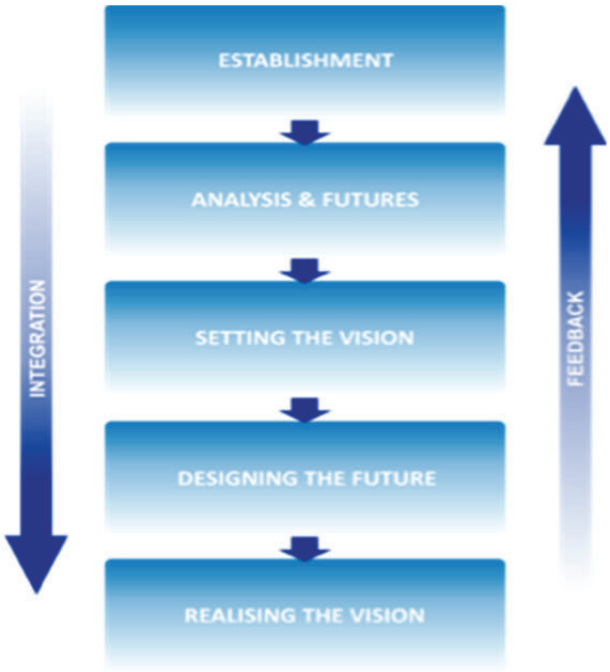


Figure 5.5. The five stages as described in the Buna/Bojana integrated plan

The diagram also acts as a convenient "top layer" for use in a web environment. The process was developed in parallel with the EU FP7 PEGASO project, the main goal of which is to construct a shared ICZM governance platform for the Mediterranean and Black Sea linked with new models of governance for the Mediterranean and Black Sea. The IMF process is used as the framework for "Roadmap towards Coastal Sustainability" – an online wiki through which each of the five stages can be explored and infinitely expanded in ever greater detail (Figure 5.6).

In Lake Bizerte, the SUDECIR (Vonkeman, 2000) approach was applied. The analysis part, which corresponds to stages 1 and 2 of IMF, was largely carried out by H2020, Mediterranean Hot Spots Investment Programme – Project Preparation and Implementation Facility (MeHSIP-PPIF) and the European Investment Bank (EIB). This was followed by the agreement by consensus of the Bizerte Charter which represents the collective vision, facilitated by H2020 Capacity-Building / Mediterranean Environment Programme (CB/MEP) (www.h2020.net/resources/training-materials/finish/192/1712.html).

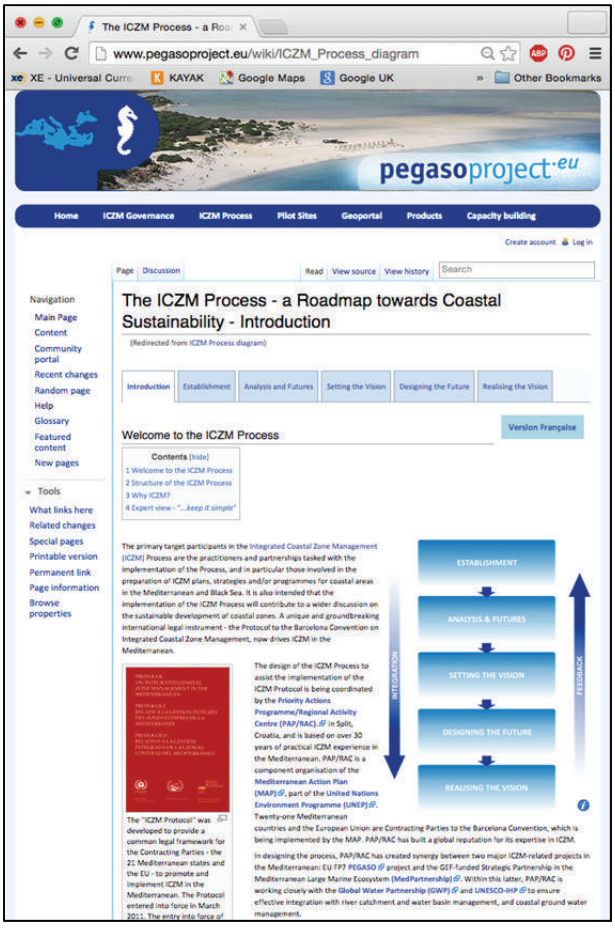


Figure 5.6. The "Roadmap Towards Coastal Sustainability". Extract from the PEGASO project website (www.pegasoproject.eu) demonstrating the use of the five-stage process in ICZM

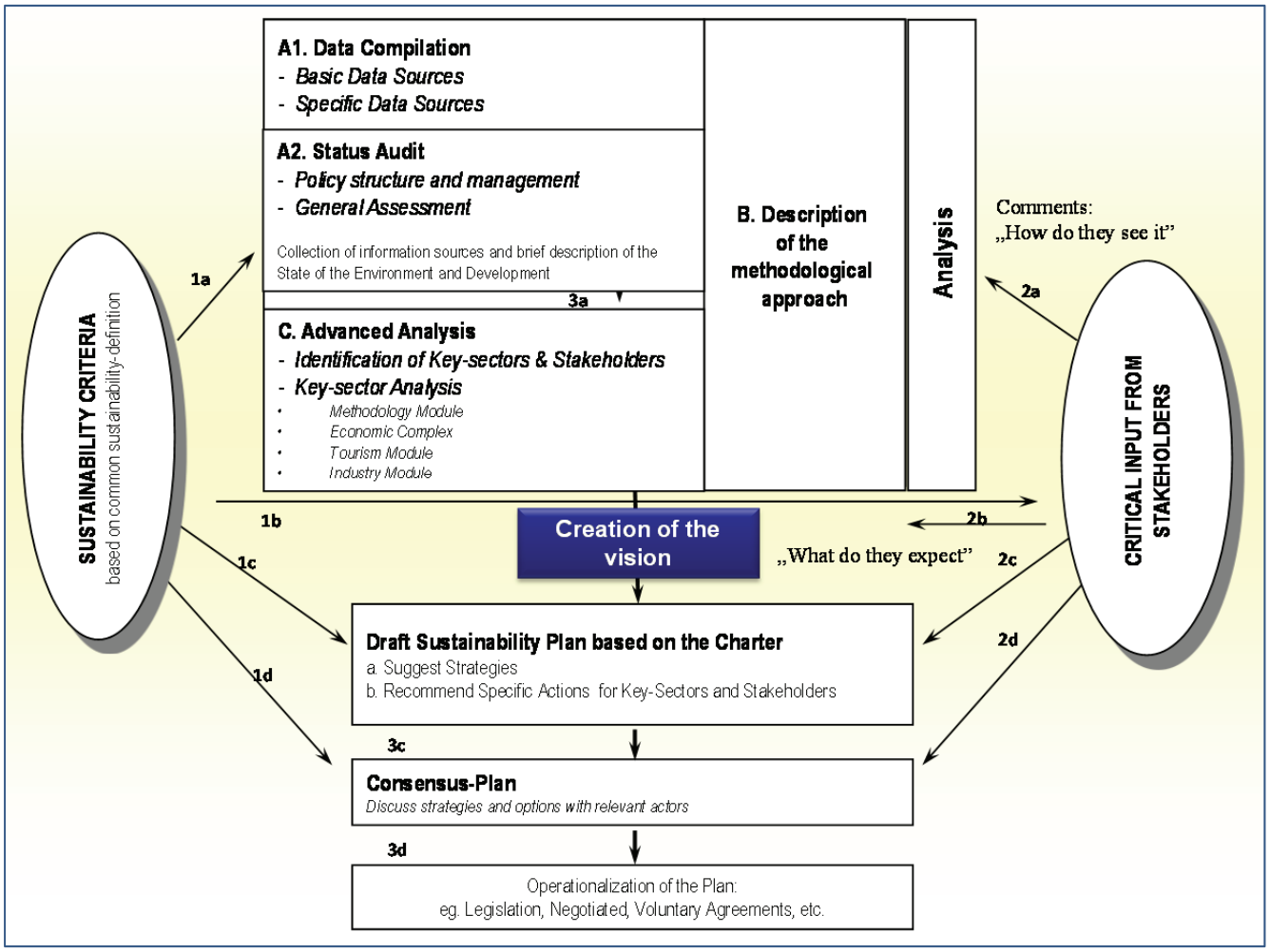


Figure 5.7. Process diagram for Lake Bizerte, applying the SUstainable Development for CIties and Regions (SUDECIR) approach

Chapter 6:
Stage 1 – Establishment

6.1 Aim and objectives

The overall aim and objectives of the establishment stage is to define/make known the intention for drafting the plan and identify the convening authority/the initiator authority or body responsible for the overall coordination of the planning. All parties who should be involved from the state, regional or local authorities and stakeholders should be identified, and an operational foundation established for the subsequent preparation of the plan and its implementation. The core group or task team (different names are in use) generates the process of understanding the challenges facing the area, including the differences in perceptions of those challenges, and begins building a constituency of support for the plan.

In the initiation step efforts should be focused on clarifying what the mission context and mandate are. Who is asking for the integrated plan? Which authority will lead and take the main responsibility for the plan? To what extent and how will ICZM, IWRM, aquifers, etc., be integrated? What statutory/conventional purposes or obligations towards international conventions will the plan serve or may cover? What are the likely driving forces to support the planning process? What are the available time and financial frameworks within which the plan should be delivered? All major partners interested in plan preparation should be identified, informed and agree in principle on the most appropriate/desirable final legal status of the plan, particularly when this plan is intended to meet the statutory purposes of more than one sectors. All relevant national, regional authorities should be aware and, if possible, signed up to the preparation of the plan and help to identify and agree on the body or bodies responsible for its adoption as soon as possible. All the above could be eventually put in a first document, a so-called foundation statement, issued by the convening/initiator authority, sometimes co-signed by other key partners.

In the same step, coordination mechanisms for the planning process (steering group or committee, the core group or task team, the technical group and/or the consultative group) will be established with provisions for amendments and inclusion/ cooperation/co-option/ employment of other parties, as necessary. Depending on the site and scale of the undertaking, the steering committee and the core group /partners may or may not coincide.

It is not the intention or purpose of this stage to achieve a fully detailed scientific analysis of the state of the plan area or the complex interrelationships between issues. Rather, the purpose is to specify the system, achieve a picture of the likely range of human and natural forces, the existing sectoral policies and plans, as well as their potential interrelationships to be used as a focus for discussion, challenges, opportunities, analysis and the identification of priorities in subsequent stages.

At this early stage, effort should also be directed to creating tools for engaging stakeholders through good design of process and the supporting documents in non-technical language and employing appropriate media.

6.2 Key tasks

1. Defining the initial territorial scope by identifying the boundaries of the specific plan area and the ecosystems involved
2. Scoping of the major river basin issues
3. Defining the governance context
4. Engaging stakeholders and preparing communication strategy
5. Proposing a potential vision for the plan area
6. Deciding on strategic environmental assessment (SEA).

The key tasks are not necessarily performed in the order outlined above; they can also run in parallel. A workplan should define the appropriate timing for each task.

6.3 Potential outputs

Depending on the type, scale and magnitude of the undertaking, an inception report (including the workplan) and/or a scoping report may be needed. These may be combined into a single document/report.

6.3.1 Inception report

The inception report should be agreed among the core partners in the planning process to include:

- Background and purpose of the project, including the trigger factors/driving forces for the process (the trigger may be a political decision, a strategic priority or a response to a specific local problem or issue)
- Potential framework of focus issues towards a shared vision; this should be generated through a combined top-down or bottom-up process
- The operational policy means of delivery, funding and consolidated actions
- The geographical boundaries of the plan area including both the terrestrial and marine boundaries (system concept)
- External influences (challenges and opportunities)
- International and/or national context, including the relevant legal and strategic context and parameters of the process
- The governance and the proposed coordination structure, in the form of the steering group or committee, including its objectives, tasks, TOR/mode of operation, etc.

6.3.2 The workplan

The workplan is a constituent part of the inception report. It should clearly detail the tasks and milestones of the process and the allocation of responsibilities among partners, along with the logistical structure for technical and administrative support. The objective of the workplan is to ensure the smooth running of the project and to define the resources needed for the various phases of the planning. Typically, the workplan should include:

- A basic time frame and timeline that should reflect some fundamental elements of the planning process
- A detailed description of activities proposed, based on the analysis of a wide range of practical, political and financial considerations
- A simple GANTT chart (named after Henry Gantt) is commonly used in project management, showing activities displayed against time (Gantt.com, 2012-2015). It depicts graphically the order in which various stages of the planning process should be completed to facilitate communication with partners and stakeholders. This should set out the duration of each phase, outputs and the key milestones. The GANTT chart should comprise:
  - Planning process stages
  - Major outputs
  - Key event dates
  - Critical milestones centred on key events
  - Key financial requirements
  - The schedule of implementation
  - Risks analysis for the plan and provisions to overcome unforeseeable difficulties or delays.

6.3.3 Scoping report

The scoping report may not be part of the initiation/establishment step but of the analysis step, depending on the specificities of the work system followed. In any case, it is compiled after the inception report and is guided by the work programme. It may include the following:

- The geographical boundaries and the description of the plan area.
- A preliminary assessment of the problems, issues, drivers, pressures, existing response and their effectiveness, risks along with their relative importance, policy context and interrelationships.

- Coastal governance baseline defining institutional, legal and policy context, as well as detailed identification and mapping analysis of the key stakeholders to identify their real competencies/ roles, their capacity and importance/relevance for the plan. The ICZM Protocol specifies the range of stakeholders to be included in the planning process: "the territorial communities and public entities concerned; economic operators; non-governmental organizations; social actors; the public concerned". For a truly integrated plan (see section I) a few more may be needed to cover and represent IWRM, aquifer and groundwater concerns properly.
- A communication strategy.
- A potential preliminary vision for the plan area (again, its elaboration may be carried out in parallel or in sequence depending on the case).
- SEA decision. The environmental authorities of the relevant state should therefore be consulted on the requirement for an SEA and its TOR. In a number of cases an SEA might not be needed but only an EIA on major infrastructures is to be included; but these are not part of the plan itself.

6.3.3.1 Defining the territorial scope

Geomorphological/physical considerations

Section I includes a clear reference to this issue, including the provisions of article 3 of the ICZM Protocol for the Mediterranean, which defines the geographical boundary of the coastal zone as the:

(a) "seaward limit of the coastal zone; the external limit of the territorial sea"

(b) "landward limit of the coastal zone; the limit of the competent coastal units"

Exceptions to this are defined where:

1. "the seaward limit is less than the external limit of the territorial sea"
2. "the landward limit is different, either more or less, from the limits of the territory of coastal units as defined above, in order to apply, *inter alia*, the ecosystem approach and economic and social criteria and to consider the specific needs of islands related to geomorphological characteristics and to take into account the negative effects of climate change." (UNEP/MAP/PAP, 2008.)

In this respect, more recently (September 2013) the UNEP/MAP Secretariat specified the lists of series of Annexes to the SPA/BD Protocol and the reference list of habitats adopted by the Parties to the Barcelona Convention that should be amended to become further meaningful for the coastal terrestrial habitats/species. This would ensure that the two protocols apply the EcAp in an integrated way. During the development of the plan, it will emerge if the same or a different body will be responsible for the implementation of the plan.

The maximum seaward limit is therefore relatively clear: that is, the external limit of the territorial sea. However, this is to be decided according to the size of the area chosen for the plan. The landward limit is, however, less clear – the type and nature of "competent" coastal units varies enormously around the Mediterranean in terms both of their geographical scale (from small municipalities to extensive counties and regions), and in terms of their functions, competencies and capacities.

It is emphasized again that defining the territorial boundaries of the planning area is of crucial importance for the smooth elaboration and implementation of the plan. The boundary should be defined in a way that encompasses all important problems in the coastal zone most effectively, including – if needed – transboundary issues. That means that the boundary should include ecosystem, socioeconomic system and associated water resources important for the zone. In addition, one should keep in mind that climate change may affect the territorial boundaries and, therefore, the boundaries should reflect future scenarios. Climatic changes may impact areas that do not respect the boundaries of a coastal zone as defined in the plan. Sea-level rise, for example, may well affect areas outside the defined zone, and extreme events could impact areas that extend beyond the defined

boundaries yet are part of a larger area that includes the coastal zones.

The water resources management plan, on the other hand, must cover an entire river basin district and, at least in theory, there should be one administrative authority for the entire river basin; this is often served by a river basin organization. Some countries follow that approach (suggested also by the WFD) while in other countries historically pre-existing administrative structures (e.g. perfectures or other decentralized entities of the national administration) were maintained and mandated for the management of "operational parts" of a river basin. Where river basin districts are particularly large, the division of the district into operational areas/sub-basin areas is both possible and recommendable. This provides an opportunity for ICM plans which will cover entire river sub-basins in coastal areas. These sub-basins usually cover transitional waters, estuaries, wetlands, coastal aquifers and coastal waters, and smaller or larger areas of the upstream river parts, according to local conditions and needs. Within such sub-basins in the Mediterranean we frequently identify intermittently flowing and stagnant sections of rivers where fresh water is mixing with sea water and a series of complex biogeochemical processes take place under anoxic and intermittently anoxic conditions (Scoullos *et al*., 2014). With respect to groundwater it is necessary to encompass the area that has significant impact on the coastal ecosystem and socioeconomic activities. These water bodies should be fully integrated within the ICM plan in order to fulfil the requirements of both IWRM and the ICZM Protocol (in particular article(s) 18 and 10).

In practice a pragmatic approach is proposed. The experience from the preparation of the Buna/Bojana plan (see Experience from Buna/Bojana, chapter 3.5) is an interesting practical illustration of the challenge of defining boundaries, notably in a coastal zone transcending the boundary of Albania and Montenegro. In this case, the boundary was defined by adapting the guidelines in the ICZM Protocol and the EU WFD and the natural characteristics of the area, and refined according to local circumstances.

From the above it becomes clear that the exact geographical scale of the plan area cannot be precisely predefined. It will be determined by taking into account a combination of the following:

1. National guidance or the allocation of plan responsibilities to individual administrations or to levels of administration such as coastal regions, river basin authorities, counties/prefectures or municipalities
2. The importance of freshwater resource characteristics and eventual historic water rights and/or allocations to certain communities or sectors, coastal or upstream, including traditional administrative borders
3. The physical nature of the area and its landscape (scientifically the most appropriate)
4. Initiatives from local coastal administrations
5. Local and traditional perceptions of the plan area and its priority issues
6. Functional areas (e.g. in the neighbourhood) that share common infrastructure, transport and access
7. The characteristics of the marine area, which should always be included/considered.

Whatever the scale, the plan itself should recognize the inter-dependencies and provide for synergies, on the one hand within the plan area and its ecosystems and on the other between the plan zone and the neighbouring areas, as explained in section I and further detailed below.

Balancing Physical, Administrative and Operational aspects of boundaries

For deciding the plan boundary the competent coastal units/entities should be reconciled with the ecosystem, economic, social and political criteria and "geometries" as above, but also take into consideration the actual management potential (the highest possibilities for efficient management). This also applies to maritime zones, where economic, social and sometimes wider political

criteria usually prevail, including recreation, coastal tourism, landscape aesthetics, coastal/marine archaeology, culture, agriculture and many other economic uses, and also patterns of transport, accessibility and urbanization. In order to define boundaries of the plan, main processes and impacts should be recognized and the boundary should be delineated in such a way that the transboundary connections (with other similar national entities or other countries) are easily understood and managed. In this manner the connections between different systems (natural, man-made, social, economic, etc.) can be recognized and addressed more easily. In the same manner drivers and associated pressures and conditions for the land-freshwater-sea interface should be considered in order to define a boundary which is appropriate (i.e. as clear as possible). On the other hand, in most situations ecosystems are linked as open systems, and extend even beyond the boundaries of the entire catchment area.

Within a fully integrated approach involving water resources, groundwater and aquifer management the boundary of concern may extend to include entire river basins and hydrological management units including both recharge and discharge areas; the latter in particular may extend far beyond the plan area. Similar concerns often apply to biodiversity planning, which cannot operate effectively in closed ecosystems.

On the other hand, experience has shown that the use of administrative boundaries should be retained where possible to maintain the integrity of stakeholder ownership accountability and recognition, policy conformity and statistical information. In conclusion, in complex situations a balanced pragmatic compromise between ecosystem and administration concerns may be required. It is not only the ecosystem that may extend beyond a "manageable" physical or administrative boundary but also certain operational aspects: policies, strategies, tools (e.g. communication) or impacts.

ICZM has traditionally dealt with the challenge of tackling issues that transcend management boundaries by accepting that, although the physical boundary remains fixed, policy and programme actions may be required "upstream" or "downstream". In such a case, the principle and practices of differentiated intensity management and/or zonation (explained in section I) may be applied. It will be the responsibility of competent authorities or individual parties to define the appropriate zone boundaries at the scoping stage. This in turn may feed back into the stakeholder analysis as there may be significant interested bodies or individuals who may be required to provide input.

In reconciling the differing sectoral boundaries and scales based on different concepts, the IMF adopts the following approach: it recognizes that policy- and programme-level actions are designed to impact within a boundary fixed or close to administrative entities, but that those actions may also take place externally to those boundaries.

The central message is that, while a map boundary may be fixed and defined clearly, the operational limits will almost inevitably spill over significantly into adjoining areas, and possibly into areas which, although relatively physically remote from the plan area, are functionally linked within the boundaries of ecosystems in terms of drivers, pressures, impacts and the necessary responses. In such an approach the concept of differentiated intensity management could be applied.

Overall, a pragmatic approach is necessary. While the plan is being prepared, more details should be provided on how to deal with conflicts between administrative definitions and ecological, economic, social and political differentiations within the zone or with neighbouring areas. Some reconciliation and resolution mechanisms of eventual conflicts and arbitration processes should be proposed and agreed upon. The local plans should, then, work within the agreed boundary definitions.

It is noteworthy that the boundary of the plan may extend beyond national boundaries, where relevant. Article 28 of the ICZM Protocol draws special attention to the need for transboundary cooperation: "The Parties shall endeavour, directly

or with the assistance of the Organization or the competent international organizations, bilaterally or multilaterally, to coordinate, where appropriate, their national coastal strategies, plans and programmes related to contiguous coastal zones. Relevant domestic administrative bodies shall be associated with such coordination." Similar statement and practices are also valid for the IWRM plans (see also in EU WFD).

6.3.4 Scoping the problems, issues, drivers, pressures and risks

6.3.4.1 The objectives

The objective of this task is to describe the generally understood conditions of the plan area at the start of the planning process, whether or not they are verified or verifiable at this stage. It is better to include all perceived problems and issues at this stage, leaving them to be distilled into a manageable and refined set of core issues later in the process.

The first analysis of key problems, issues and actors should be relatively cursory, primarily to guide future discussions, assist in the preliminary mapping of stakeholders and identify work priorities. It should be recognized that the above may change to some extent and need to be refined over the whole project cycle once a wider range of stakeholders is brought into the process.

The initial identification of drivers and pressures could be carried out to describe how natural and societal drivers lead to pressures on ecosystems in the plan area. In addition, it can provide a vital communication tool to engage stakeholders.

The objective of the risk identification is to analyse key areas of uncertainty, to understand and explain vulnerability, and to help identify measures to increase the resilience of the plan area. This task seeks to identify natural and man-made risks to the plan area that are of a magnitude that exceeds normal trends and/or other pressures.

6.3.4.2 Methodologies and tools

National, subnational and local literature search, review of current and former projects and programmes; stakeholder consultations and interviews; use of local consultants; observation; brainstorming; strengths, weaknesses, opportunities, threats (SWOT) analysis (Box 6.1); initial drivers identification, etc., are all included in the methodologies and tools to be used for the scoping. As mentioned above, the selection of issues must encompass the full spectrum of the three pillars/facets of sustainability (i.e. environment, society and economy); an observer bias in the identification and selection of issues (e.g. resulting from the professional background of the persons conducting the analysis) should be avoided. The nature and quality of existing governance is also a key theme that needs to be included in the analysis of problems and issues. The problems and issues could therefore be classified and described under governance, environmental and socioeconomic headings.

The identification of initial drivers and pressures at the establishment stage will primarily be a desktop exercise supported by participative techniques such as brainstorming; for example the Blue Plan's IMAGINE (www.planbleu.org) systemic and sustainability analysis method or the SUDECIR method (Kontostanou-Karalivanou *et al.*, 2000). Drivers are the high-level forces that "impel" the society to impose or decrease pressure on the environment of the plan area. As with the problems and issues analysis, the identification of drivers must comprise the full spectrum of the three pillars/facets of sustainability but also identify, very broadly, obvious gaps and overlaps in governance as part of the socioeconomic and cultural reality of the plan area.

Box 6.1. SWOT analysis example for coastal zone

"Lake Bizerte Charter" (www.h2020.net/news-and-events/news/95-the-lake-bizerte-charter-a-step-towards-its-sustainable-development-horizon-2020-enhances-stakeholder-participation-for-the-integrated-management-of-lake-bizerte-in-tunisia.html).

SWOT analysis:

- Group exercises with different types of stakeholder groupings at both centre and local levels;
- What is percieved as a "strength" by one could be perceived as a "weakness " by others!

Although recognizing problems and shortcomings, to focus on possibilities, embracing the potentials of the future!

SWOT analysis:
S: Strengths;
W: Weaknesses;
O: Opportunities;
T: Threats.

Technical resources

Natural resources;
Social resources;
Human resources;
Administrative resources;
Competence, capacity resources;
Financial resources;
Climatic resources.

www.tvrl.lth.se/fileadmin/tvrl/files/vvr040/10_ICZM_3pp.pdf

Additionally, the analysis of drivers should also include relevant existing or potential economic, social and environmental policies and programmes of national or local governments that are likely to drive change in the plan area or, even, its neighbourhood. Examples include subregional economic policies such as incentives for development of particular sectors; agricultural subsidy regimes; fisheries quotas; and waste- and water-related provisions and directives. These may include both national and local policies and legal and fiscal instruments, as well as relevant site-adapted global and regional conventions and European legislation. Conversely, the lack of a comprehensive or adequate policy and legislative framework may also be considered a driver.

The scoping should include climate drivers and pressures, which are usually dealt with in the adaptation to climate change (national) plans; these should serve as a source of data. At this stage an identification of these pressures, and an idea of where and when they are likely to be most serious, is required.

Typical coastal zone drivers and pressures (indicative rather than definitive at this stage):

Local (land-use change, urbanization, tourism and recreation demand, wastewater discharges, solid waste, agriculture intensification, traffic, water abstraction, etc.)

Regional (water abstraction, change of regional hydrological regime, fisheries and aquaculture, watershed deforestation, air pollution, upstream change in land use and crops, etc.)

Global (economic and population growth, international transport and trade, climate change, sea-level rise, etc.)

Risk identification and initial risk analysis is primarily also a desk exercise in conjunction with key stakeholders and technical experts from relevant sectors. Examples include severe flooding; acute pollution from activities in the watershed or the adjacent marine area; or enhanced disaster risk as a result of topography (e.g. high soil or coastal erosion, slidings); sensitivity or proximity to a major natural or man-made risk source (e.g. forest fires, industrial accidents); or even social or economic instability. Risk vulnerability is conventionally categorized for each risk according to the:

1. nature of the risk and its consequence
2. magnitude of the possible adverse consequences from each risk
3. probability of occurrence of each risk.

The most demanding exercise is to consider the individual risks in combination and synergy.

Quantification may be possible for several types of risks (e.g. area of land subject to flooding according to likely scenarios). However, in many cases, approximations and simplifications similar to those proposed above may also be appropriate for risks.

Climate change adds a new and challenging dimension to risk analysis in coastal areas, not only because of the uncertainty of its scale and impacts, but mainly because of its long-term nature. Guidelines for integration of climate variability and change aspects into the ICZM Process were elaborated by PAP/RAC within the GEF project "Integration of climatic variability and change into national strategies to implement the ICZM Protocol in the Mediterranean". Guidelines are built along the same stages of the planning process and are therefore a good reference to take into account. (http://pap-thecoastcentre.org/pdfs/National ICZM Strategy Guidelines.pdf).

6.4 Governance for planning

6.4.1 Establishing coordination mechanisms/bodies

The objective of this task is to ensure that the plan drafting process is based on good governance principles, is well informed, representative and transparent, and enhances the plan's legitimacy and long-term sustainability. To this end, appropriate bodies should be put in place. The development of this stage is a natural result of the initiation stage.

There are three important, and very distinct, qualities/functions that should be included within any plan drafting coordination mechanism: to ensure political and social legitimacy; to provide scientifically based, high-quality solutions; and to address aspirations and include the opinions and expertise of the community.

Sometimes these three functions can be placed on a Vital, Essential and Desirable (VED) scale:

1. Vital: political legitimacy and accountability, financial management
2. Essential: technical/operational guidance and support
3. Desirable: local representation and consultation.

There are various governance architectures, and each situation may require a locally tailored approach; however, the following model reflects the above VED scale. The stakeholders, as well as the administrations responsible for ICZM and IWRM, are usually common with a few, sometimes significant, differentiations (see 3.4). The EcAp also requires coordination and participation by (more or less) the same administrative bodies and stakeholders.

Finally, institutional coordination with bodies responsible for climate adaptation and mitigation strategies and plans is required. This may be done through the entity responsible for the UNFCCC national communication or any equivalent body or interministerial committee or related provision.

In addition, local authorities are often responsible for local planning processes towards climate change

adaptation and mitigation measures. It is essential that these authorities and their plans and procedures be brought into the planning process at this (establishment) stage.

1. Steering group or committee

Composition: representatives of the core political and financial stakeholders in the area covered by the plan, including representatives of the national government, through the competent line ministries (environment, water, mercantile marine, agriculture, fisheries, forestry, planning, energy, etc.), the higher-level competent local administration(s) and of the funding bodies. Good and appropriate balance of local, regional and national representatives is of vital importance. Depending on the case, some of the above may participate only through experts in the technical or consultative group. It may be useful that very few external experts are included in the steering committee, if resources allow for the transfer of knowledge and help in consensus building. This group needs to include at least one representative from national government or the higher-level competent local administration(s) familiar with climate change issues, and ideally involved in one or more other national/regional bodies dealing with this topic.

Function: to ensure the smooth running of the project; to support and facilitate implementation of decisions; to enhance synergy among competent authorities to ensure political legitimacy and provide financial accountability.

2. Technical group

Composition: technical staff or representatives of organizations and institutions with knowledge, information and data resources for the plan area and its key issues (e.g. coastal, marine, surface and groundwater, land use), along with logistical and Information and Communications Technologies (ICT) support staff. The technical group also needs one or more persons with a working knowledge of adaptation to climate change. Experts from ministries, agencies, universities and/or consultancies are expected to be its members.

Function: to develop a high-quality plan using the best available technical and logistical support.

3. Consultative group

Composition: representatives of the two above-mentioned bodies. The final composition of the group is defined after stakeholder mapping/analysis. This group should include someone responsible for communication as well as representatives from sectors where climate issues have been assessed.

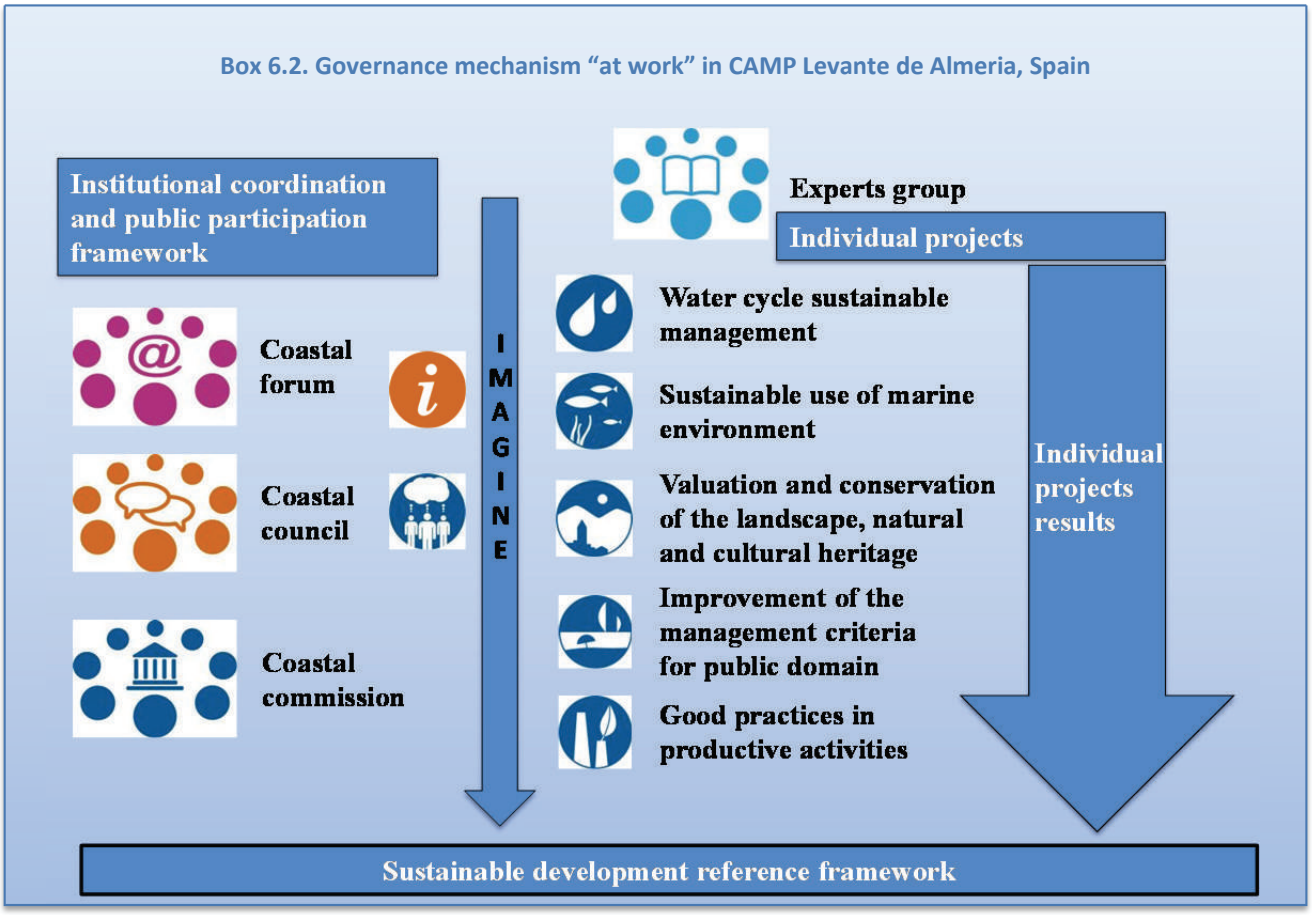
Function: to reflect the opinions and expertise of the community and to act as a consultative body at all stages of the drafting and approval of the plan.

The steering group or committee requires timetabled and formally constituted meetings. Depending on the case, the technical and consultative groups may be more flexible and some of their meetings may be ad hoc or eventually served through mailing lists, virtual media, etc. Each group will require its own clear and precise Terms of Reference (TORs) to specify remit; membership distribution or roles; work division; frequency of meetings; meeting procedures, etc. The CAMP Levante de Almería, Spain, was a very good example of how the coordination mechanism worked in practice. The project had its technical and governance parts, which worked hand in hand according to their mandates and capacities. The so-called “institutional coordination and public participation framework” – that is, the governance mechanism of this project – had all three levels elaborated above. This mechanism enabled the close coordination between the technical part of the project and its governance structure which was established at the very beginning of the project. See Box 6.2 and find more at www.camplevantedealmeria.com.

When the integrated plan is finalized, the steering group approves the plan and specifies the route and appropriate national or regional procedures and body or bodies to formally adopt/endorse the plan. The plan may be adopted by one or more ministries; and by national, regional or local authorities. It may also receive joint endorsement.

Sponsoring organizations funding its implementation or investing in development in the plan area may, according to the plan, also ask for or require a formal endorsement as a prerequisite for investment or, vice versa, may be asked to endorse the plan or at least the vision (see Bizerte Charter, www.h2020.net/resources/training-materials/finish/192/1712.html).

Box 6.2. Governance mechanism "at work" in CAMP Levante de Almeria, Spain



6.4.2 Themes to be considered

It is important to design the scale and complexity of the governance structure consistent with the staff and logistical resources available to support it. It is necessary to take into consideration the characteristics of the plan area and the problems being addressed, especially with regard to the transboundary drivers and impacts.

Central themes for coordination and governance are to:

- ensure equal involvement/participation of all stakeholders and partners
- search and secure funding for the preparation/communication/approval of the plan and, if possible, for its implementation
- set realistic goals and objectives with a reasonable implementation time frame
- keep ongoing, open lines of communication with all stakeholders involved, even those who are eventually most sceptical
- have unconditional support of local and regional/national authorities and selected officials following the process
- have a well-trained and committed staff
- standardize and network all software, hardware and protocols as much as possible
- use ICTs as wisely as possible.

6.5 Understanding the governance context of the plan area

6.5.1 The objective

The objective of this task is to define and understand the actual governance structure and power distribution mechanisms in the plan area. Stakeholders should be informed and facilitated, not only to participate and get involved in the development of the plan, but so they are prepared for its implementation on the ground after its completion. Also, they should provide feedback into complementary plans and programmes, and identify policy and institutional gaps. For appropriate understanding of the governance issue see 1.3. This step is a prerequisite for the full engagement of stakeholders as described in the next step.

The "mapping" of the many relevant institutions, along with their policies and functions, is an essential first step in defining the operating governance context. A thorough understanding of key institutional, legal and policy drivers at international, national and local scales, and their interaction, is key to ensuring the relevance and effectiveness of the plan. The spatial boundaries of administrations and their relevant functions should also be mapped, correlated to the decision-making processes and if necessary revisited/adapted.

A stakeholder analysis should be performed to identify and assess the importance of key organizations, groups of people, institutions and even individuals who may have significant influence for the development and success of the planning process and, later on, for the implementation of the plan. This analysis is in essence an act of identifying those in the plan area and sometimes outside of it (e.g. national, regional, professional, environmental organizations) who are likely to affect and/or be affected by the actions proposed in the plan. It is important for the analysis to include, to the extent possible, the real competencies/roles and capacities of the various stakeholders and also the relationships (e.g. cross-cutting responsibilities, missing and overlapping responsibilities, rights, synergies, antagonisms, levels of conflict) within and among them.

Relevant institutions to be considered at national scale are the relevant government ministries or agencies. As explained in section I, institutions responsible for coastal and for water resources management may or may not be the same. In addition, the influence on current or future development of a plan area of other sectoral ministries or agencies – for example water, agriculture, forestry, fisheries, tourism, infrastructure, industrial or urban development, maritime affairs, etc.– may be of equal or greater significance.

With respect to climate change, the institutional context at national level is usually well established and includes ministries of agriculture (for possible impacts in terms of crop yields); environment, especially the department dealing with water management, pollution control and ecosystem health, and eventually the departments responsible for land classification and land-use planning; water resources management, if exists; health, dealing with consequences of heat waves, vector- and waterborne diseases and increased risks of food contamination with higher temperatures; tourism, etc.

A mapping and understanding of relevant private and particularly competent programmes, as well as international, regional, national, local NGOs and CSOs is also essential. In many countries such organizations have the expertise, convening power, constituencies and legitimization as well as resources and influence comparable, or even greater, than some local or even national authorities. Academia, and researchers and their institutions, are another important group of stakeholders to be involved.

Productive sectors, enterprises and individuals with significant investments in the plan area and the related labour unions and employers associations, etc., are important stakeholders which may be directly or indirectly affected by the new/revised plan. They and others will be well aware of the increased climate risks and will be planning to take

some measures as far as climate variability and change are concerned. For instance, one sector most endangered by climate change in a plan area may be the insurance industry; it and the banking sector may be key partners in identifying appropriate alliances and adaptation measures in the plans. It is critical that the ICZM and IWRM take into account the private sector's plans and provide it with the right framework and incentives so it can make a cost-effective contribution to the plan and its implementation.

As well as the private sector, the potential role of NGOs as service providers should be well understood and explored. They may be able to provide information, commentary on data, etc., or means (e.g. meeting space); they may be potential clients for plan outputs, potential facilitators or intermediaries with other key groups, or partners in the implementation of certain tasks in the management itself.

Similarly, the policy context may be equally broad, depending on the site. It may range from spatial plans to economic development strategies and sectoral plans and policies for environmental protection, energy, transport, waste, agriculture, tourism, water resources management, etc. The key plans and programmes, along with the organizations responsible for them, must be identified.

In the analysis of power distribution, it is as important to assess the effectiveness, influence and efficiency of the institutions, policies and programmes as it is to identify their existence and significance or their absence. Mapping should therefore encompass all strengths, weaknesses/gaps and eventual tendencies and opportunities.

Finally, the legal context for ICZM, IWRM and aquifers/groundwater planning interventions should be defined. In principle, major legal acts affecting overall coastal or river basin development are being adopted at the national or regional level. All relevant laws and regulations should be identified and their impacts on the respective plan area briefly assessed. In addition, it is most likely that regulations at lower, subregional or municipal administrative level also exist. They should be identified and analysed in the same manner described above.

6.5.2 Methodologies and tools

Stakeholder analysis is carried out in the establishment stage, in most cases, but its results will be fully utilized in the subsequent stages of the planning process. The process should allow for the iterative evolution of the analysis as more stakeholders become involved.

Identification of legislation, policies and programmes is a desk-based analysis of documents supplemented by interviews with individuals or focus groups early in the process.

Various tools are available for institutional and functional analysis for mapping and clustering. However, there is no straightforward technique for identifying "political" sensitivity by those managing the process. Institutions should be considered according to their:

- remit, both functionally and spatially
- relevance to plan area, water resources and climate change, as well as to their ability to deal with problems at policy and operational level
- resources and skills, including technical resources, personnel, databases and information available
- influence, including in formulating and proposing legislation and in political/social communication (informing public opinion)
- role in relation to the planning process as either service provider, client, facilitator or potential management partner.

6.6 Engaging stakeholders and preparing a communication strategy

6.6.1 The objective

The objective of this step is to ensure full engagement of stakeholders and the public in the planning process and its implementation.

Time and resources must be made available for the process of consultation, either formally and/or informally, to ensure that stakeholders and the wider public are not just aware of the drafting of the plan and its importance, but are also engaged in the process. As far as climate change is concerned key groups need to be informed about the potential major climate changes in the area of interest, the likely consequences of these changes and the increased risks they may represent. This can be done even without providing much technical detail.

The groups that need to be involved have been mentioned already in this document. They should include local communities; government agencies; NGOs; media and opinion leaders, etc.; business, such as industry providers of tourism and transport services; the energy sector (particularly dams upstream and renewable resources installations); private developers; and those engaged in agriculture, forestry and fisheries.

The above stakeholders are expected to participate in consultations and to identify recommendations and preferred options to be included in the plan. The same groups need to be consulted once these options have been screened/evaluated technically to get their feedback. The final plan will be based on a consensus that includes their active involvement in formulating the common vision (see 6.6.3 and chapter 8).

6.6.2 Developing a communication strategy

It is recommended that a simple communication strategy be produced during or shortly after the establishment stage, outlining how these different participatory activities will be carried out and what other, wider communication activities will be undertaken.

The communication strategy should be developed with the input of one or more experts. It is essential that the requested expertise should include not only communication studies and skills per se (knowledge of techniques, etc.), but also expertise on participatory processes and knowledge of the issues and the area in question.

A communication strategy could contain the following:

1. Communication objective – communication should support the vision and the objectives of the plan as well as the key messages (the "identity" of the plan) including the main issues to be tackled and the expected outcomes. ICZM, IWRM and other acronyms are not recognized or relevant to the non-technical audience. Unnecessary reference to the technical nature of the process can be a barrier to effective communication. The key message should be positive, simple, straightforward and widely accepted (see Setting the Vision, chapter 8). The language used should be simple and avoid jargon.
2. Identification of key audiences: this should follow from the stakeholder analysis, but should include a brief description of what each group should know about the plan; what reaction or result from each group (e.g. raised awareness, becoming involved, change in entrenched attitudes, giving political support) is expected and where they could contribute more. The identification and involvement of the appropriate media involved is a very serious issue. Key individuals who may become "ambassadors" for the plan may also be identified. The audiences will also divide between external (i.e. local communities, government agencies, NGOs, business, media and opinion formers, etc.), and internal (partners, technical staff and external consultants, etc.). The communication strategy has to deal with these two groups separately.

3. Communication and promotion mix: this should define how the message is conveyed. For instance, to the external audience this will include press and TV messages, online and printed material, events, press conferences and other meetings. Internally this will include coordination meetings and use of printed and electronic media (including e-mailing and social networking). Training in communication may be required for some partners. Innovative methods of communication and visualization should be used widely and wisely.
4. Measurable targets and indicators: these should be set, whenever possible (e.g. number and frequency of press releases, printed material, number and type of meetings), along with indicators (or at least indicators of immediate response to the strategy) of effectiveness (e.g. hits on website, attendance at meetings).
5. Budget: define what funds are required for communication within the programme and what external support can be offered by partners (e.g. human resources, web hosting, meeting venues).
6. A professional branding and identity specification: this should be developed to ensure consistency of presentation across media and the Internet throughout the process, and enhance the wider visibility of the plan.

6.6.3 Formulating the plan vision

The scoping process should help to identify the key points around which the vision could be formulated, as well as themes where there are already different, potentially conflicting sectoral visions.

The first step in the planning process is to formulate the vision and goals of the integrated plan. The planning process should be guided by a vision statement to be discussed and agreed by the stakeholders. A successful vision statement should be site-specific and cover, in a balanced way, the shift to a better environment and overall SD based on a green/circular economy with the specific concerns and aspirations of the stakeholders identifying:

1. what should be done to remove what is unsustainable
2. how to move gradually to fulfil the prerequisites and aspirations that are compatible with sustainability.

Technically this will require a combination of inputs from meetings and written procedure. To ensure that the latter is a meaningful exercise the drafting group should frequently test whether the vision reflects the aspirations and views expressed by the stakeholders.

The underlining principle of the vision is that the SD of a plan area should improve the life of its citizens based on greening the economy and enhancing social cohesion while protecting or even restoring/ improving the environment. In a green economy, for instance, the growth in income and employment should be driven by public and private investments that drastically reduce carbon emissions and pollution, enhance energy and resources efficiency, prevent the losses of biodiversity and ecosystem services and create an equitable society. Economic, social and environmental issues in the plan area are inseparable and have a major impact on the local (green) economy. How to shift towards a green economy in a particular plan area is unavoidably linked to wider national or even international (e.g. EU) provisions. Existing or expected frameworks, laws, incentives, etc., should be taken into account in drafting the vision (a forecasting exercise) (see 7.3.1). On the other hand, the stakeholders require a mix of short-, medium- and long-term policies well adapted to the characteristics of the plan area (natural, social and economic) and its wider environment (cut-off upstream parts of the river basin and other areas of interest), but most significantly the plan should resonate with the aspirations of all stakeholders through open debate and consensus.

For example, spatial plans may propose large urban and tourism developments in areas that are highly vulnerable to climate change (e.g. due to sea-level rise and coastal inundation). In other scenarios, proposals to enable protection from flooding or coastal erosion could vary significantly on their

impacts on biodiversity losses, natural recharge of aquifers, etc. The need for SD is a well-accepted determinant of the vision for the future; however, there are often substantial differences in understanding what actually is sustainable and how sustainability can be obtained.

The scoping report should at least pose the question "what do you consider unsustainable that needs to be changed?". This is a very important unifying question, leading gradually (according to the experience of the authors) to consensus. This may be followed eventually by a second question: "what do we want to see in the area in a 15-20 years' time?". Based on the responses to the above a tentative vision could be proposed (at least among the majority of key stakeholders) that could then be further exposed to a wider audience in order to reach consensus and trigger the next stage – analysis and futures.

PAP/RAC has defined a generic model vision for the Mediterranean coast which encompasses six principles of SD (Shipman *et al*., 2009):

"A coast that is:

- ***resilient*** *– resilient to climate change, resilient to natural processes, resilient to human processes*
- ***productive*** *– productive financially, competitive, high in value, increasing GDP, alleviating poverty*
- ***diverse*** *– diverse in ecological, diverse in experiential terms*
- ***distinctive*** *– distinctive culturally, distinctive in marketing*
- ***attractive*** *– attractive to visitors, investors and to local people*
- ***healthy*** *– free from pollution"*

These principles are useful attributes for such a vision.

Based on the vision statement, goal and objective setting as a substantive exercise should be defined when a clear idea of the problem and full knowledge of the commitment to a solution are known.

In a number of very successful cases (Rhodes SUDECIR, CAMPs, Lake Bizerte 2013, Malta Non-conventional Water Resources (NCWR)/GWP 2014, Drin River Memorandum of Understanding (MoU), H2020 Capacity-Building/Mediterranean Environment Programme (CB/MEP), the coastal plan for the Šibenik-Knin county (Croatia), the Reghaia coastal plan and the national ICZM strategy, Algeria) the vision statement was prepared during open public meetings. At these meetings various phases or elements of the project were presented and discussed, such as the resumé of the Inception report, scoping report and feasibility study. Also, prior to the definition of those visions, discussions with target groups were convened. This helped the understanding of what "the novelist" wanted to say. In the cases above, the vision statement was negotiated and drafted openly in public. This is, undoubtedly, the best and most legitimate way to obtain a vision statement but such an exercise requires an extremely knowledgeable and experienced facilitator/arbitrator having a wide and common acceptance (e.g. a committed public figure with status).

6.7 Deciding on SEA

SEA is another assessment technique that may be relevant or necessary for the plan team to consult, because it is particularly required according to the provisions of EU legislation, and by law for some countries. For EU Member States SEA is required for large plans or programmes. SEA is also requested by ICZM Protocol's article 19 for plans and programmes affecting the coastal zone. However, with respect to coastal plans, programmes and strategies most of the requirements within SEA are already embedded in the ICZM Process itself.

*"**Strategic Environmental Assessment (SEA)** is a systematic process for evaluating the environmental consequences of proposed policy, plan or programme initiatives in order to ensure that they are fully included and appropriately addressed at the earliest stage of decision-making, on a par with economic and social considerations."*

Evaluating Socio Economic Development, SOURCEBOOK 2: Methods & Techniques. Strategic environmental impact assessment. EU Regional Policy, INFOREGIO, December 2009.

Obviously, if there is already an SEA prepared for the plan area, it should be taken into account, and vice versa. Experience has shown that an SEA should be carried out independently, but in close collaboration with the planning team, and may proceed in the same or a very similar manner as the planning process. It should also be an interactive process producing judgements and recommendations formulated by SEA experts, and should be viewed as an integral but parallel part of the planning process. The SEA report may be part of the plan, but in any case it must be clearly distinguishable.

Chapter 7:
Stage 2 – Analysis and Futures

7.1 Aim and objectives

The overall aim of the analysis and futures (alternative scenarios for the future) stage is to establish an operational foundation for the subsequent preparation of the plan and its implementation – making the invisible visible, and engaging stakeholders in the search for outcomes.

The objectives of the analysis and futures stage are:

1. to substantiate the issues and problems through more rigorous analysis and review, describe the present state and likely future trends
2. to evaluate the natural, technical, financial and managerial capacities of the plan area including future options resulting from climate change impacts
3. to assess system change and effective response to external changes and opportunities
4. to identify the strategic options of plan area development for achieving its goals
5. to identify carrying capacities and conditions for the allocation and use of the respective marine and land parts of the plan area in accordance with the identified expected changes
6. to generate and test alternative views of the future through the use of tools and scenarios
7. to lay the foundations of future cooperation and implementation through pilot actions and the identification of potential future funding sources.

7.2 Key tasks

1. Building the evidence: closer analysis of key issues where needed and undertaking the DPSIR policy cycle
2. Identifying futures: building alternative scenarios and, if conditions allow, testing (including pilot actions and identifying potential future funding sources).

7.3 Potential outputs

Diagnostic report: assessing of all our knowledge on the state and trends. It is recommended that the DPSIR framework is completed at this stage.

Alternative scenarios: it is always useful to consider more scenarios in order to have a better understanding of the future. These scenarios should also include a preliminary schedule of future funding sources for implementation, and a first set of pilot actions, where appropriate. The alternatives have to be technically feasible, environmentally sound, socioeconomically acceptable and politically permissible.

7.3.1 Building the evidence: diagnostic report

Building the evidence and the elaboration of the diagnostic report should start from identification of the sources of the existing data and information, and their collection and processing (e.g. coastal lands, marine waters, hydrological, environmental, socioeconomic, legal, institutional, infrastructure). Much information will be already available through the preparation of the inception and scoping reports. In some cases these reports may be framed as steps (preliminary or interim) towards the diagnostic report which may be given different names.

Its task is to facilitate better understanding of both the present context and the future alternative options for the development/evolution of the plan area. This may be achieved by including:

1. a general description of characteristics of the plan area, including capacity (natural environment, built environment, social environment, economic environment)
2. an analysis, in greater detail, of key problems, pressures, impacts and drivers, and then summarizing the existing conditions of the area

and its root causes, focusing on the agreed priorities (governance, environmental and socioeconomic)

3. an assessment of the water system structure and roles in terms of the hierarchy from governance to management and to organization, as well as what service functions the water system currently provides
4. a projection of the conditions going forward (forecasting) on the basis of possible or likely trends for periods compatible with the lifespan of the plan
5. an examination of factors such as goods and services provided by the ecosystem, along with issues affecting the wider area such as erosion, land husbandry, deforestation, water abstraction and pollution (both point sources and diffuse) either through their impact on the plan or by displaced impacts in other areas resulting from actions within the plan area
6. an analysis of the wider environment to provide necessary evidences of existing and future trends and impacts on the plan area and eventual footprint outside. Impacts from climate change are already taking place; the question about where assessments are needed for adaptation measures is governed by how fast these changes are taking place and their magnitude.

The objectives here are twofold: first, to ensure a solid basis for discussion and understanding of the current situation and of business-as-usual; and second, for comparison and understanding of the distance between the vision and the actual situation, to provide a basis for "backcasting" (Figure 7.1), testing, development and discussion of alternative futures. In other words, this will allow the vision to be realized and will "make the invisible visible".

Local or indigenous knowledge should also be recognized, valued and sourced. The affected citizens and those employed in the various economic sectors in a coastal/river basin community may have a profound knowledge of the coastal/river basin system, and should be actively involved in the analysis in order to improve the quality of the analysis itself.

The concept of backcasting (Quist and Vergragt, 2006) is central to a strategic approach to planning for sustainable development in a plan area. The successful outcome is imagined in the future and then the question is asked "what is needed today in order to reach that vision of success?". In fact, it is the same practice we apply as individuals when we plan a trip or when we search for a new home, etc. (see Figure 7.1).

Backcasting is often more effective than forecasting, which tends to produce a more limited range of options, hence limited creativity. Forecasting relies on what is known today and it is well known that our understanding of the current situation is always imperfect and that things change rapidly over time.

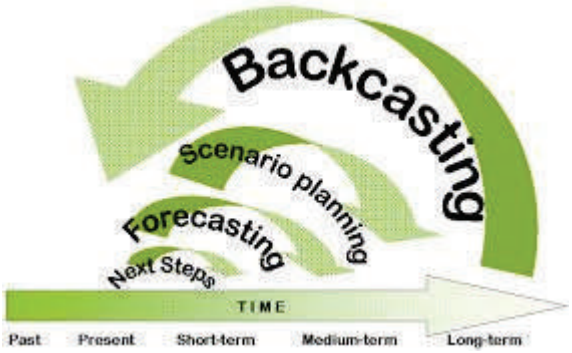


Figure 7.1. The concept of backcasting (www.wearearising.org/2009/01/13/backcasting)

Techniques and tools

While technical data, measurable objectives and indicators are easily visible and underpin integrative planning, it is the intangibles – the assumptions, interests, beliefs, agendas and real power structures – that must be also taken into account and engaged positively to allow any real progress. The challenge is how to create the preconditions for these intangibles to become apparent and play a legitimate role in the plan.

Much data and information will already be available, so the first task is to collect, assess and present this in the appropriate form. New research should only be required to fill the identified gaps or update old data and information. Importantly, the data and information collected should be fit for purpose for its intended use; that is, it should be appropriate and of a necessary quality, without being excessively complex or expensive to obtain.

Experience from the Buna/Bojana plan illustrates, however, an important practical issue when implementing the guidance – namely the lack of or unreliability of data in order to carry out the analysis properly. The scoping for the plan highlighted other practical concerns, not least the lack of, and need to collect data. An important example was the requirement for an ecological status characterization, a first for Montenegro and Albania, as a reference point. It was also necessary to harmonize data and mapping between the two countries including socioeconomic data and groundwater mapping. In practice these issues significantly delayed the progress of the plan in its early stages.

This practical example acts as a cautionary reminder that it will not always be possible to accurately quantify the analysis in all respects and that pragmatic choices may need to be made.

DPSIR framework

One of the important ways of utilizing the data at this stage is to construct a DPSIR framework, since it is a tool that aims to develop appropriate management responses to certain environmental problems. The main elements of a DPSIR framework are:

- drivers (or driving forces of certain environmental problem). These are frequently a result of human needs. They include, for instance, social, economic and demographic changes across the coastline or enhanced and demanding tourism; they may also link to changes in production and consumption levels, and people's lifestyles in general
- pressures on the environment resulting from drivers. Usually, these are reflected in increased emissions of harmful substances; land-use changes; excessive usage of certain resources; alterations in sediment supply or in water availability, etc.
- an altered state of the environment resulting from pressures. The state of the environment represents the level of environmental quality, which is reflected in the environment's biological, physical and chemical conditions
- environmental and economic impacts on ecosystems (loss of biodiversity, coastal erosion, social and economic impacts, repercussions on human health, etc.) result from alterations in the state of the environment
- responses are prioritizations which aim to reduce negative impacts on the environment and on the economy and society in general. Responses represent, broadly, the integrated plan and can address/affect any part of the chain between drivers and impacts. In the case of the planning process, the responses should be discussed in the form of proposals of how to deal with environmental issues.

Drivers and the resulting pressures on the plan area should be divided into two basic groups: (1) internal: those within the plan area; and (2) external: those outside the plan area and which may be transboundary. The internal drivers are controlled locally while the external drivers are subject to regional and/or global changes. Accordingly, it is at that level that they have to be

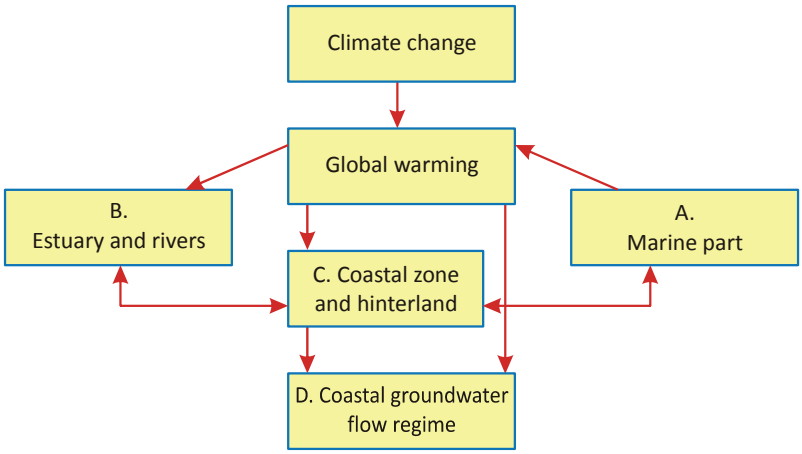
addressed/solved and at the same level the plan area adapts to the external pressures and situations (e.g. climate change, see Box 7.1). However, when speaking of water resources management, ICZM can and must deal with the current and expected pressures and situations (upstream and downstream processes and impacts) in an integrated way with IWRM, including aquifer and groundwater resources (Figure 7.2).

Box 7.1. Drivers and pressures relating to climate change

The main drivers and pressures for adaptation to climate change include the following: sea-level rise; changes in temperature, humidity, water acidity and precipitation (causing droughts and decline in water availability in some areas and during some seasons and causing floods in other areas and in other seasons); increased frequency of extreme events (hurricanes, floods, etc., heatwaves); and possible increases in risks of vector and waterborne diseases. The extent of impact of the pressures will depend, among other things, on future development and land-use plans.

For a local ICZM plan relevant data with information of some degree of spatial disaggregation should be assembled from existing sources (national meteorological service, scientific institutes, etc.). For further information on the likely pressures, a downscaling exercise may be needed.

The main impacts arising from climate change have been broadly identified under the following headings: damage to infrastructure from sea-level rise and flooding; health risks from heatwaves; risks to human life from extreme weather events; shortages of water due to changes in precipitation and possible saline water intrusion and contamination of groundwater; risks to human and ecosystem health due to water salinization; declines in agricultural yields; possible declines in tourism in the high season and possible increases in the shoulder seasons due to changes in climate; damage to ecosystems from changes in temperature, acidity, water availability and deteriorating quality, etc.



Coastal Areas	Impacts
A. Marine Part	Sea-level rise Acidification
B. Estuary and rivers	Increased risk of flooding Population at risk Changes in sediment load: riverbed elevation Backwater effect Saltwater intrusion Increased seepage Crop losses, land degradation, changes in ecosystems: decrease in diversity of species
C. Coastal zone and hinterland	Increased risk of flooding Increased wave attack Increased tidal range Increased storm surge Population at risk Changes in morphology: ▪ Coastal erosion ▪ Dune erosion ▪ Shoreline retreat Land losses, land degradation
D. Coastal groundwater flow regime	Saltwater intrusion in aquifers Rise in piezometric level Extra upconing saline groundwater Decrease in freshwater resources Increase of seepage: ▪ quantitative ▪ qualitative
Overall impact on water management and the coastal area, in general	Safety Domestic & industrial water supply Agriculture & horticulture: salt damage to crops Flushing of water courses (Beach) recreation: narrowing of sand-dune areas Ecosystems: degradation Navigation Irrigation Infrastructure

Figure 7.2. Impacts of climate change and the related sea-level rise affecting the water management and the coastal areas in general

Lesson: the DPSIR framework as a tool for integration

As explained in 5.2.1, the DPSIR framework provides a simple tool for capturing, visualizing and analysing the cause-effect relationships between the interacting components of complex social, economic and environmental systems, and in managing the information flow between these parts. By thinking about the whole system within the DPSIR framework rather than the individual themes or sectors, decision makers and stakeholders can better visualize how elements in the system are linked together, informing the plan accordingly.

Experience from the Buna/Bojana plan: Using the DPSIR framework

The DPSIR framework (Figure 7.3) has been given practical effect by the experience of the Buna/Bojana plan. While the legal and resource origins of IWRM, ICZM and coastal aquifer and groundwater management differed, the DPSIR framework provided a systemic tool for integrating and visualizing the interplay between the key drivers. These drivers included the attractiveness of the coastal zone in the Buna/Bojana plan area and the pressures on the environment such as unplanned urbanization, and the state – as well as the current quantification – of that issue (e.g. widely dispersed development, the number of illegal constructions). This, in turn, led to impacts on ecosystems, landscapes and water pollution, as well as the cost of infrastructure services. The response, or lack of response, might for example include measures to improve regulation, or financial instruments to deter such development. In turn these responses provide feedback on the drivers, on the pressures, or on the state and impacts (in reality, the relationships are not so linear and the drivers, pressures, state and impacts interrelate in complex and overlapping ways.)

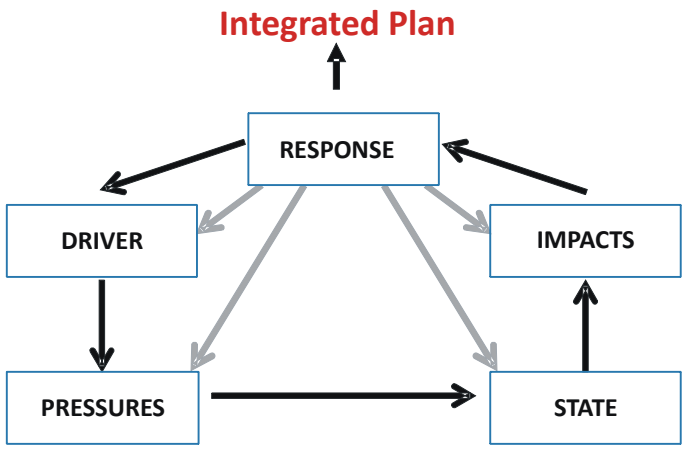


Figure 7.3. The integrated plan – the interrelationships of drivers, pressures, state and impacts

Thus the Buna/Bojana plan was able to clearly integrate and visualize, in a simple tabular form, the common issues and themes from the three disciplines (IWRM, ICZM and coastal aquifer and groundwater management) into a common framework for analysis. The DPSIR's key value was in breaking down boundaries between the IWRM, ICZM and coastal aquifer and groundwater management, facilitating an integrated approach.

As explained in chapter 5, the responses step leads to the integrated plan. The way this is done is not described in the DPSIR methodology and it has been approached differently in the various cases where DPSIR has been applied. The experience of the Buna/Bojana plan highlighted a set of practical difficulties in linking the analysis and description of the drivers, pressures, state and impacts to effective cross-sectoral responses and the plan objectives.

In a complex policy environment, the analysis of problems and issues does not automatically lead the policymaker to the responses in a linear fashion and a parallel dialogue is required to identify common societal objectives.

This was overcome in Buna/Bojana through an innovative adaptation of the "bow-tie methodology" (www.cgerisk.com/knowledge-base/risk-assessment/thebowtiemethod) developed to manage risk, typically in a complex industrial environment. Simply put, the method combines multiple causes and multi-sectoral responses into a single diagram centred on a set of agreed objectives.

The diagram, when plotted, resembles a bow-tie. Its value lies in its simplicity, and in demonstrating how the step is made from the complex analysis stage to the wide range of policy and programme responses and, in particular, in demonstrating the value of the multi-sectoral approach. Figure 7.4 illustrates the bow-tie developed for the Buna/Bojana plan.

A possible way to depict the state combined with pressures and eventual impacts, pointing towards appropriate responses, is provided by vulnerability assessment maps (Figure 7.5). As explained in 1.6, vulnerability assessment is a valuable tool for sustainable coastal zone management. It is a method used to determine more vulnerable (that is, unsuitable) spatial segments for the possible intervention or activity. Presented in a form of maps, these could be used as a useful communicating tool, illustrating the extent and relative severity of risk to which a system is subject (more at www.pap-thecoastcentre.org/pdfs/Synthesis_Report_web.pdf).

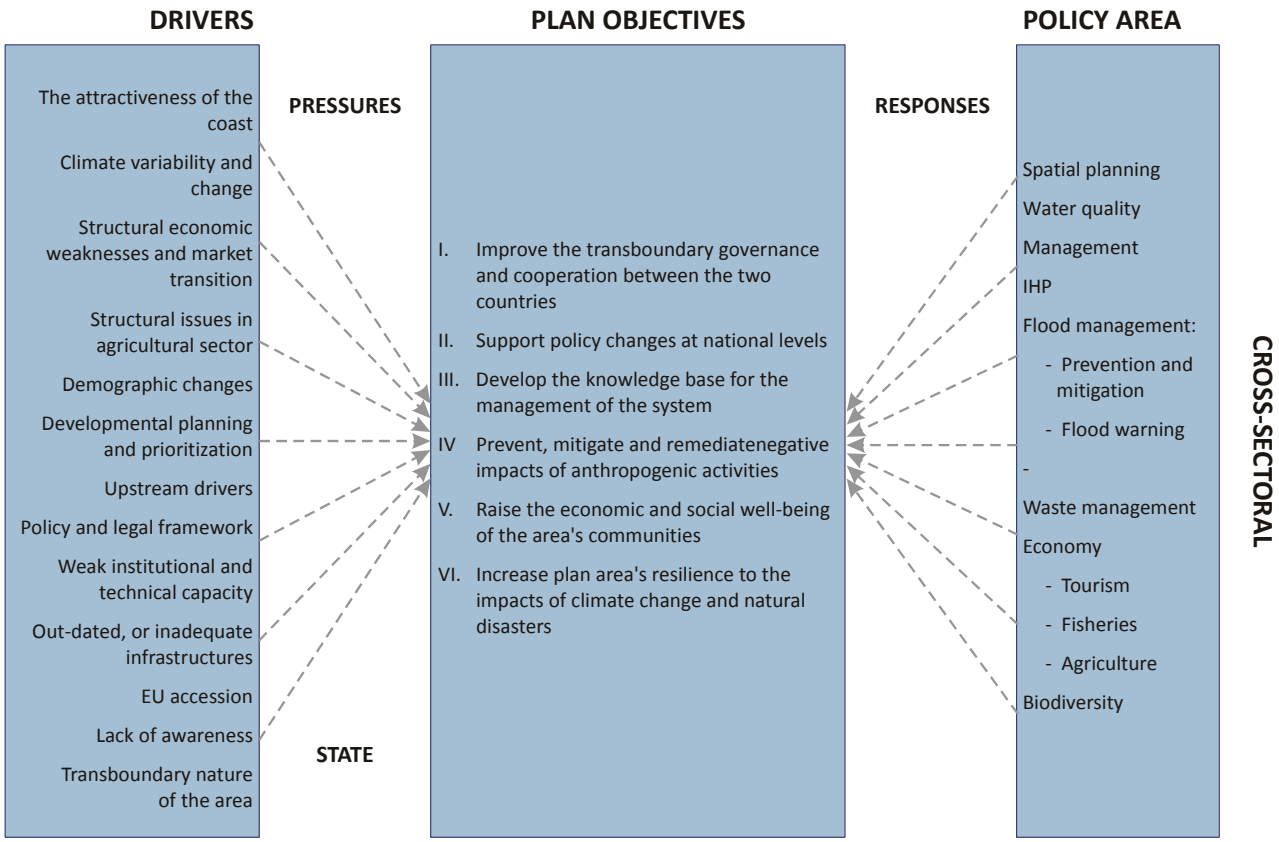


Figure 7.4. The Buna/Bojana "bow-tie"

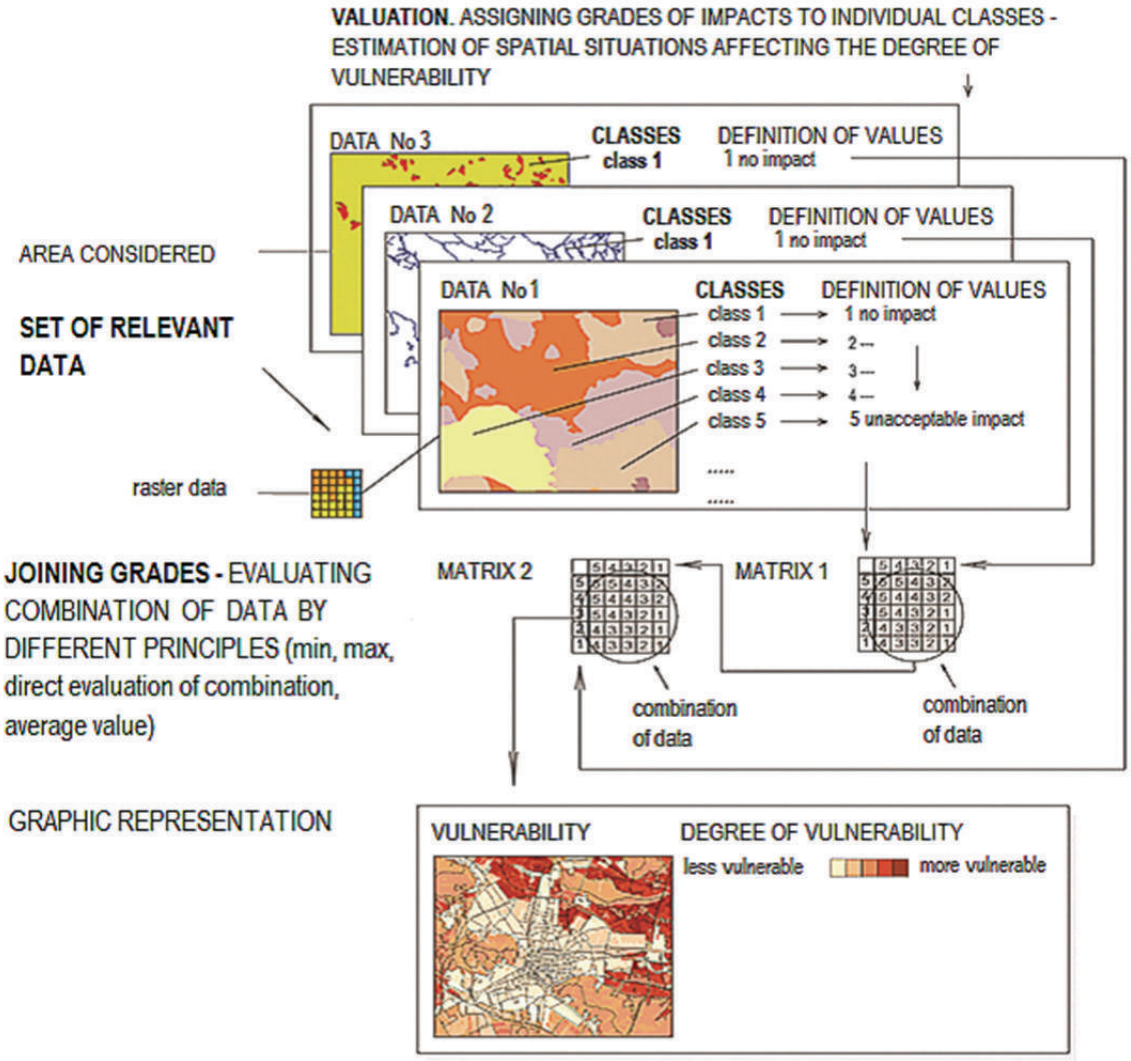


Figure 7.5. Principle of development of vulnerability model

For example, these maps are well adapted for handing and communicating information about the intrinsic vulnerability of coastal aquifers, and also for other systems, if this is required.

Vulnerability assessment, if coupled with existing and potential land use and consideration of the various potential human activities likely to occur in the coastal zone, can be used as a decision-making tool by identifying (in)compatibility between human activities and the land on which they occur and by identifying remediation measures.

Lesson: Vulnerability assessments from Buna/Bojana (Albania and Montenegro), the Ghar El Melh lagoon (Tunisia) and other cases

As part of the CAMP Montenegro an assessment of vulnerability has been prepared, not as an independent assessment *per se* but as a baseline, for preparation of the coastal area spatial plan, as well as for the national strategy for ICZM. The assessment determined the most valuable spatial units that should be preserved from future degradation (i.e. those spatial segments unsuitable, or less suitable, for designation for certain activities or interventions). In addition, the results were used to identify conflicting zones between areas of high vulnerability and areas planned for construction (Figure 7.6).

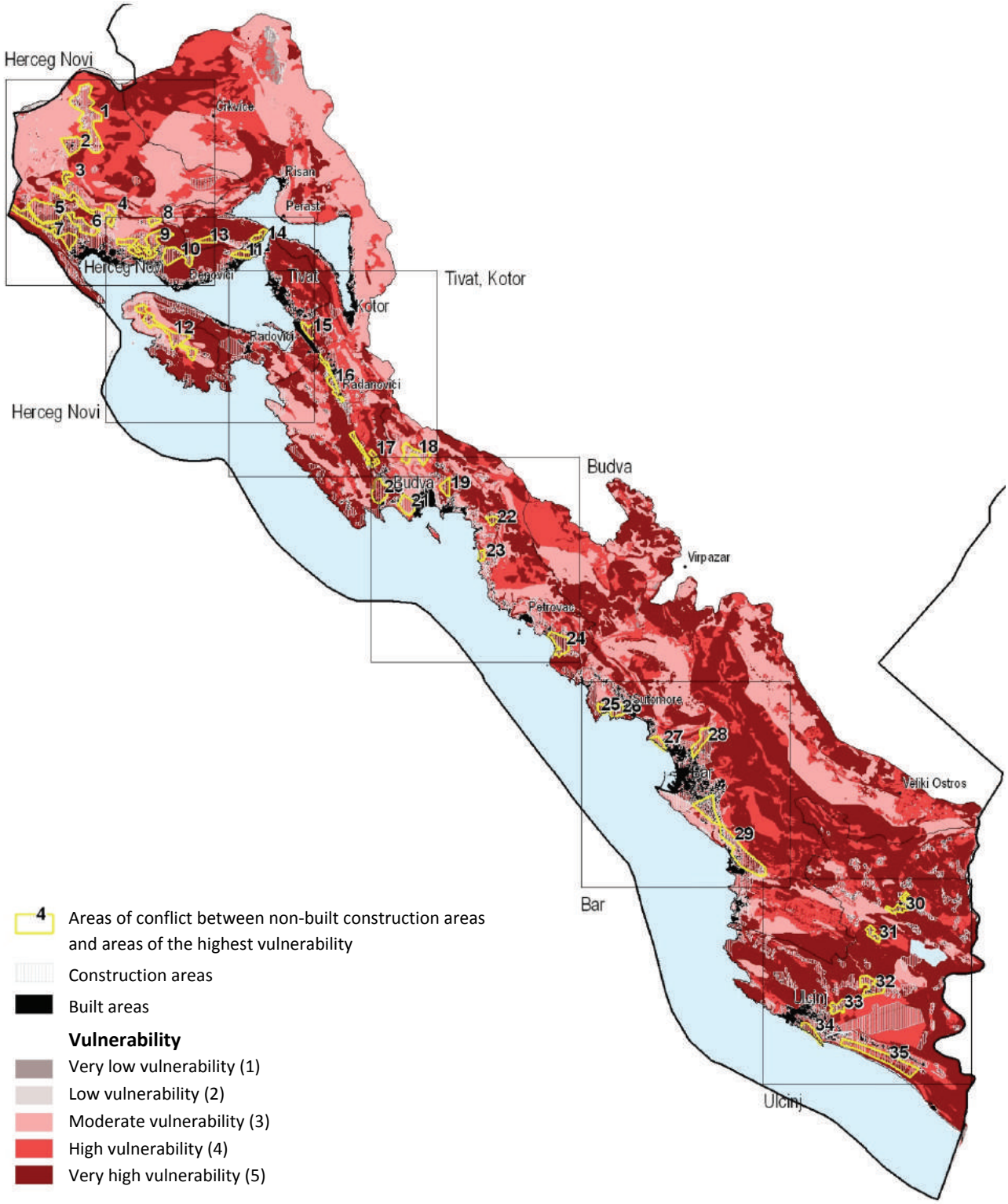


Figure 7.6. Areas of conflict between non-built construction areas and areas of the highest vulnerability – coast of Montenegro

Results of the vulnerability assessment for CAMP Montenegro were used in the preparation of the coastal area spatial plan mainly by location changes for given interventions and definition of alternative solutions for determining land uses. To some extent, proposals for technological improvements (changing existing technologies and introducing advanced technological alternatives) were also applied. Two similar applications of the vulnerability assessments were prepared for CAMP projects in Slovenia and Spain.

Another example of application of vulnerability assessments can be derived from a pilot demonstration of coastal zone use capability with respect to coastal aquifer integrity carried out as part of MedPartnership in the Ghar El Melh lagoon in Tunisia (Table 7.1; Figure 7.7). The assessment simultaneously estimated the vulnerability of this coastal aquifer to land-based sources of pollution and seawater intrusion. The assessment of comprehensive vulnerability was followed by an additional analysis of the potential environmental degradation that could occur from land-based human activities. A matrix was prepared to show the degree to which these activities may or may not be compatible with the geological properties of the underlying aquifer.

Table 7.1. Example of a matrix in the pilot demonstration in the Ghar El Melh lagoon, Tunisia (Table copyright, 2015, Andrea Merla)

Vulnerability map units			Activities									
Land unit	**Geology**	**Comprehensive vulnerability of coastal aquifers**	**Fish farming**	**Solid waste disposal**	**Surface disposal of untreated liquid wastes**	**Heavy construction**	**Excavation and extraction of natural materials**	**Devegetation**	**Use of herbicides, pesticides, insecticides**	**Irrigation**	**Cemeteries**	**Groundwater abstraction**
Northern slopes	Permeable sands and calcarenites	**Medium**		**O**	**O**	**O**		**X**	**X**		**O**	
	Impermeable Maris and clays	**Low**										
Coastal plain	Recent alluvial deposits and beach sands	**High**		**O**	**O**	**O**	**O**	**O**	**X**		**X**	**X**
Estuary	Deltaic deposits at sea level	**Very high**	**X**	**XX**	**XX**	**XX**	**XX**	**X**	**XX**		**XX**	**XX**
Coastal wetlands	Salt water marsh			**X**								

Significant problems unlikely	
Undesirable: problems likely	**X**
Undesirable: significant problems likely	**XX**
Possible problems	**O**
Not applicable	

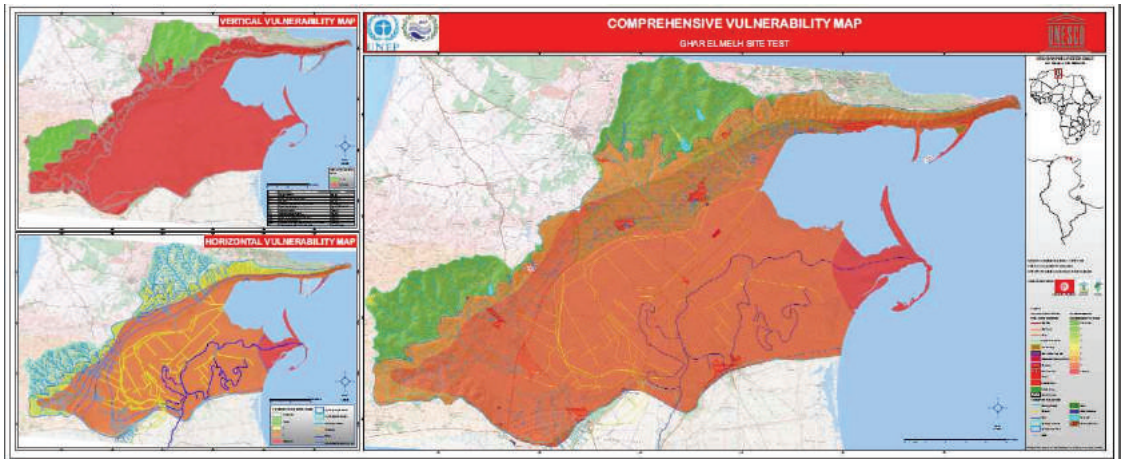


Figure 7.7. Vulnerability map from the Ghar El Melh lagoon pilot project. Link to high-resolution version of vulnerability map for Ghar El Melh: www.geoprospezioni.it/gharelmelh/GharElMelh_Vulnerability_Map.pdf. Accessible with the password "UNESCOGharElMelh" (Map copyright, 2014, Salvatore Carrubba)

UNESCO-IHP has undertaken a number of pilot projects in the Mediterranean to demonstrate the use of new tools to help countries improve their understanding and management of precious coastal groundwater resources. One of these pilot projects involved the use of hydrogeochemical techniques to study the processes affecting groundwater quality and salinization in the Bou-Areg coastal area and the Nador Lagoon in Morocco. In addition, a series of pilot projects on aquifer vulnerability mapping provided concrete examples of vulnerability assessments in the context of karstic aquifers (two case studies in Croatia) and in aquifers under the influence of saltwater intrusion (one case study in Tunisia). Finally, the role of groundwater in sustaining coastal ecosystems is being documented at two sites in Lebanon, where researchers are studying the water feeding regimes in coastal wetlands and investigating changes in climate and hydrology in the area.

7.3.2 Exploring futures: scenarios, pilot actions and potential funding

This is a preparatory step before setting the vision. In some cases this step is not considered separately but as an integral part of setting the vision. In other cases it could be considered as part of the previous step of building the evidence. In fact, it is the bridge between the two.

Based on the building the evidence stage and the resulting diagnostic report in this step the task is to analyse several scenarios in order to identify the possible future options. The final configuration of the vision is determined by selecting a relatively small number of representative and promising alternatives for detailed analysis.

Scenarios – alternatives, "what if?" visions of the future – and the process of generating them are to be used as a key part of the plan's development. Scenarios are also to be used to:

- provoke debate about common futures
- expand the range of options
- expose contradictions and conflicts
- clarify and communicate the technical analysis
- expose uncertainties for future state and developments
- evaluate policies in the face of an uncertain future
- create ownership.

In other words this is a step where forecasting and backcasting are confronted, compared and possibly combined through scenarios. Scenarios and the process of scenario development should engage the imagination of both the planners and the

stakeholders. Their value should be in widening the participants' perception of possible future events and possibilities and encourage "thinking the unthinkable".

There are many variations for the approach of this stage including all, or some, of the following: scenario building (forecasting/backcasting), pilot actions and exploratory work on funding.

7.3.2.1 Scenario building

Scenarios should be driven by, on one hand, a combination of aspirations and, on the other, projected trends. The former is practically shaped and reflected in the drafting of the plan through backcasting (see chapter 7). The latter can be generated through a combination of factors such as demographics and economic growth, with plausible alternative political, social, technical, legal and environmental trends (forecasting/projections on the current situation) as key variables. Future trends will inevitably be speculative, but whenever possible they should match or approach those predictions used by sectoral decision makers and will therefore be more "likely" than "desirable" trends at this stage.

When developing a scenario, transboundary or external (upstream to river basin and downstream to the sea) challenges and opportunities have to be considered properly. Climate change scenarios should also be part of the integrated scenarios for the plan area.

Asking what actions are required to mitigate the negative, or reinforce the positive aspects of the likely scenarios can then inform the development of the plans. Finalization of the scenario to be considered in the final integrated plan may require adjustments based on various combinations of tactical options, which can be implemented within the existing scenario framework, and structural options, which require fundamental changes to the existing scenarios.

There are many variations of scenario-producing processes, but they can be placed between two extremes:

1. A limited number of expert top-down scenarios generated formally by the planning team and subject to a formal consultation – often consisting of "high" and "low" intervention options
2. A fully participative process involving facilitated workshops, etc., at which participants may come with their own "agreed" scenario based on aspirations and opportunities. A number of the most visible constraints, as perceived by the public, are imposed. Few constraints are placed on the number or range of alternative scenarios generated. It is important to note that scenario making is not, per se, a decision-making process. It may simulate decisions, but actual decision-making can take place only in the planning process.

Indicators may be used to help to assess the expected impacts of the alternative scenarios in terms of costs and benefits, recognizing and accepting that in most cases these are speculative. The degree of sophistication applied to the technical evaluation of alternatives through, for example, coast-benefit analysis, will be dependent on the resources and expertise available. Risk indicators may be also included and play an important role in the alternative analyses.

7.3.2.2 Pilot actions

Pilot actions are one of the proposed tools used for securing stakeholder and public "buy-in" to the planning process and the integrated plan. The execution of pilot actions –- especially eye-catching, showcase projects – can be one of the most important tools to demonstrate the benefits of collaborative action to the area. They may run in parallel with the planning process initiated usually around this stage and are delivered or assessed during the drafting of the plan (see chapter 9). Pilot actions and small-scale demonstration projects could be designed to:

1. give real, practical and visible substance to the planning process
2. build trust and capacity by engaging a wide variety of stakeholders in collaborative activities
3. test and enhance the local potential for future interventions.

Community-based pilot actions can take many forms: data collection and local knowledge-sharing; awareness-raising events; or even the construction of relatively small-scale concrete actions. In particular, the actions should test the benefits of an integrated approach. Their inauguration or the presentation of their results can be linked to wider events such as the annual Mediterranean Coast Day or Global Water Forum. There is no set/accepted technique for selecting or implementing pilot actions. Such actions should be closely adapted to the local cultural context plus the local capacity for such projects.

However, the quality, usefulness and cost-benefit of these actions should be unquestionable because otherwise they may become counterproductive to the planning process.

Key criteria for selecting the right project as a "pilot" can include:

- Relevance
- Response to urgency and/or demand by the public
- Integrative nature
- Timeliness
- Duration
- Manageability and community involvement
- Cost.

Example of pilot: During the planning process and preparation of the scoping report of Lake Bizerte under the Horizon 2020 Initiative to de-pollute the Mediterranean by 2020, and while preparing for the vision/charter of Lake Bizerte as a pilot project, the construction of a fishing port was carried out which also helped the fishermen's buy-in to the plan.

7.3.2.3 Exploratory work on funding

It is important, at this stage, to perform a preliminary identification of key potential funding sources for the subsequent realization of the vision and implementation of the plan. Although the action plan will not yet have been elaborated, the identification of potential major funding sources will help create favourable preconditions for the delivery of the results of the planning process, by linking them with the results of scenario development. If a specific scenario has the feasibility of its implementation tested through identification of potential funding sources it could be considered, then, as more realistic and included in the priorities of the plan by:

1. ensuring that the proposed actions are realistic and deliverable
2. reducing the time gap between plan and actions, thereby maintaining momentum, stakeholder confidence and support.

Chapter 8:
Stage 3 – Setting the Vision

8.1 Aim and objectives

The overall objective of the setting the vision stage is to engage stakeholders in the joint vision for the plan area, and to set the course for the eventual shape of the plan and its implementation. From a selected set of alternatives the team, in agreement with stakeholders and based on the necessary trade-offs between different interest groups and uses, will propose the optimal long-term vision.

A vision should be both rational and inventive: "Prospective is above all an attitude of mind (…) and a way of behaving (…) If it has no future direction the present is empty of meaning (…) The rational and the inventive trends of strategic planning are complementary, only prima facie they seem opposite" (Godet, 1987).

The vision should include, or be complemented by, a set of goals so we know what we want to accomplish, who are committed to this vision and eventually how they will contribute. The "when" and the "what" will question how much it will cost and what the consequences and benefits will be.

8.2 Key tasks

1. Building consensus – reaching agreement among stakeholders and the wider community on the key problems, issues and priorities for the plan area
2. Preparing the vision statement (setting the direction) – observing the priorities and the consistency of the objectives of the plan
3. Measuring success – selecting the necessary set of (at least preliminary "core") indicators to measure the success of both the planning process and its outcomes.

8.3 Expected output

The format of a single vision statement may respond to local culture and specificities, as well as to the stakeholders involved. It may, for example, include priorities, objectives and key commitments supporting interpretative material and reports of the participation process, as well as an indicator matrix (to be populated throughout the following stages of the plan preparation and its implementation).

8.3.1 Consensus building

8.3.1.1 Enhancing clarity/systematizing the vision

Stakeholders identified in the stakeholder mapping and analysis that was performed in the establishment stage, and then approached, informed and trained through the preparatory steps described previously, should now be fully aware and active. This will allow them to filter, validate and amend the issues (confirmed and further developed during the analysis and scenarios stage) arising from the scoping report, with the aim of identifying priorities that are "negative" (unsustainable) and "positive" (desired and agreed as needed). The objectives of consensus building are to:

- validate and, if needed, amend the analysis report based on stakeholders' reaction
- identify the interlinkages between drivers, pressures, state and impacts in a DPSIR framework, and to agree on the key management responses;
- refine a shared set of priorities.

This process also has to decide which alternatives are optimal/preferred (and eventually rate the other options), particularly in terms of selecting criteria, and has to answer the "why" question. At

this stage a better understanding/rationalization/ distinction between vision, goals and objectives and their relationship has to be obtained. Stakeholders should be reminded that objectives are means to fulfil the goals, while the goal is the explanation and concretization of the vision. Objectives will describe in measurable terms the desired end state of the plan and could provide the measure of the plan's performance.

8.3.1.2 Bottom-up versus top-down priorities

At this stage, effort should be made to reconcile the community-based (bottom-up) priorities with those originating from top-down approaches at a higher governmental or sectoral level (river basin, environmental, socioeconomic, etc.) Ideally, these two should be mutually supportive where, for example, community concerns relating to local seawater quality are reflected in a statutory requirement to meet national or international standards or groundwater quality. Equally, however, priorities may conflict (e.g. between tourist development/top-down and conservation of biotopes/bottom-up). Open spaces may be required for flood detention and retention purposes leading to urban expansion restrictions in adaptation to climate change (top-down decisions). These may be confronted by local group interests to maintain or expand activities within the areas that may potentially be affected by floods (a bottom-up reaction). Similarly, top-down/bottom-up conflicts are common in respect of groundwater abstraction restrictions, etc. A further refinement or consolidation into a shorter number of headline issues may aid objective and indicator selection in later stages.

8.3.2 Setting the direction (preparing the vision statement)

Setting the direction, or preparing the vision statement, will define the desired or intended future state, function and services of the plan area. The vision describes in simple terms the condition of the plan area in the future, in a timespan of 10-30 years and even beyond, if the plan is implemented successfully. Ideally the vision statement should be:

- Clear and compelling
- Aligned with plan partners' and the community's aspirations and existing policies
- Ambitious and memorable
- A vivid picture of a desired but doable future.

Apart from recognizing positive and negative priorities the vision statement may list objectives derived from the agreed priorities. Objectives may be further expanded to describe how the implementation of the vision statement can be measured, and will reflect the governance and /or major follow-up steps. It means that vision should try, as far as possible, to be politically and technically feasible, and also environmentally sound, socioeconomically acceptable and legally permissible.

Classically, the objectives should be measurable, attainable, realistic and time-targeted. Beyond this simple description, however, the objectives can become more ambitious and complex, distinguishing between high-level objectives (or goals) and clusters of sub-objectives (Table 8.1).

Many objectives may be predetermined in existing international, national and subnational policies that are linked in many ways with the plan and they are also connected with specific indicators; examples include "Horizon 2020", the WFD, the MSFD and IMP. In many cases these adequate benchmarks should be taken into account as they provide a useful basic set of objectives and indicators. However, they should be reviewed to make them relevant to the plan area and also in order to identify the potential to exceed them. For climate change, for instance, a clear statement is needed of the importance given to adaptation to climate change as a high-level objective/goal. This can be followed by a list of the areas where action is seen to be required, and the cross-sectoral priorities (e.g. adaptation to climate versus short-term development imperatives).

Table 8.1. High-level objectives, sub-objectives and relevant indicators
Source: Adapted from A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management (IOC Manuals and Guides 46. ICAM Dossier, 2. Paris: UNESCO, 2006).

	Indicator type	Human pressure				Pollution				
Example of objective/ indicator matrix	**Indicator desription (not including measures)**	Land use and composition	Population and tourist capacity	Extent of hard surfaces	Unlicensed fishing and hunting	Population served by wastewater treatment	Volume, number and type of point-source discharges	Non-point-source nutrient loading	Discharged sediments and nutrients	Litter and waste
HIGH-LEVEL OBJECTIVES	**SUB-OBJECTIVES**	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**
A healthy and productive economy	Maximizing economic development		**X**							
	Increase employment	**X**	**X**							
	Foster economic diversification	**X**								
A healthy and productive environment	Minimize habitat destruction and alteration	**X**		**X**	**X**					
	Reduce volume of all types of pollutants			**X**		**X**	**X**	**X**	**X**	**X**
Public health and safety	Protect human life and public and private property									**X**
Social cohesion	Maintain equitable population dynamics	**X**	**X**							

8.3.3 Measuring success: indicator selection

In preparing an integrated plan a set of governance, environmental and socioeconomic indicators, which align with the objectives, should be prepared to determine whether the plan interventions are achieving their intended objectives and to measure the performance of the measures implemented. Effective monitoring and evaluation is an indispensable tool in the planning and implementation process. Indicators serve both as a corrective function during the planning cycle, enabling adjustments, as a guide to structuring implementation effectively and as a communication tool. The selection of indicators may be considered as a stand-alone step or combined with other stages.

The reason why the selection of indicators step is presented under this stage is not only because of its relevance with objectives. Indicators, and particularly those linked with the successful implementation of the plan (and even if prepared and suggested by the planning steering group or committee) should, ideally, meet the aspirations of the stakeholders and be approved/accepted by them. The indicators should therefore be:

1. Clearly aligned with the objectives
2. Clearly linked to the output/outcome being monitored
3. Developed with stakeholders
4. Part of the management process and not an end in themselves.

In selection and implementation of indicators one should start with those required by the laws, international conventions, frameworks and any other kind of agreements and those required by other sectoral management provisions. Having in mind that integrated plans encompass coastal areas, river basins, aquifers and groundwater the number of potentially suitable indicators will be large, so it is important to define criteria for selection and use of the most appropriate/ needed/useful ones.

8.3.3.1 Relationship of indicators to objectives

The matrix of indicators will become a core of the plan, quantifying the objectives and ultimately measuring the implementation of the plan. They will also play an important role in:

- Quantifying the objectives
- Evaluating options – providing a checklist to measure plan outcomes both positive and negative
- Measuring the implementation of the plan
- Reconciling the long- and short-term horizons – measuring short-term outputs against long-term outcomes.

Different types of indicators can be used, such as input, output and performance indicators, provided that they are able to indicate if "we are doing the right thing" and if "we are going about the right thing in the right way". One of the suggested options is to use:

1. Sustainability indicators: measures to show that the plan purpose is realized – long-term outcomes.
2. Impact indicators: measures to show that the plan outputs are achieved – medium-term outcomes.
3. Performance indicators: measures to show that project activities are undertaken – short-term outcomes.

These must be visible, understandable and even "monitorable" by the public themselves (e.g. with mobile phones/social networking).

The identification and collecting of data for indicators can appear daunting. However, a simple, preliminary ranking of relative importance of the three types of indicator in relation to the ease of gathering will assist the allocation of resources to this task.

8.3.3.2 Indicator hierarchy – headline and specific indicators

It is important to remember that monitoring based on indicators is an expensive business. Too many indicators are not only expensive to follow but may aggravate rather than help the process. A limited suite of indicators is required: headline indicators and specific indicators. The detailed specific indicators may be appropriate for a technical audience or for core and funding partners; for a wider audience, specific indicators are not needed and may be considered meaningless and obfuscating.

A further refinement therefore will be to select a limited number of headline indicators to effectively report trends to a non-technical audience on sustainability, impact and performance. These in turn should be presented in a way that quickly conveys a picture of progress across the plan. In many cases the indicator data are condensed into simple graphic forms such as emoticons (e.g. smiley faces), traffic lights or other images, ordinal ranking scores (1st = worst, 5th = best).

The prime function of headline indicators is communication and transparency, so which are the best-understood indicators to convey the overall progress of the plan? Which indicators will have an emotional resonance with the target audience?

8.3.3.3 Assessing Indicators

The indicator may be measurable in an accurate way, and assessed; non-measurable indicators, however, may be assessed by their quantitative and qualitative attributes. Indicators needed for the plan are always combinations of these two types. The complexity and number of indicators will vary according to the nature of the area and the

resources available. They should, however, include governance, environmental and socioeconomic indicators that align with the specific objectives of the plan.

The climate change indicators identified earlier, and included in the analysis and scenarios stage, will be part of the overall set of plan indicators. Then, as the plan is implemented (see stage 5 in chapter 10), eventual changes in the set of indicators are possible. This need not be done too frequently, as the indicators should not change that easily. For the climate indicators, calculations at regular (e.g. 5-year) intervals should be acceptable. The estimation of the appropriateness of indicators is carried out as part of the implementation of the plan.

Chapter 9:
Stage 4 – Designing the Future/the Plan

9.1 Aim and objectives

This is the most important formal stage of the planning process: the actual drafting and finalization of the integrated plan which it is hoped will shape the future of the entire plan area.

The ultimate aim of this stage – and, indeed, of the whole process – is to lay the foundations for management that promotes and supports a self-sustaining process of SD. It will be based on a combination of instruments including concrete actions to be achieved through an investment portfolio, awareness-raising and eventually capacity-building, institutional adjustments and policy changes. These will ultimately transform, adjust and improve the governance, structure and culture, and also the community's understanding and care for the plan area. At this stage, the investment portfolio is expected to include location and capacity for structures and measures, costs, benefits, risks, etc., for the selected alternative. It is at this stage that the process shifts from analysing, consulting, planning, etc. to catalysing change: making things happen. It should always be remembered that the plan should be politically, technically, financially and legally implementable and socially acceptable.

9.2 Key tasks

1. Formulating the integrated plan and pilot actions (activities and assignments) that may facilitate the drafting and implementation of an action workplan – evaluating, simultaneously, the planning process and programme formulation
2. Establishing governance and management structures – setting up the intersectoral management, facilitation and consultation structures for the long-term, post-plan period
3. The cross-sectoral integrated management or governance structure tasked with the implementation and review of the plan with TORs and clear lines of responsibility and reporting
4. Embedding – obtaining formal approvals for funding wider institutional support and legal adoption.

9.3 Potential outputs

The potential outputs of this stage include the following:

- Integrated plan (consultation draft)
- The implementation (work) programme/road map
- Public consultation material and final consultation
- The approved integrated plan.

9.3.1 Integrated plan (consultation draft)

The draft plan should be the logical output of the preceding processes. The integrated plan (draft) sets a number of objectives that should be achieved in order to fulfil its aim. The objectives will then be divided into several measurable and achievable targets (Table 9.1). The plan will outline the resources to be targeted, who are responsible for the actions, what actions are needed, how they will be managed and how to implement them, in order that sustainability is achieved and the available resources can benefit future generations.

The plan should include, necessarily, definition of the management area and the proposed long-term governance and implementation structures.

Table 9.1. The measures grid – from the Buna/Bojana Plan (example only)

Objectives	Specific objectives	Outcome indicators	Measures	Priority actions 2015-2020
1. Improve transboundary governance and cooperation between the two countries	1.1 Establish appropriate mechanisms so relevant issues of transboundary importance are considered and acted upon bilaterally	Coordination mechanism in place The Skadar/ Shkoder agreement between Albania and Montenegro Buna/Bojana Accord endorsed	1.1.1 Develop a form of transboundary coordination mechanism for implementation of plan objectives	1.1.1.1 Feasibility study to look into options for a governance framework (coordination mechanism)
				1.1.1.2 Undertake official consultation process to discuss feasibility study
				1.1.1.3 Detailing feasibility study based on preferences by the two countries; detailed road map to establish most appropriate transboundary coordination mechanism
				1.1.1.4 …….
			1.1.2 Develop joint transboundary action programmes and projects for Buna/Bojana area	1.1.2.1 Prepare and endorse Buna/Bojana Accord indicating main fields of cooperation
				1.1.2.2 Prepare transboundary project proposals and submit for adoption
	1.2 Raise awareness and improve communication of the plan area's natural and cultural values, potential threats to it and development opportunities	Materials produced Campaigns organized	1.2.1 Develop common interpretive material for Buna/Bojana as a whole (on natural and cultural heritage and development potentials)	1.2.1.1 Develop and maintain shared website for the whole area
			1.2.2 ……..	1.2.2.1 …….

Note: Dots indicate that there are data for these cells but they have not been entered in this example.

Definition of the plan area

More specifically, the plan area and the preferred trajectory of change should be clearly identified based on the approved vision, including its terrestrial and freshwater parts, water resources and aquifers (river sub-basin), transition and marine areas, as described in previous stages. It should complement and not replace existing spatial and other plans or programmes for the area.

The integrated plan will also contain:

- A mix of proposed "soft" tasks such as changes to laws and procedures, regulations, pricing, institutional development, training, awareness-raising and other soft interventions (i.e. enabling a framework)
- Consistent measures and programmes of measures eventually inspired or initiated by other compatible parallel or management approaches already in the pipeline (e.g. for achievement of GES of all waters) referring to the same geographical area.

Proposed long-term governance and implementation structures

Governance structures will not necessarily be the same as those responsible for the preparation of the plan. Critically, these should include all key national and local agencies that can enable or facilitate delivery of the plan and implementation of the actions proposed.

As explained in previous chapters, appropriate governance could greatly and essentially support and implement an integrated plan and promote SD. Through adaptive management it could improve, refine, perfect and strengthen even an incomplete or weak plan and make it truly integrated, while a poor governance could destroy and make ineffective even the best drafted and brilliant plan.

Appropriate governance will be effective with coordination among competent ministries, regional and local authorities and with the involvement of stakeholders.

For the appropriate governance structure/ architecture please consult 3.4.3 of section I (governance schemes). Experience has shown that appropriate governance works both horizontally (bringing together line ministries or their regional branches, such as the ministry of environment, of water resources (if separate), ministry of mercantile marine development and economic ministries); and vertically, starting from securing endorsement of the plan at the highest possible administrative level. For example, it might begin with a presidential degree or a joint ministerial decision, or consignment by ministers with other parties, and move to country/sub-regional/prefecture authorities, as well as to unions of local authorities/city councils, professional associations, investors, chambers of commerce and industry, NGOs, academia, etc. Most probably a core/inner circle could act as the executive body and a wider circle may form a council, meeting less frequently, and/or a consultative advisory committee (body) with wider participation (Box 9.1).

Box 9.1. Examples of governance and implementation structures

In the case of Lake Bizerte, for instance, the charter was co-signed in a public ceremony by all line ministries, international organizations and donors, as well as by all regional and local authorities and stakeholders/NGOs and media. Following that, a "cellule" of competent authorities was established and physically installed in the region to coordinate the plan and the related follow-up activities.

In the case of the Drin River, when agreeing the vision step the planning process obtained the formal and ceremonial co-signing of an MOU by the riparians. This established, under the ministers, a core group with a secretariat and two expert groups to contribute to the finalization and implementation of the action plan (de Châtel *et al*., 2014).

Experience has shown that, in many cases, collaboration fostered during the planning process between the initiator authority/body and the core group can create the nucleus of a well-functioning governance scheme, with public acceptance and support that could be politically endorsed and formalized together with the adoption of the plan. In any case, a mandate of a few years for the governing body is usually agreed at the endorsement stage, renewable upon review and approval of progress obtained.

9.3.2 The implementation programme/ action (workplan)/road map

The integrated plan will contain an implementation programme. The implementation programme, which may have various names such as action plan, workplan or road map, aims to secure the realization of the plan through concrete actions, allowing its success to be measured with a set of indicators. The road map could define specific periods: short (3-5 years), medium (5-10 years) and long term for implementation of the proposed undertakings. It should also provide for designation of responsibilities for delivery, how costs will be shared and lines of accountability.

The implementation programme (it comes under any of the previous names) will specify responsibilities for action, how costs will be shared, lines of accountability and channels for exchanging and distributing information. The integrated plan will most likely contain operational details about a mix of infrastructure, maintenance and non-structural tasks such as changes to laws and procedures, regulations, pricing, institutional development, training and other soft interventions already specified briefly in the integrated plan. It should not be a wish list of projects but a cluster of well-programmed interventions with time frames, budget, distribution of tasks and clearly defined expected outputs.

9.3.3 Public consultation material and final consultation

As soon as the final draft is ready and reviewed through the competent internal procedures (e.g. by the steering group or committee) it can become public and available through electronic media and eventually in hard copies to the competent partners and stakeholders, as a draft to collect the final series of comments. The format and details of the widespread consultation depend on local conditions and the participating culture. Following this step, there are two options depending on the political culture of the country/region. Either the amended (final) draft, together with the "response" document will become available again electronically and presented in a public meeting where, hopefully, the draft will be approved with minor on-the-spot amendments and then it will be forwarded for formal approval to the authorities at higher level. Alternatively, the public meeting could be omitted, although the former is the preferred procedure.

From this it becomes evident that the consultation support material needed are: the plan (draft), the consultation response statement together with a flyer/document explaining all the previous consultation steps followed, the type (or even names) of the institutional stakeholders involved and the vision statement (which should normally be in the introduction of the draft integrated plan).

In completing the consultation, it is useful to compare the content of the final draft against a checklist and, if needed, fill any of the identified gaps.

A tip from experience: In some cases when, at the last minute, a group of stakeholders or even one of them does not accept the consensus or wishes to differentiate with the plan, we may give them the chance to issue a statement with their views that the organizers of the meeting will circulate together with the other documents. This move will ensure the smooth continuation of the procedures while ensuring full respect of democratic participation and will facilitate wide adoption of the plan.

The checklist makes sure that the plan:

- locates and activates existing responsibilities, capacities and interests related or relevant to plan area management tasks and brings them together in an environment where problems, issues and actions can be addressed in a coordinated way
- provides linkage and access to institutional expertise and experience in an issue-specific context
- provides for the dissemination of information about and by the plan as well as creates awareness related to the plan area management issues
- promotes the multidisciplinary approaches required in truly integrated management
- provides opportunities for training by doing
- initiates and reinforces the formation of an institutional and personalized network of bodies and/or individuals with responsibilities related to ICZM, IWRM and aquifer/groundwater management
- makes the plan a local product generated through the work carried out by the existing government machinery and supported by the stakeholders within the plan area
- provides manpower, resources and capacities to carry out the numerous and demanding tasks required by the plan.

Furthermore, in order to build confidence in the plan it is worth reviewing, at this key stage, whether the following questions have been answered:

- Have the right issues and problems been addressed?
- Is the vision on which the plan is based universally shared?
- Have unenforceable planning and management options (legal, political, societal, financial) been eliminated?
- Have the major stakeholders been engaged and their interests adequately identified and reflected?
- Is the scale and the geographic extent affected by the issues and system boundaries adequately defined and properly agreed?
- Is the initiative politically realistic and the route for formal adoption by the appropriate national or regional bodies secured?
- Have adequate sustainable funding options been identified?

9.3.4 The approved integrated plan

The steering group or committee should approve the final document, which has to be adopted by one or more ministries or by local authorities at the appropriate level. It may also receive joint endorsement from a vertical combination of both. Sponsoring organizations may also be asked for or require a formal endorsement for the final document to enable it to become the approved integrated plan.

As a document, the approved plan may be structured and presented according to the traditions of each country/region. However it should, in one way or another, include the following:

- The goals and the objectives of the plan
- The formal statement of adoption by the appropriate levels of government
- A preambular part explaining the scope and process followed for its production and approval/endorsement
- The endorsement by the stakeholders
- The vision
- The context derived from the analysis, the scoping report, etc.
- Long-term policies, based on the objectives
- Governance structure to achieve integration and effective delivery
- Institutional framework for implementation; relationship and connections with other plans for the area or beyond should be also clarified

- Action plan (road map) and investment portfolio, probably on a 3-6 year basis (this may be a separate document)
- The pre-selected indicators quantified to enable measurement and monitoring of both the process and outcomes of the plan.

Integrated plans should as a rule complement, not replace, existing plans. Where spatial or other plans are in place, and they provide a legal base for development, the integrated plan should add value by providing a qualitative and dynamic dimension to spatial policies. Integrated plans may also inform the spatial planning process through a deeper analysis of specific coastal issues such as surface and groundwater resource management, climate change adaptation, coastal erosion and marine water quality, or the nature and type of appropriate areas for tourism. The same added value principle applies to other sectoral plans. Special consideration should be given to the potential of the plan to provide an MSP as explained in section I. The ICZM Protocol extends the coastal zone to the territorial limit that – in almost all situations – exceeds that of existing spatial plans or the spatial boundaries of competent coastal authorities. The approved integrated plan will make proposals for the marine zone, which ideally should include spatial planning policies, provided that the competent authorities have been involved and agreed though the planning process.

The action plan should have specific climate-related provisions. These may include measures related to sea-level rise such as sea defences and changes in land-use regulations, as well as measures derived from the areas of agriculture, tourism, health, water and ecosystems, mostly in conjunction with national policies in these areas. Integrated plans should also include flood hazard and risk maps, flood risk management plans and drought management and water scarcity adaptation. Specific to climate change will be also issues relating to funding.

External funds should be available from the Global Climate Fund (GCF), which is being set up and which will set out some guidelines for the documentation that needs to be provided for projects that are requesting funding. Much of the information to be collected as part of the integrated planning should be of great value in preparing such proposals, although further data may be required.

Chapter 10:
Stage 5 – Realising the Vision

10.1 Aim and objectives

The objective of this very important and long-lasting (ongoing) stage, where policy design shifts to the facilitation of change, is to ensure continuity and sustainability of the implementation of the plan. The inclusion of this as the fifth stage in the planning process refers to a period that will be suggested by the steering group or committee and decided by the implementing governance structure. It is important that there is a long enough (but specified) test period to closely monitor the implementation of the provisions of the plan, with particular attention to the soft provisions, in order to ensure proper feedback and, with adaptive management, to make the necessary adjustments and improvements. Integrated plans will deploy a combination of policy instruments, management processes and actions.

The way in which the vision and the plan are to be realized/implemented is of utmost importance. In section I and previous parts of section II the prospects and difficulties for fully integrated planning and its implementability have been analysed. The format of the operationalization depends on governance abilities and willingness, and the commitment and preparedness of the stakeholders to contribute actively.

10.2 Key tasks and potential outputs

10.2.1 Key tasks

The key tasks at this stage include:

1. Implementation – implementing legal, economic and spatial instruments and management processes
2. Supporting actions – awareness-raising, partnerships, financing and investment
3. Monitoring and review – regular feedback into the review of the plan, programme and its action plan.

The implementation programme should have a clear action workplan/road map, embedded into supporting funding programmes, achieving maximum "gearing" through multiple sponsors. The long-term governance structure should be in place, ready to function, soon after the announcement of approval of the plan.

Outputs and their subsequent outcomes should now be visible and monitored in the best possible way to provide feedback, but also as part of the overall ongoing monitoring and review process. Raising and maintaining public awareness will be also an ongoing activity.

10.2.2 Potential outputs

1. A plan review on an agreed timescale leading to recommendations for improvements
2. Outputs as defined in the implementation programme (including awareness-raising/ education campaigns, etc.) or its review (follow-up of 1, above).

10.3 Legal and economic mechanisms

ICZM deploys a combination of policy instruments. In most Mediterranean countries ICZM does not itself have national legal status, except where the ICZM Protocol was ratified and transposed to a national legal system. This lack of a formal legal status is both a strength and a weakness. Integration with IWRM and other targeted sectors relevant to the coast allows for such an integrated scheme to operate across a range of issues and to utilize tools and measures not open to individual sectors restricted by legal statutes. However, the lack of statutory basis leads to a potential lack of engagement in and weak support from regulatory bodies.

10.3.1 Legal mechanisms for ICZM, IWRM and aquifers/groundwater

It is important to distinguish between legislation specifically for ICZM and the use of legislation from specific sectors to achieve the purposes of ICZM together with all other important components already analysed.

10.3.1.1 Specific ICZM legislation

The ICZM Protocol in the Mediterranean (www.pap-thecoastcentre.org/pdfs/Protocol_publikacija_May 09.pdf) highlights a number of ways in which governments can provide an enabling legal framework for ICZM. These include specific provisions such as article 8 (www.pap-thecoastcentre.org/pdfs/article_8_final.pdf) requiring the establishment of zones where construction is not allowed (known as "setback"), and criteria in national legal instruments for the sustainable use of coastal zones. Other Protocol articles can only be fully implemented through action at national government level. Article 18, for example, requires the strengthening or formulation of national strategies for ICZM and coastal implementation plans and programmes. Separate guidances for the preparation of such national ICZM strategies has been prepared by PAP/RAC (http://pap-thecoastcentre.org/pdfs/National%20ICZM%20Strategy%20Guidelines.pdf), and for the establishment of appropriate institutional coordination required by article 7 (www.pap-thecoastcentre.org/pdfs/ explanatory_article_7_outline_final_feb13.pdf).

Several Mediterranean countries have specific framework legislation for coastal zones that allows for specific plans to be introduced with common ministerial decisions or decrees of prefectural/ regional countries.

10.3.1.2 Specific IWRM legislation

The most prominent and widely used legislation in integrated management, particularly for the IWRM component, is the EU WFD. Although it only relates to EU Member States it has been used as a good practice guide for many Mediterranean countries that have introduced compatible or similar legislation.

Several other directives could also provide opportunities for integrated legal implementation of coastal management for EU Member State Mediterranean countries, such as the MSP, the MSFD and the Groundwater Directive (GWD) (http://ec.europa.eu/environment/water/water-framework/groundwater/framework.htm).

It is obvious that these legal mechanisms cannot be implemented successfully unless they are appropriately integrated with full involvement of the competent authorities. This is a key prerequisite for sustainable coastal development.

10.3.1.3 Specific groundwater legislation

The EU WFD is also an important instrument for the management of groundwater. According to the WFD, groundwater is assigned to the most appropriate river basin district. The "good status" objective for groundwater concerns quantitative and chemical status. The quantitative status objectives are identified in the WFD, and the chemical status objectives in the GWD. The GWD also sets out measures to prevent or limit inputs of pollutants into groundwater.

10.3.2 Economic and financial instruments

Using economic and fiscal measures to change behaviours is a practice that is in increasing use. Market-based instruments and fiscal mechanisms provide financial incentives and disincentives to guide behaviour towards environmentally responsible activity, and mitigate undesirable activities, in an effort to reduce damage to the environment. If properly designed, these tools can effectively integrate environmental management into economic decision-making. Fiscal instruments depend on regulators setting clear direction and rules, and then allowing markets to achieve desired environmental outcomes through price signals.

Such instruments may be complex (requiring appropriate primary legislation) or relatively simple

(encouraging voluntary actions). The type and range of fiscal instruments are immensely varied and locally dependent, and their description and use go beyond the scope of the present guidelines.

Some examples shown in Box 10.1 derive from the publication of the National Center for Environmental Economics of the United States of America (NCEE, 2001).

Box 10.1. Uses of economic incentives (NCEE, 2001, amended)

- **Product charges and taxes**
  Levies on products that are harmful to the environment when made, consumed or disposed of, aiming to influence purchasing or behavioural habits. Typical examples include carbon tax, pesticide tax and levies on packaging and plastic bags.
- **User charges and taxes**
  Payments for the costs of collective services primarily used as a financing device by authorities. Typical examples are water user charges, road user charges, quarrying and mining charges, and entrance fees to parks.
- **Pollution charges and taxes**
  Requires regulated parties to pay for each unit of pollution emitted, discharged or disposed of. Generally such schemes require primary legislation and complex monitoring/enforcement mechanisms.
- **Deposit-refund systems**
  A refundable deposit that is paid on products which can cause pollution if discarded. Typical examples are beverage containers, vehicle bodies and lead-acid batteries.
- **Purchase of development rights**
  Financial compensation to landowners willing to protect the natural heritage of their land.
- **Transfer of development rights**
  Encourages transfer of development to less sensitive areas within a coastal region, while minimizing development on environmentally sensitive land.
- **Tradable/marketable permits**
  A transferable right to discharge a prescribed level of pollutants or use a certain amount of a resource. Such rights could be allocated for emissions, effluents or fisheries access.
- **Performance bonds**
  Requires regulated parties to place financial assurance with a regulator to ensure performance or against environmental damage.
- **Fiscal reform and financial programmes**
  Fiscal support for positive environmental or social outcomes. Typical examples are programmes or grants to encourage sustainable or traditional agricultural practices.
- **Environmental liability**
  Requires parties causing environmental damage to compensate those harmed.
- **Land trusts**
  Non-profit organizations established to protect and conserve important natural or cultural sites or landscapes. Land trusts range from the very local to the national, and even international scale. The term “land trust” does not exist in all legal frameworks but national parallels (e.g. *société civile des terres* in France) may provide a similar vehicle for land conservation measures. Measures used by trusts include acquisition of land or the purchase of conservation easements on the property to prevent development or other exploitation. Land trusts rely on private donation of land, easements or finance, often supported by tax incentives, but can also be vehicles for government funding through grants.

10.3.3 Supporting actions

10.3.3.1 Financing and investments

Financial accountability is essential to all public and private projects and enterprises related to the implementation of the integrated plan, including water resources activities. Responsible financial strategy is essential for the SD of the plan area and associated water resources. To achieve this, ongoing planning for adequate financing should be part of the process.

The supply of funds is critical for financial planning and funding sources have to be viewed from the perspective of both the capital and operating budgets. For the most part, water and coastal zone projects are financed from public revenues such as taxes, transfers and fees. Other relevant sources are international sources (grants and loans) and increasingly the private sector and/or Public–Private Partnerships (PPP).

Capital funds are generally considered more difficult to obtain. This problem is more central to the planning than to the operation costs, although the sustainability of the projects frequently relies on the continuity of funding for maintenance and smooth operation, etc.

There are different financing options for investments projects based on local, regional, national or international sources: assistance or development funds (regional, national, international); grants; loans and their combinations; local debt-financing bonds; local debt-financing state assistance; investment of pension funds; fee systems; lease financing and privatization and mixed schemes.

However, it is very important to take into account the lengthy and difficult process involved in preparing such projects to become “bankable” and sustainable. A recent validation carried out by the EIB and the MeHSIP-PPIF of Horizon 2020 (EC, 2013b) concluded that from inception to operation, an investment project may require between 7 and 10 years. The most important reason for delays or abandonment of a project needing secured finance is linked to a poor preparatory phase. Particular emphasis was put on the consultation with civil society and adequate definition of the project scope. During project implementation, issues linked to tendering and construction can lead to further delays. Issues linked to difficulties in ensuring a project’s financial sustainability (partially due to inadequate cost-recovery mechanisms) were also highlighted, together with the need to enforce environmental laws and put in place adequate monitoring mechanisms.

For the operating budget, fees and dedicated tax revenues are quite common. “User-pays” and application of the “polluter-pays” principle are common practices in EU Member States. Some of them have been legally introduced/supported.

10.3.3.2 Awareness raising and partnerships

"Tell me, and I will forget. Show me, and I may remember. Involve me, and I will understand” (Confucius, circa 450 B.C.). This simple but smart statement clearly shows the direction of action for awareness planning and capacity-building.

"A fully aware, well informed and properly trained population is the best guarantee of safety and of successful response to any disaster."

UNEP DTIE, 2005

Enabling framework or preconditions required to successfully implement the Plan consist in supporting structures and systems creation (such as governance structures, ICZM Protocol adoption, National Coastal Strategies definition, coastal legislation) and capacity building for ICZM (training, research, data & information and public awareness).

Shipman *et al.*, 2009

Awareness-raising is a broad and somewhat vague term, yet one that is almost intuitively understood in most societies and cultures. To raise awareness of something – good, bad or indifferent – is to promote its visibility among stakeholders and within a community and society at large. To raise awareness is also to inform and educate people about a topic or issue with the intention of influencing their attitudes, behaviours and beliefs towards the achievement of a defined purpose or goal (Scoullos and Malotidi, 2004). It is also closely linked and, in a way, a prerequisite for active PP and involvement. SD of a coastal zone is difficult and may be also costly. It may require realization of expensive infrastructure investments but also a set of soft measures aiming either to promote, facilitate and speed up a particular intervention (targeted capacity-building) or the change of culture towards sustainability (overall awareness-raising). Sustainable natural environments and sustainable built environments cannot be achieved without implementation of such measures, without real engagement of the public or without a change of culture in society's relationship with the environment – something requiring both top-down and bottom-up approaches.

Awareness-raising is considered, depending on its character (where and how it is delivered), as informal or non-formal education. In fact, Education for SD (ESD) including, of course, the formal variety within schools and other educational institutions, has been recognized as the prerequisite for SD. There are many programmes and projects on awareness-raising and ESD in the Mediterranean region, many of which also refer to coastal zones or are focusing on them. There is also considerable expertise in programmes and networks specializing on ESD issues (such as Mediterranean Education Initiative For Environment & Sustainability, MEdIES) as well as rich educational and awareness material that can be used, in many cases downloadable from the Internet at no cost (www.medies.net).

Awareness-raising may cover a range of activities: anything that involves people understanding, learning or doing something new; visioning the future; working out how to change something in their lives; or talking to someone else about what they have done. All are part of the process of raising awareness about the need for sustainable coastal zone development.

Any model of awareness-raising or campaign planning should be a tool to stimulate discussions and innovations in the design of the process. Understanding the process of change is a key tool in designing effective awareness-raising activities. Awareness-raising need not always be about speaking and telling people things; listening is also an important element. It is important also to design awareness-raising activities for different audiences but also to design your messages in a way that is meaningful for everybody. Working in partnership with competent organizations for awareness-raising can help (www.medies.net/staticpages.asp?aID=385). This will also allow everyone involved to learn a little about each other's strengths and skill in the area (Scoullos *et al*., 2002; Hopkings, 2011).

Campaigning is often less well understood and may be seen as a broadly organized effort to change practices, policies or behaviours. It is based on the ability of stakeholders to communicate the same message to a variety of audiences using a range of approaches.

There are four key components of an effective awareness-raising campaign and all should be defined and described in our planning:

1. Message
2. Audience
3. Strategy
4. Timing.

Common approaches and techniques for raising public awareness are presented in Box 10.2.

Box 10.2. Common approaches and techniques for raising public awareness

- Personal communication with community members through public meetings, presentations, workshops and informal social events
- Structured education and training programmes in schools, colleges, universities, adult learning centres and libraries
- Enhanced information literacy skills within libraries, schools and universities
- Static and travelling exhibitions and displays
- Printed materials - for example, brochures, billboards, cartoons, comics, pamphlets, posters, and resource books
- Audio-visual resources - for example, pre-recorded cassettes, videos, CDs and DVDs
- Websites, e-mail discussion lists and Web Logs (blogs)
- Mass media interviews and articles in newspapers, magazines and electronic publications accessible via the Internet
- Mass media interviews and news items on radio and television
- Celebrity spokespeople - for example, Desmond de Silva in support of the Autism Awareness Campaign in Sri Lanka
- Where oral traditions dominate, performances of specially composed stories, songs, dances, plays and poems
- Strategic partnerships and alliances with other organizations - for example, local libraries, schools and civil society
- Public Relations (PR)
- Political advocacy and lobbying

Sayers, 2006

Partnerships amplify mutual interests and success, and present the parties involved with special challenges that must be navigated by agreement or mutual interest and contribute to the SD of the plan area. Partnerships for integrated planning within and across sectors and institutions (horizontally and vertically) and working teams can be extremely useful. Non-profit, religious and political organizations may also be partnered with planners and others to increase the likelihood of each party achieving their mission. However, governmental, (sub)regional and local institutions may partner to achieve their institutional national/regional interests. Different characteristics and combinations of partnerships can match the characteristics and needs of the problem. For successful ICZM and IWRM the partnership with the people/public in the area is crucial. The setting up and smooth functioning of a partnership requires a participating culture. CSOs and NGOs are, to some extent, cells or nuclei to wider partnerships. In the Mediterranean, we have a very large number of CSOs and NGOs at all levels, from local and national to regional/international where big networks, federations and international NGOs exist. Some go beyond environmental protection or sectoral issues and cover SD issues. For further information on awareness-raising, PP, legal provisions and rights to information, methodologies and indicators on PP in the Mediterranean, see Scoullos *et al.*, 2002 and www.mio-ecsde.org/_uploaded_files/article_file_97_TF6MYR3EBY3VN.pdf.

10.4 Monitoring and review

Monitoring is used to follow and oversee progress of both the action plan/road map and of the overall plan itself. This is usually linked to reporting, which advises on positive and negative events, allowing for enhanced or remedial action as appropriate.

Importantly, monitoring should distinguish between:

1. monitoring of the conditions in the plan area itself, including environmental, economic and social factors
2. monitoring the specific outputs of the action plan in terms of their costs, effectiveness and quality and if the actions continue to be viable in terms of the strategic objectives of the plan
3. monitoring the wider outcomes of both actions and the policies of the plan as a vehicle in delivering SD.

Each of the above relates back to the indicators identified earlier in the process when setting the vision, namely the:

1. sustainability indicators: measures to show that the plan purpose is realized (long-term outcomes)
2. impact indicators: measures to show that the plan outputs are achieved (medium-term outputs)
3. performance indicators: measures to show that project activities are undertaken (short-term outputs).

The above are linked to reporting at agreed review milestones. This reporting provides the steering group or committee with a summary of the status of the plan and its actions at regular intervals.

The monitoring process should feed into a review of the integrated plan, typically on a 5-year cycle. As the plan is implemented, necessary changes in its set of indicators can be made. As new needs may emerge and other areas become less important, provisions and flexibility for change should be built in the system.

Lesson: Delivering results – the importance of realizing the vision

The strong emphasis on the delivering of real outcomes of direct benefit to local communities and the environment helps shape the design of the planning process and, in particular, engagement of stakeholders within it. The integrated plan should be politically, technically, financially, and legally implementable, and be socially acceptable. Thus the importance given to establishing the shared vision for the area and the advocating of scenarios as a tool for building "futures" around which the plan measures can be shaped. It is at this stage that the process shifts from analysing, consulting, planning, etc. – to catalysing change – "*making things happen*".

The strength of the integrated plan proposed by the IMF is the use of a combination of instruments from the ICZM, IWRM and coastal and aquifer management, and other methodologies. These include not only policy changes, but also concrete actions to be materialized through a costed investment portfolio based on an implementation road map, awareness-raising and capacity-building, and institutional adjustments.

The IMF plan is therefore seen as transformative - improving governance, structure and cultures, providing on-the-ground concrete actions, and raising the community's understanding and care for the coastal zone.

Experience from the Buna/Bojana plan: the objectives, measures and actions grid

Governance is seen as the foundation of the integrated plan, and to delivering results. It is critical that governance structures, which will not necessarily be the same as the structure responsible for the preparation of the plan, should include all key national and local agencies that can enable or facilitate the delivery of the plan and the implementation of the actions proposed. Appropriate governance will be effective with coordination among competent ministries, regional and local authorities, and with the involvement of stakeholders. Common experience from the disciplines (CZM, IWRM, coastal aquifers and groundwater management) is that appropriate governance works both horizontally (bringing together line ministries or their regional branches, such as the ministry of environment, of water resources and economic ministries) and vertically (starting from securing endorsement of the plan at the highest possible administrative level, e.g. obtaining a presidential degree or a joint ministerial decision and moving to subregional, prefecture and municipality levels, as well as unions of local

authorities, city councils, professional associations, investors, chambers of commerce and industry, NGOs, academia).

The basic philosophy of "wise", integrated management is:

1. the socially just, equitable and economically viable use of environment, natural resources and ecological services, and
2. the maintenance of biodiversity and proper functioning of ecosystems through the best use of man-made, cultural knowledge and human capital.

Both should be delivered within ambitious but realistic operational frameworks. This can only be achieved through good governance.

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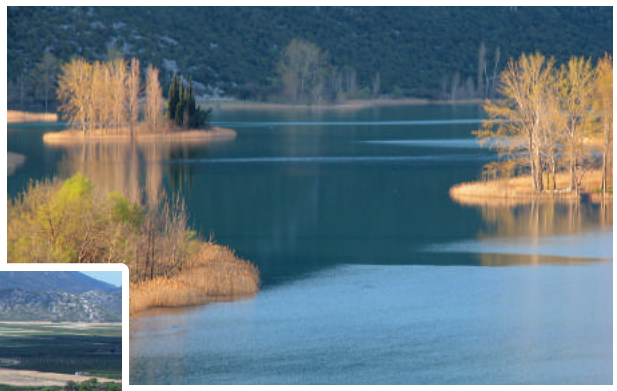

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