Shaping an Holistic Approach to Protect the Adriatic Environment between coast and sea.

The three year Shape project (2011-2014) involved 13 partners from six Adriatic Sea countries and was co-funded by the IPA Adriatic Cross-border Cooperation Programme of the European Union.

It aimed at contributing to the development of a multilevel and cross-sector governance system, based on an holistic approach and integrated management of natural resources, risk prevention and conflicts resolution among users and users of the Adriatic coast and sea.

Project activities promoted the application and the successful implementation of Integrated Coastal Zone Management and Maritime Spatial Planning in the Adriatic region.

The present handbook is intended as a methodological and practical guide aiming to support the future evolution of the MSP approach in the Adriatic Region. In this view it mainly addresses institutional officials, planners and experts on MSP issues, illustrating what they can do to further disseminate and concretely implement MSP in an Adriatic cross-border perspective.

www.shape-ipaproject.eu
METHODODOLOGICAL HANDBOOK ON MARITIME SPATIAL PLANNING IN THE ADRIATIC SEA
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The Adriatic Sea is a semi-enclosed sea with a surface area of about 138,600 km² and a volume of 33,000 km³; its shape can be approximated to a rectangle extending north-northwest, about 800 km long and 200 km wide (Gacic et al., 2001). Adriatic oceanographic properties are influenced by geographic, orographic and bathymetric characteristics of the basin as well as by interactions with the rest of the Mediterranean Sea. To this regard, with total annual average reaching about 5,700 m³/s river inputs play a significant role, in particular in the north-western part of the basin where Po river accounts for about the 28% (1,585 m³/s) of the total annual river contribution and where other relevant rivers flow (e.g. Adige and Brenta). The second most relevant freshwater inflow comes from the Albanian rivers, however having a weak influence on the circulation in the region (Gacic et al., 2001). The Strait of Otranto (72 km wide and 780 m deep) ensures the connection with the rest of the Mediterranean, thus enabling water exchanges and influencing the circulation pattern between the Ionian and the Adriatic Seas.

The Adriatic Sea bathymetry is also characterised by important transversal and longitudinal differences. The North Adriatic sub-basin (extending between Venice-Trieste and Ancona-Zadar lines) rarely exceeds the depth of 100 metres and its north-western part is particularly shallow. The depth firstly increases slowly southward and then sharply reaches about 270 m of the Middle Adriatic Pit (also called Jabuka Pit or Pomo Depression). Further to the south, the seabed rises to the Palagruza Sill (about 170 m) that separates the Middle Adriatic Pit from the much deeper South Adriatic Pit (and the Middle Adriatic sub-basin from the South Adriatic sub-basin). This pit marks the deepest part of the Adriatic Sea with a maximum depth over 1200 m. Further south the seabed rises again to the Otranto Sill (about 780 m).

The Adriatic Sea is bordered by six coastal states; three are EU countries (Italy, Slovenia and Croatia), one is a EU candidate country (Montenegro) and the other two are EU potential candidates (Albania and Bosnia and Herzegovina). The Italian coasts are relatively smooth and regular, in particular in the north-western part of the basin, while the eastern part of the coast (mainly in Croatia) is characterised by an irregular bottom that increases sharply in the offshore direction and a high number of islands and islets (in particular along the Istria and Dalmatia coasts) (Gacic et al., 2001). The eastern side is also characterised by the close proximity of the Dinaric Alps, while in the western side the main orographic reliefs (the Apennine) are more distant from the coast. North-western coastal areas also includes large wetlands (as the Po delta and Venice lagoon) of high ecological relevance.

The Adriatic Sea, one of the most valuable inland seas of the world, is strategic for the wellbeing and prosperity of all the countries facing this basin, as also stressed by the EC Maritime Strategy for the Adriatic and Ionian Seas (EC COM(2012) 713) and the on-going initiative drafting the overarching EU Strategy for the Adriatic and Ionian Region - EUSAIR.

This marine region has a relevant ecologic, economic and social value, as route for maritime transport, food and energy source, site for residence and recreation, destination for coastal and marine tourism, relevant site for nature protection and biodiversity preservation, climate regulator, area for cross-border cooperation, site for innovative ad cross-border research, etc. However its coastal and marine areas are experiencing increasing pressures due to growing human activities; these often come into conflict with each other and with needs of habitats and landscapes protection. Human uses compete each other for vital space and natural resources, threatening some of the most sensitive and precious habitats of the Adriatic Sea. Global challenges as climate change and the related sea level rise could in future strongly affect Adriatic coastal and marine areas, exacerbating current problems with effects often going beyond national or regional boundaries.
The Shape project

The increasing attention on issues related to the maritime and coastal development has led the international communities to create specific approaches for the management and planning of these spaces, as in particular Integrated Coastal Zone Management (ICZM) and Maritime Spatial Planning (MSP), strongly supported by the European Union and Mediterranean transnational organizations such as UNEP-MAP.

Shape “Shaping an holistic Approach to Protect the Adriatic Environment between coast and sea” is a project co-funded by the IPA Adriatic Cross-border Cooperation Programme of the European Union, involving thirteen partners representing the Italian Adriatic regions, countries of the eastern Adriatic border and the UNEP-MAP Priority Actions Programme - Regional Activity Centre (PAP/RAC).

Partners involved in Shape recognise the Adriatic Sea as a single water body. In this perspective, the project aims to develop a multilevel and cross-sector governance system for the Adriatic Sea, based on an holistic approach and aiming to: integrated management of natural coastal and marine resources, risk prevention and conflicts resolution among uses and users. In line with EU horizontal and vertical policies and in the frame of the IPA Adriatic programme’s strategy, the project promotes the strengthening of the institutional capacity needed to face these challenges. The focus is on Integrated Coastal Zone Management and Maritime Spatial Planning: project activities wish to promote the application and successful implementation in the Adriatic Region of the ICZM Protocol in the Mediterranean (UNEP/MAP/PAP, 2008) and the EC proposed Directive Region of the ICZM Protocol in the Mediterranean.

WP1 - Cross-border Project Management and Coordination; focusing on achieving and assuring an efficient and effective transnational project coordination and financial management.

WP2 - Communication and dissemination; addressing the wider public and all interested stakeholders on ICZM and MSP, EU and Adriatic policies, national and local frameworks, and aiming to promote coordination with other similar initiatives within the EU context.

WP3 - Integrated Coastal Zone Management; bringing regional partners together for successful cross-national and cross-sectoral cooperation within the ICZM framework, referring in particular to the UNEP-MAP Protocol on ICZM in the Mediterranean.

WP4 - Shipping towards Maritime Spatial Planning; aiming to support MSP evolution in the Adriatic basin through the creation of an ad hoc methodology for maritime planning and testing of MSP at the regional and local scale by common data processing, mapping and pilot actions.

WP5 - Within land and sea; promoting integration between ICZM and MSP in the Adriatic, in particular through the development of a demonstrative Web-GIS Atlas at the basin scale.

MSP is specifically addressed by WP4, that is articulated in five actions dealing with the following topics: (i) analysis of the legal and policy framework in a multi-scale perspective (from the European to the regional level), (ii) ecosystem assessment based on MSFD requirements as basis for MSP, (iii) analysis of problems and opportunities related to MSP implementation in the Adriatic Sea and mapping of main Adriatic Sea uses, (iv) pilot projects on MSP and its integration with ICZM and MSFD, (v) development of a common methodology for MSP in the Adriatic Sea.
Pilot projects on MSP

Shape developed nine pilot projects approaching MSP issues at the local or regional scale. Some projects directly dealt with the intrinsic holistic and integrated nature of MSP while other focused on specific themes as: data gathering and monitoring to support MSP, bridging the gap between science and decision making, analysis of socio-economic aspects, links between MSP and MSFD or ICZM. The following pilot projects were elaborated:

- Maritime perspectives on sea space, coastal areas and their use. Shaping technical tools to resolve conflicts according to MSP approach (partner: Emilia Romagna Region).
- From scientific knowledge to the sustainable management of the Veneto maritime space (partner: Veneto Region).
- Monitoring of environmental issues in defined areas of the Central-Southern Adriatic basin through the use of the biological early warning system (partner: ARPA Molise).
- Developing ICZM & MSP indicators for a more sustainable management of the coastal and marine area of pilot site (partner: ECAT Tirana).
- Technical basis for municipal spatial structure plan - Strunjan (partner: Regional Development Centre Koper).

- System for monitoring sea water quality using toxicoLOGY data on cetaceans (partner: Abruzzo Region).
- Profitability analysis of a beach: economic analysis applied at a public marine domain (partner: Marche Region).
- Analysis of multiple stressors operating in the MPA of Torre Guaceto and neighbouring coastal area of Brindisi port with inclusion of the industrial area: a DPSIR approach (partner: Puglia Region).

Conclusive findings of the pilot projects were summarised through a 4-pillars matrix highlighting: (i) main outcome and deliverables of the pilot project (What we have done), (ii) improved skills (What we have learned/ skills improved), (iii) possible future uses of the project outcome (How we can use output in the future), (iv) future opportunities and criticalities related to the evolution of pilot project contents in an MSP perspective.

Source: Regional Development Centre Koper
Handbook objective and target

The present handbook is intended as a methodological and practical guide aiming to support the future evolution of the MSP approach in the Adriatic Region. In this view it mainly addresses institutional officials, planners and experts on MSP issues, illustrating what they can do to further disseminate and concretely plan and implement MSP in an Adriatic cross-border perspective.

The following two chapters of the handbook provide summary information on the current policy context of MSP at the European, Mediterranean and Adriatic level and describe what are the perceived benefits and expected challenges of MSP implementation in the Adriatic Sea. Chapters 4 to 6 represent the core of the methodological handbook, i.e.: providing input for the development of a common vision for the future of the Adriatic Sea (chapter 4), identifying the key principles for MSP in the basin (chapter 5), and illustrating a step-by-step approach for its implementation (chapter 6). Finally, chapter 7 stresses the importance of establishing clear links between MSP and MSFD, also to coherently contribute to the goals set by the Integrated Maritime Policy of the European Union (EC COM(2007) 575; EC COM(2009) 466) and the related Blue Growth (EC COM(2012) 494).

The methodological handbook is based on the results of actions 4.1 to 4.4 of Shape WP4; it is therefore based on a joint effort of Shape partners, reflecting a wide range of backgrounds and experiences. Furthermore, it gets inspiration from a number of MSP initiatives and projects, including: BaltSeaPlan, Plan Bothnia, PlanCoast, MASPNOSE, the DG MARE studies on MSP in the Mediterranean and the Adriatic Sea (PRC, 2011a; 2011b) and the UNESCO-IOC guideline on MSP (Ehler in the Mediterranean and the Adriatic Sea (chapter 4), identifying the key principles for MSP in the basin (chapter 5), and illustrating a step-by-step approach for its implementation (chapter 6). Finally, chapter 7 stresses the importance of establishing clear links between MSP and MSFD, also to coherently contribute to the goals set by the Integrated Maritime Policy of the European Union (EC COM(2007) 575; EC COM(2009) 466) and the related Blue Growth (EC COM(2012) 494).

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The sea is a complex system that cuts across administrative borders. It is subject to considerable pressures from human uses, competing each other for vital space and resources and threatening sensitive and precious coastal and marine habitats. To face these conflicts, explore the opportunities of synergies and mitigate the environmental impacts, it is necessary to elaborate and adopt an holistic approach supporting the development of coherent pictures and the creation of spatial plans and examining the issue of the needed integration among different policy and planning tools. The challenge is to plan and regulate marine and maritime activities, overcoming the sectoral approach and integrating horizontally and vertically different competences do not expertise. In this perspective, cross-border issues are often to be taken into account. The need for a more holistic approach to the sea was recognized by the EU and an overarching framework, the Integrated Maritime Policy (IMP), was developed in order to integrate sectorial issues with an ecosystem based management view. IMP was launched by the EU through the Blue Paper on 10 October 2007 (EC COM(2007) 575); it applies to the oceans and seas an holistic, integrated approach and promises to replace fragmented resource management approach with an ecosystem based management view. The IMP Blue Paper announced some strategic initiatives subsequently developed by the EU (see EC COM(2012) 491), including among the others: a European maritime transport space without barriers (EC COM(2009) 10), a European strategy for marine and maritime research (EC COM(2008) 534), a European strategy on Marine Knowledge (EC COM(2012) 473), support to national integrated maritime policies to be developed by Member States (see EC COM(2009) 540), European network for maritime surveillance (EC COM(2009) 538 and EC COM(2010) 584), roadmap towards Maritime Spatial Planning (EC COM(2008) 791 and EC COM(2010) 771), strategy on climate change adaptation of marine and coastal issues (EC SWD (2013) 133), etc. The Blue Growth (EC COM(2012) 494) is the IMP’s contribution to the goals of Europe 2020 strategy for smart, sustainable and inclusive growth (EC COM(2010) 2020). It is the EU long-term strategy to support sustainable growth in the marine and maritime sectors, recognising the great potential of seas and oceans for innovation, in particular in the following key areas: blue energy, aquaculture, maritime and coastal tourism (including cruising), marine mineral resources and blue biotechnology.

On June 2008 the European Commission adopted the Marine Strategy Framework Directive (MSFD; Directive 2008/56/EC) to promote the sustainable development of the seas and the protection of the marine ecosystems. MSFD is the environmental pillar of IMP and its objective is the achievement of Good Environmental Status (GES) of the EU’s marine waters by 2020 and the protection of the resource base upon which marine-related economic and social activities depend. From a normative perspective it provides a solid legal basis for the application of an ecosystems based approach to the management of human activities affecting the marine environment and ecological systems, all with a view to ensuring that they are not irreversibly damaged by the cumulative effects of natural and anthropogenic pressures (Long, 2011). MSFD expressly recognizes the importance of managing the sea on a regional basis, and highlights the role of cooperation across bordering countries. Marine regions and sub-regions are defined taking into account hydrological, oceanographic and biogeographic features.

Policy context
Comparison of GES descriptors according to MSFD and Ecological Objectives defined by UNEP/MAP

<table>
<thead>
<tr>
<th>Qualitative descriptors for determining GES - 2008/56/CE Annex I</th>
<th>EOs identified by EcAp CG and COR-GEST of UNEP/MAP</th>
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<tr>
<td><strong>D1</strong> Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climatic conditions</td>
<td><strong>EO1</strong> Biodiversity is maintained, including both species and habitats</td>
</tr>
<tr>
<td><strong>D2</strong> Non-indigenous species introduced by human activities are at levels that do not adversely alter ecosystems</td>
<td><strong>EO2</strong> Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems</td>
</tr>
<tr>
<td><strong>D3</strong> All element of the marine food-webs, to the extent that they are known, occur at normal abundance and diversity and levels capable of ensuring long-term abundance of the species and the retention of their full reproductive capacity</td>
<td><strong>EO3</strong> Population of all exploited fish and shellfish are within safe biological limits, exhibiting a population age and size distribution that is indicative of a healthy stock</td>
</tr>
<tr>
<td><strong>D4</strong> Human-induced eutrophication is minimized, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters</td>
<td><strong>EO4</strong> Alterations to components of marine food webs cause by resource extraction or human-induced environmental changes do not have long-term adverse affects on food-web dynamics and related viability</td>
</tr>
<tr>
<td><strong>D5</strong> Sea-floor integrity is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected</td>
<td><strong>EO5</strong> Human-induced eutrophication is prevented, especially adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters</td>
</tr>
<tr>
<td><strong>D6</strong> Permanently altered hydrographic conditions does not adversely affect marine ecosystems</td>
<td><strong>EO6</strong> Sea-floor integrity is maintained, especially in priority benthic habitats</td>
</tr>
<tr>
<td><strong>D7</strong> Concentrations of contaminants are at levels not giving rise to pollution effects</td>
<td><strong>EO7</strong> Alteration of hydrographic conditions does not affect coastal and marine ecosystems</td>
</tr>
<tr>
<td><strong>D8</strong> Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards</td>
<td><strong>EO8</strong> The natural dynamics of coastal areas are maintained and coastal ecosystems and landscapes are preserved</td>
</tr>
<tr>
<td><strong>D9</strong> Properties and quantities of marine litter do not cause harm to the coastal and marine environment</td>
<td><strong>EO9</strong> Contaminants cause no significant impact on coastal and marine ecosystems and human health</td>
</tr>
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Integrated Coastal Zone Management and Maritime Spatial Planning are identified by IMP as fundamental tools/processes for integrated policy-making. The EU Recommendation of 30 May 2002 on ICZM (Recommendation 2002/413/EC) encourages a strategic approach to assure the sustainable development of coastal areas. Following the EU Recommendation, Member States began to use ICZM to regulate the spatial deployment of economic activities and to set up spatial planning systems for Europe’s coastal areas. Nevertheless, there is still a lack of experience, instruments, tools and capacities available to the policy makers and practitioners to fully and successfully implement this recommendation. In January 2008, 14 Mediterranean Countries signed the Protocol on Integrated Coastal Zone Management in the Mediterranean (UNEP/MAP/PAP, 2008), in the framework of the Barcelona Convention, marking a milestone in the implementation process of ICZM. To date, eight countries and the EU have ratified the Protocol; consequently, on 24th of March 2011, the Protocol entered into force, becoming binding for all the contracting parties. In implementing the Protocol, the Parties shall be guided by general principles of integrated coastal zone management, which lay on the application of an ecosystem approach, of a broad overall perspective (thematic and geographic) which takes into account local specificity, on the enhancement of vertical and horizontal coordination among institutions, on the promotion of public participation in a transparent decision making process. The IMP calls for Maritime Spatial Planning. The main objective of MSP is to allocate marine space in a rational manner and thus to arbitrate between different sectoral or user’s interests. MSP extends beyond managing and protecting the marine environment; it seeks to integrate all relevant maritime sectors - no sector is given priority over the other. MSP seeks to reconcile competing claims on the use of the marine space and in doing so make use of plans and maps as well as of zoning of different areas for different purposes. To be effective, MSP must operate in three dimensions by simultaneously...
addressing activities that take place on the seabed, the water column, and the surface. Moreover, MSP must take account of both fixed structures (e.g. offshore windfarms or aquaculture) and temporary activities (e.g. navigation and fishing). The time dimension is therefore of high importance in MSP which makes it in fact a four-dimensional process. The compatibility of uses and the resulting management needs of a particular maritime region might significantly vary over time. This variation has to be taken into account when management decisions are made. With the EC COM(2008) 791 the Commission aimed “to facilitate the development of Maritime Spatial Planning (MSP) by Member States and encourage its implementation at national and EU level”. It sets out 10 key principles for MSP and seeks to encourage the development of a common approach among Member States.

Achieving consistency between land use and maritime planning systems is a challenge. Coastal zones are the “hinge” between maritime and terrestrial development. Drainage areas or land-based impacts from activities such as agriculture and urban growth are relevant in the context of MSP. This is why land spatial planning should be coordinated with MSP. Recognising the complementarity and the need to achieve coherence between the ICZM and MSP policies, in March 2013 the European Commission adopted a proposal for a Directive establishing a framework for Maritime Spatial Planning and Integrated Coastal Management (EC COM(2013) 133).

 Examples of MSP and MSP related EU policies
MSP in the Adriatic

Maritime Spatial Planning, compared to land use planning, is a fairly new and emerging process in the Adriatic Sea. The process is at its embryonic stage and is influenced by differences among countries and Adriatic areas, related to the different needs within the basin and to the longer or shorter membership to the European Union. The single countries and regions (sub-national level) analysed within the Shape project had not developed until May 2013 an Integrated Maritime Policy; the management of maritime space and resources is highly fragmented and MSP had not been implemented, yet. Vertical and horizontal coordination seems to be particularly complex, in many cases multiple and sector ministries and/or regional departments are responsible for IMP/MSP related topics.

Several sector laws, plans and operative instruments related to the management of the marine space and maritime activities are well developed in all the countries of the basin, with differences also depending on the EU membership; these all together represent a good and well developed starting point for the future development of MSP in the macro-region. Moreover, MSP seeds have been planted and are starting to sprout in the Adriatic, including for example: the Croatian Coastal and Marine Strategy to be developed in the next future, the Italian Ritmare Flagship project on marine research including a sub-project on MSP, the Slovenia Resolution on the National Maritime Development Programme (OG RS, No. 87/2010) taking into account IMP principles and goals, the Strategic Plan for Marine and Coastal Protected Areas under development in Albania, the Spatial Plan for the Coastal Zone of Montenegro including territorial waters and the connected CAMP project.

At the Adriatic basin level, actions and resources are needed to further improve cooperation and coordination among countries and regions on MSP themes, including in particular: enhanced stakeholder involvement, more effective knowledge sharing, data acquisition on offshore areas (in particular the “open sea”), improved coherence between MSP and terrestrial spatial planning (PRC, 2011b). Existing cross-border initiatives can directly or indirectly facilitate the dissemination of MSP concepts, providing a fertile substrate for improved Adriatic cooperation on these issues, as in the case of: the Joint Commission for the protection of the Adriatic Sea and coastal area from pollution, the Adriatic - Ionian Initiative, the same Shape project, and the recently started DG MARE ADRIPLAN project focusing on MSP in the Adriatic and Ionian Region.

A big boost to coordinated actions, also on MSP and ICZM issues, will derive from the adoption and implementation of the EU Strategy for the Adriatic and Ionian Region - EUSAIR and the related Action Plan under development. A macro-regional strategy is an integrated framework to address common issues of countries located in the same geographic area, which thereby benefits from strengthened cooperation. This includes challenges and opportunities that can be more efficiently and effectively tackled in a regional cooperation perspective. EUSAIR covers eight countries: four EU Member States (Croatia, Greece, Italy and Slovenia) and four non-EU countries (Albania, Bosnia and Herzegovina, Montenegro and Serbia). The new strategy will build on the experience gained in existing macro-regional strategies (Baltic Sea and Danube) and will integrate the Maritime Strategy for the Adriatic and Ionian Seas, adopted by the Commission on 30 November 2012 (EC COM(2012) 713). The main objective of EUSAIR is to promote economic and social prosperity and growth in the region by improving its attractiveness, competitiveness and connectivity, while at the same time preserving the environment and ensuring healthy and balanced marine and coastal ecosystems. The Strategy is also expected to play an important role in promoting the EU integration of the candidate and potential candidate countries in the region. Following the results of an extensive consultation, the Strategy will be developed in the form of a draft Communication accompanied by an Action Plan, with a view to adoption by the European Commission during the first semester of 2014. The Communication and the Action Plan will be submitted to the Council of the European Union for endorsement in the second half of the year.

Lavsa-Kornati (Croatia) - photo by PAP/PAC
The new Croatian Coastal and Marine Strategy

Convinced that only an integrative and strategic approach providing for the adoption and implementation of sustainable measures based on an ecosystem approach can reduce negative impacts of the increasing human pressure on coastal and marine zones as well as prevent natural threats from them, the Croatian Parliament ratified the ICZM Protocol on 12 October 2012. Moreover, as a new EU member state, Croatia has started a process of transition from the EU legal acquis, namely by adopting relevant approaches and policies, some of which deal with coastal and marine environment protection and management. More precisely, in 2011 Croatian government adopted a Regulation establishing a framework for action in the field of marine environment protection (OG 136/11), which sets the basis for the development, implementation and monitoring of national marine strategy. The requirements of the EU MSFD is also important to note that Croatia has adopted WFD in 2008, and that it has drafted Water Management Plan 2012-2015, all according with the requirements of the EU Water Framework Directive.

Having in mind the variety of policies dealing with the management of coastal and marine environments, as well as the definition of the coastal area according to the ICZM Protocol (e.g., its land and sea components), the Croatian Ministry of Environment and Nature Protection decided to link the obligations arising from the ICZM Protocol and MSP in a way to prepare a unique national strategic document for the Croatian Adriatic Region that would integrate both - the coastal and the marine parts. Therefore, it is expected that improved coordination and coherence of actors for sustainable coastal and marine areas management would be achieved, respecting and applying the ecosystem-based management of human activities and securing the sustainable use of goods and services. The proposed new national strategy will hence introduce consideration of the cooperation is clear, in particular in relation to four pillars:

- Pillar 1 “Driving innovative maritime and marine growth”, aiming to promote sustainable economic growth, job and income opportunities in the region from blue economy sectors. Main sectors identified at the moment include: fishery, aquaculture, seafood processing, blue biotechnology, marine equipment, shipping, boating and other maritime services.
- Pillar 2 “Connecting the region”, aiming to improve transport and energy connections within the Adriatic and Ionian-Bay Region. Better connections are a compelling need for the regional economy’s development and social development. This pillar focuses on three strategic topics: i) transport infrastructures, ii) integrated maritime space, iii) energy resources and energy efficiency.
- Pillar 3 “Preserving, protecting and improving the quality of the environment”, focusing on environmental issues where macro-regional cooperation can have a positive adds-value compared with national actions taken by countries, i.e.: (i) protection of the marine environment, including preservation of marine biodiversity and habitats and improvement of environmental quality; (ii) sound management of transboundary habitats and biodiversity. Climate change adaptation, ICZM and MSP are horizontal activities of pillar 3, with strong connections with all other EUSAIR pillars.
- Pillar 4 “Increasing regional attractiveness”, aiming to increase tourism attractiveness of the region by supporting sustainable coastal and maritime tourism and diversified, improving the quality of tourist services, preserving and promoting cultural heritage, promoting common marine and cultural traditions.

Moreover, “Research, innovation and SME” and “Capacity building” have been identified as two cross-cutting activities involving every pillar.

Why do we need MSP at the Adriatic level?

In the Adriatic Sea, the need for MSP is particular high, considering the intense use of this marine area and the potential growing conflicts among increasing users’ needs and ecosystem protection objectives that also have great relevance at the basin scale. At the same time, the Adriatic Sea has great potential for MSP implementation (PRC, 2011a; 2011b) considering: (i) the availability of a good level of marine knowledge, although mainly concentrated on marine areas close to the coast, (ii) the good attitude in sharing data, (iii) the cooperative tradition and the on-going cross-border initiatives, (iv) the good development of sectoral laws, plans and tools related to the management of the marine space and maritime activities, (v) the sprouting of first MSP initiatives.

Efficient model for financing coastal and marine activities in Montenegro

Montenegro is one of the five Western Balkan countries that have developed a regional institution focusing on coastal zone management. According to the 1992 Coastal Zone Law, the Public Enterprise for Coastal Zone Management was established to manage the use of and protect the coastal area, including the coastal land strip, territorial waters of Montenegro and living and non-living resources within. The law also entitles the Public Enterprise to rent the owned coastal areas for the seasonal (temporary) activities in accordance with plans and programmes adopted by the Ministry for Sustainable Development and Tourism. Over the years the generated annual budget constantly increased to about 6 million euros in 2013. According to the law, all income generated from the use of the coastal zone must be reinvested in the protection, improvement and maintenance of the Montenegrin coast. 95% of the generated income is re-directed to coastal municipalities. Every year, Public Enterprise for Coastal Zone Management in accordance with the Annual Investment Plan adopted by the Montenegro Government, reinvests its budget in building of coastal and maritime infrastructure (such as ports, docks, sea-walks, coastal promenades, parks and other open areas on the coast, etc.), organisation of beaches, maintenance of the public areas, management and improvement of coastal protected areas, environmental monitoring programs and environmental projects. The New Coastal Zone Law expected to be adopted during 2014 proposes the transformation of the Public Enterprise into the Coastal Zone Management Agency which will include new responsibilities on the coast and the territorial sea. This will represent a strong basis for better and more efficient management of coastal and maritime activities in Montenegro.

Source: Public Enterprise for Coastal Zone Management

The Shape project underlines the relevance of all the 10 key principles identified by the “Roadmap for Maritime Spatial Planning” (EC COM(2008) 791) for a successful implementation of MSP in the Adriatic Sea. In the analysis performed, all principles got a high average score (greater than 3.5 according to a 0-5 score scale; first 7 principles got average score greater than 4); score variability is rather limited varying between 3.6 and 4.4. This implies that all principles are considered more or less equally relevant. The highest ranked principle confirms the importance to pursue a coordinated and integrated application of ICZM and MSP in the Adriatic Sea, probably due to the nature of this basin being a semi-closed sea where coastal (natural and anthropic) processes and pressures exercise great influence on marine dynamics and maritime uses. Stakeholder consultation and cross-border cooperation are also ranked among the most relevant principles for a successful MSP implementation, stressing again the relevance of added-values provided by collaborative efforts and shared objectives and actions.
Expected benefits

MSP can have significant economic, social, environmental and governance benefits. Based on the results of previous projects and available literature (see in particular Schultz-Zehden et al., 2008; Ehler and Douvere, 2009; Gie et al., 2011; EC DG MARE website), main general benefits of MSP can be summarised as follows:

- increase vertical and horizontal coordination within countries, supporting the adoption of integrative approaches going beyond sector divisions;
- develop cross-border cooperation on marine and maritime issues among EU and non-EU countries, including the adoption of holistic approaches at the marine region and sub-region scale (considering the analysis of “open sea” problems and specificities);
- improve shared information and data management, in particular through Marine Atlas;
- ensure stakeholder involvement, implying greater transparency in all MSP phases and better visibility of step-by-step results;
- enable the adoption of a multiscale approach, implying MSP implementation at various levels, with the possibility to develop coherent nested processes;
- adopt proactive/adaptive rather than reactive management, including long-term vision, scenarios building and proper assessment of future uncertainties;
- reduce conflicts and develop coordination and synergies among maritime and marine activities, including facilitation of co-use;
- encourage investment and innovation, by defining and implementing a transparent and proactive process based on clear rules and roles and able to increase security for investors;
- increase protection of the marine environment and biodiversity, through early identification of pressures, reduction of conflicts between maritime uses and marine protection, reduction of cumulative impacts, and development of opportunities for the sustainable use of marine resources;
- facilitate equitable access to marine resources to all involved countries and regions, including preservation of such resources for future generations;
- improve protection of cultural heritage and preservation of intangible values of the sea (including for example the sea as an open space).

According to Shape project greater benefits of MSP implementation in the Adriatic Sea are specifically related to:

- environmental protection;
- sustainable use of marine resources;
- improved stakeholder involvement;
- improved marine safety;
- maintenance and restoration of ecosystem services.

Benefits ranked as most relevant ones confirm the multi-objective nature of the MSP process, including not only environmental protection, but also other relevant aspects, some of which are at the basis of Blue Growth (EC COM(2012) 494), as in particular the sustainable use of marine resources, also depending on the preservation and improvement of ecosystem services.

Success factors and challenges

Shape developed nine pilot projects approaching MSP issues at the local or regional scale. Together with dedicated meetings and results of Shape WP4 actions, these projects enabled to identify existing and future success factors (i.e. opportunities) and challenges for future actions (i.e. criticalities) related to the implementation of MSP aspects in the Adriatic Sea.

<table>
<thead>
<tr>
<th>Success factors</th>
<th>Challenges</th>
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<tbody>
<tr>
<td>EUSAIR - EU Strategy for the Adriatic and Ionian Region and the related Action Plan.</td>
<td>Long-term and clear commitment (together with vision and goals) of all Adriatic countries and regions to implement MSP, within EUSAIR and based on a specific agreements.</td>
</tr>
<tr>
<td>Inspiration provided by other cross-border initiatives, including: BaltSeaPlan, Plan Bothnia, MASPNOSE, TPEA. Instruments for pre-accession assistance.</td>
<td>Availability of adequate financial and technical resources supporting MSP implementation at the macro-regional level.</td>
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<tr>
<td>EC proposal for a Directive establishing a framework for MSP and ICZM. Links with the protocol on ICZM in the Mediterranean.</td>
<td>Improved implementation - through cooperation - of UNCLOS in the Adriatic, to solve existing undefined situation and provide the legal framework for MSP.</td>
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<tr>
<td>Culture of cooperation and on-going cross-border initiatives and project, that can facilitate the dissemination of MSP concepts.</td>
<td>Integration of terrestrial and maritime planning, towards a coherent ICZM-MSP approach.</td>
</tr>
<tr>
<td>Shape project partnership (involving all Adriatic countries) and results. DG MARE ADRIPLAN project focusing on MSP in the Adriatic and Ionian Region.</td>
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<tr>
<td>Availability of a good level of marine knowledge on areas near the coast.</td>
<td>Increased cross-border cooperation on MSP, also to ensure the sustainable management of the “open sea” space.</td>
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<tr>
<td>The Italian Ritmare Flagship project on marine research including a sub-project on MSP. Good attitude in data and information sharing (e.g. “Adriatic Atlas to support ICZM and MSP” developed by Shape).</td>
<td>Increased stakeholder involvement through an open, transparent and inclusive process, thus ensuring the participation of all actors and Adriatic countries and regions.</td>
</tr>
<tr>
<td>Improved implementation - through cooperation - of UNCLOS in the Adriatic, to solve existing undefined situation and provide the legal framework for MSP.</td>
<td>Effective links between national MSP initiatives and the MSP process at the Adriatic scale.</td>
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<tr>
<td>Data acquisition on off-shore areas to cover existing gaps.</td>
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<tr>
<td>Commitment to further develop/improve and maintain alive existing data sharing platforms and initiatives.</td>
<td>Improved standardisation in data sharing and free access to data needed for MSP.</td>
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<tr>
<td>Improved standardisation in data sharing and free access to data needed for MSP.</td>
<td>Elaboration of data according to real policy and decision making needs.</td>
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<tr>
<td>Good development of sectoral laws, plans and tools related to the management of the marine space and maritime activities.</td>
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<tr>
<td>Application of MSFD, in particular if connections with MSP will be explored.</td>
<td>Horizontal and vertical coordination among sectors and administrations acting at different levels (from local to national); i.e. going beyond fragmentation and sector approaches.</td>
</tr>
<tr>
<td>Capitalisation of synergies between MSP and other EU marine-related policies and directives (e.g. MSFD, WFD, Natura 2000, Blue Growth, CC adaptation, etc.).</td>
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</table>
A common vision for the future of the Adriatic Sea

The sea is a dynamic environment, where changes occur in 4-dimensions. The importance of spatial and temporal variations is well reflected in the MSP definition, i.e. “a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process” (Ehler and Douvene, 2009). To properly take in consideration the temporal dimension, MSP must extend beyond current circumstances and short-term objectives, adopting a long-term approach. Common goals, values and priorities need to be therefore identified and structured in a shared vision of the future of the Adriatic Sea. This vision can be simply defined as the description of what is desired for the considered area and represents the guiding light of the entire MSP process. Given the small size of the Adriatic Sea, and the crowded and growing number of interests, it is essential in orienting the process towards the final goal of achieving a balanced and sustainable use of the marine space and resources.

Elements for a common and shared vision

The definition of a common vision for the future of the Adriatic Sea is an essential step of the implementation of the MSP process. As highlighted in the BaltSeaPlan Vision 2030 (Gee et al., 2011), a common and shared vision can:
• make clear why forward-looking thinking (and long-term perspective) is essential;
• provide an holistic cross-sectoral view on issues that are often regarded separately;
• help to communicate benefits of the MSP process;
• facilitate the stakeholder dialogue;
• help to achieve transnationality in MSP and cooperation among Adriatic countries on marine and maritime issues.

Given its central and guiding role in the whole MSP process, the elaboration of a common and shared vision at the Adriatic scale needs a full stakeholder involvement and enough time for drafting, discussion and finalisation. As argued in the following chapter, it is therefore a key step of the initial phase of MSP. Initial input for the shared vision can be derived from existing policy documents; in the case of the future evolution of the Adriatic Sea the following documents and initiatives can be in particular considered:
• the EC communication “Blue Growth, opportunities for marine and maritime sustainable growth” (EC COM(2012) 494);
• the Bologna Charter 2012; the European Regions Charter for the promotion of a common framework for strategic actions aimed at the protection and sustainable development of the Mediterranean coastal areas;
• the EC Maritime Strategy for the Adriatic and Ionian Seas (EC COM(2012) 713);
• the on-going initiative elaborating the EU Strategy for the Adriatic and Ionian Region - EUSAIR.

The initial input to a common vision for the future of the Adriatic Sea that are illustrated further below in this chapter were discussed and agreed with Shape partners, in particular during the Lignano (Italy) Shape meeting held in October 2013. These are intended to stimulate the future discussion.

Considering above documents, and the overarching Europe 2020 strategy (EC COM(2010) 2020), the timeframe for the following initial inputs to the vision of the future evolution of the Adriatic Sea can be identified in the year 2020. The common vision needs to be based on the integration of the four pillars or four dimensions of sustainability: environment, economy, society and governance; climate change adaptation and improved research are configured as cross-cutting elements of the whole vision.
Maritime services

Off-shore LNG terminal

Off-shore oil and gas extraction

Maritime transport

Maritime works

Yachting and recreational boating

Blue biotechnology

Marine services

Seafood processing

Yachting and recreational boating

Marine research

Environmental monitoring

Marine activities

Cruising

Aquaculture

Coastal protection

Bathing tourism

Snorkeling

Diving

Biodiversity and habitat protection

Renewable energy

Fishing

Military operation

Seafood processing

Marine transport

Blue biotechnology

Yachting and recreational boating

Marine research

Environmental monitoring

Marine activities

Cruising

Aquaculture

Coastal protection

Bathing tourism

Snorkeling

Diving

Biodiversity and habitat protection

Renewable energy

Fishing

Military operation
Environmental vision

According to the environmental vision, the Adriatic Sea is a healthy and resilient marine ecosystem satisfying requirements set by the MSFD, the INEP-MAP Barcelona Convention and its protocols, as well as the objectives of the Joint Commission for the Protection of the Adriatic Sea and its Coastal Areas. The environmental vision also foresees an adequate protection of the Adriatic marine and coastal areas with high natural and ecological value and the preservation of Adriatic biodiversity.

This is in particular reached through the improvement of the ecological network of marine protected areas, according to Natura 2000 and Barcelona Convention objectives. A healthy and resilient marine environment can provide ecosystem services for the human well-being, thus supporting the sustainable economic development based on the Green and Blue economy.

The implementation of the environmental vision goals requires a joint effort towards an integrated environmental monitoring system at the Adriatic Sea scale, taking into account also marine areas that do not fall under national jurisdiction.

Economic vision

The potential of the Adriatic maritime and coastal areas for jobs and sustainable economic growth are identified, explored and capitalized. The Adriatic Sea generates high quality employment, in particular based on innovative Green and Blue forms of economy. The role of ecosystem services in supporting economic development is properly recognized and economically valorised. The economic development occurs without compromising the environmental quality of the Adriatic ecosystem and habitats and respecting the principle of equity across the basin. The following marine and maritime sectors are considered highly relevant for the future Blue Growth of the Adriatic Sea: shipping (including commercial, industrial and passenger maritime transport), port activities, coastal and marine tourism (including cruising and boating), aquaculture and fishery. Other significant sectors related to the previous ones are: seafood processing, marine equipment and maritime services (e.g. to shipping and boating). Innovative Blue economic sectors are investigated and assessed in terms of feasibility and sustainability and possibly developed; trade and logistics; tourism; leisure; biotechnology i.e. the production of metabolites and primary compounds from marine bioresources as inputs for food, feed and chemical industries.

Social vision

The Adriatic Sea is an attractive and safe place to live and work; education and job opportunities are granted to all Adriatic people. The Adriatic culture and traditions are acknowledged and strengthened, and represent one of the bases for innovation and economic development. Improved connection reinforces the culture of cooperation across the basin. Stronger cooperation is implemented for actions aimed at the protection and the sustainable development of the Adriatic Sea: shipping (including commercial, industrial and passenger maritime transport), port activities, coastal and marine tourism (including cruising and boating), aquaculture and fishery. Other significant sectors related to the previous ones are: seafood processing, marine equipment and maritime services (e.g. to shipping and boating). Innovative Blue economic sectors are investigated and assessed in terms of feasibility and sustainability and possibly developed; trade and logistics; tourism; leisure; biotechnology i.e. the production of metabolites and primary compounds from marine bioresources as inputs for food, feed and chemical industries.

Government vision

The management of the Adriatic Sea is based on an integrated, ecosystem-based and adaptive approach. The environmental vision also foresees an adequate protection of the Adriatic ecosystem and habitats and respecting the principle of equity across the basin. The following marine and maritime sectors are considered highly relevant for the future Blue Growth of the Adriatic Sea: shipping (including commercial, industrial and passenger maritime transport), port activities, coastal and marine tourism (including cruising and boating), aquaculture and fishery. Other significant sectors related to the previous ones are: seafood processing, marine equipment and maritime services (e.g. to shipping and boating). Innovative Blue economic sectors are investigated and assessed in terms of feasibility and sustainability and possibly developed; trade and logistics; tourism; leisure; biotechnology i.e. the production of metabolites and primary compounds from marine bioresources as inputs for food, feed and chemical industries.

Cross-cutting elements of the vision

Climate change adaptation in the coastal and marine sectors is strongly reinforced, requiring and generating actions (mainstreaming) in the environmental, economic, social and governance sectors. This implies that the Adriatic basin is more prepared to cope with climate change impacts and related risks for people and socio-economic activities. Special attention is given to climate change adaption in the marine and fisheries sectors, given the fact that at the moment this is poorly investigated. Adriatic countries cooperate on climate change mitigation as well, committing to reduce the emission of greenhouse gases derived from marine-based human activities. Improved research represents another key cross-cutting element of the Adriatic vision. The cooperative attitude can facilitate the creation of marine clusters and research networks that aim to spur innovation. Research and innovation support the Blue Growth based on sustainability principles and the preservation of Adriatic habitats and biodiversity.
Approaches and principles for MSP in the Adriatic Sea

Marine processes that are essential in providing ecosystem services for human uses of the sea and its resources go beyond the limits defined by arbitrary boundaries and sector approaches. Maritime Spatial Planning at the scale of the Adriatic Sea must deal therefore with the ecosystem as a whole, and at the same time must be able to address the intrinsic dynamic and evolving nature of the sea. These issues immediately call for the adoption of two key approaches in the implementation of MSP, i.e.: ecosystem-based and adaptive management approaches.

Ecosystem-based approach and adaptive management

According to Ehler and Douvere (2009) the ecosystem-based approach or the ecosystem approach (EcoAp) can be defined as "an integrated approach to management that considers the entire ecosystem, including humans. The goal of ecosystem-based management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the goods and services humans want and need. Ecosystem-based management differs from approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors". The adoption of this approach:

- "emphasizes the protection of ecosystem structure, functioning, and key processes;"
- explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;
- acknowledges interconnectedness among systems, such as among air, land and sea;
- integrates ecological, social, economic, and institutional perspectives, recognizing their strong interdependencies; and
- is place-based in focusing on a specific ecosystem and the range of human activities affecting it" (Ehler and Douvere, 2009).

MSFD acknowledges the relevance of the ecosystem approach, requiring its application (art 1.3) in the elaboration of marine strategies. This approach is in particular required to ensure that the collective pressures of human activities "is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations".

The connection of EcoAp with MSP is rather evident; optimising the use of the maritime space and marine resources MSP aims to reduce conflicts and increase synergies among human uses, including the reduction of pressure on and the preservation of marine ecosystems and biodiversity. Indeed, the application of EcoAp within MSP (and ICZM) is required by the same framework directive proposed by EC COM(2013) 133.

As stressed by the EcoAp principle (5) defined by the Convention for Biological Diversity (CBD COP-5 Decision 6), EcoAp priority target is the conservation of ecosystem structure and functioning that is essential in maintaining ecosystem services and that, in turn, is the basic foundation of maritime human uses to be managed through MSP. Links between MSP and EcoAp can be found in other principles as well. For example both stresses the relevance of involving stakeholders in the planning and managing process (EcoAp principle 12 and MSP principle 4) or of basing the analysis on a strong and wide data and knowledge base (EcoAp principle 10 and MSP principle 10). According to EcoAp ecosystems must be managed within the limits of their functioning (principle 6) implying that planning and management must go beyond administrative limits. At the regional or macro-regional scale this requires cooperation across borders (MSP principle 7) to ensure coherence of plans across ecosystems; links with the MSP principle 9 "achieving coherence between terrestrial and maritime spatial planning" is also evident.
The objective of management of land, water and living resources are a matter of societal choice.

Management should be decentralised to the lowest appropriate level.

Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.

Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context.

Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the EcAp.

Ecosystems must be managed within the limits of their functioning.

The EcAp should be undertaken at the appropriate spatial and temporal scales.

Recognising the varying temporal scales and lag-effects that characterise ecosystem processes, objectives for ecosystem management should be set for long term.

Management must recognise that change is inevitable.

The EcAp should seek the appropriate balance and integration of, conservation and use of biological diversity.

The EcAp should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.

The EcAp should involve all relevant sectors of society and scientific disciplines.

Using MSP according to areas and type of activity.

Defining objectives to guide MSP.

Developing MSP in a transparent manner.

Stakeholder participation.

Coordination with Member States - simplifying decisione process.

Ensuring the legal effect of national MSP.

Cross-border cooperation and consultation.

Incorporating monitoring and evaluation in the planning process.

Achieving coherence between terrestrial planning and MSP - relation with ICZM.

A strong data and knowledge base.

1. The objective of management of land, water and living resources are a matter of societal choice.
2. Management should be decentralised to the lowest appropriate level.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.
4. Recognising potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context.
5. Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the EcAp.
6. Ecosystems must be managed within the limits of their functioning.
7. The EcAp should be undertaken at the appropriate spatial and temporal scales.
8. Recognising the varying temporal scales and lag-effects that characterise ecosystem processes, objectives for ecosystem management should be set for long term.
9. Management must recognise that change is inevitable.
10. The EcAp should seek the appropriate balance and integration of, conservation and use of biological diversity.
11. The EcAp should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.
12. The EcAp should involve all relevant sectors of society and scientific disciplines.

Links between EcAp and MSP principles
Both EcAp (principle 9) and MSP (principle 8) recognise that natural ecosystems and socio-economic systems are exposed to constant and inevitable changes; this appears particular true in the case of the dynamic marine space. Monitoring, evaluation and adjustment are therefore key steps of the process, in line with the adaptive management approach.

Adaptive management can be defined as an iterative and systematic process for continually improving management policies and practices by learning from the outcome of operational programs. Through this process, policies are elaborated and practices (including actions of plans) are identified on the basis of the assessment and periodically monitored and evaluated. This iterative process enables to adapt over time the identified actions, in particular considering new and emerging knowledge, the evolution of the considered spatial context and the results of already implemented actions. For its intrinsic adapting nature, this approach is particularly useful and suitable in dealing with complex and highly uncertain issues, such as planning of current and future uses of the sea. Its most effective form - “active” adaptive management - employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed; in the case of MSP this can for example be done through the formulation and analysis of alternative scenarios.

Key principles for MSP

From the EcAp and the adaptive management approaches and the distinguishing features of MSP a number of key principles for the planning of maritime uses at the scale of the Adriatic Sea can be highlighted and needs to be considered in the process implementation.

Pan-Adriatic view

Marine and coastal planners must consider and approach the Adriatic Sea as a whole in all the stages of the MSP process. This requires the adoption of an holistic perspective, according to which the complexity of the Adriatic system is greater than the sum of its component parts; this complexity cannot be understood by the isolated analysis of the single parts. Objectives and targets have therefore to be set for the whole Adriatic, putting the common and shared vision into practice.

Multi-scale approach

At the same time MSP must be able to acknowledge specificities of the different Adriatic regions, such as:

- northern, central and southern basins;
- western and eastern Adriatic;
- from coastal waters to open sea.

This implies taking advantages of spatial differences, i.e. defining different priorities for different places and areas, however within the overall objectives and targets responding to the Pan-Adriatic view. A multi-scale approach is therefore needed; the regional to local scale zooming in can allow to properly consider spatial differences and to detail the analysis and the identification of MSP responses in most critical Adriatic areas, where concentration of conflicts among uses is higher.

The multi-scale approach is needed in the other direction as well; a zooming out perspective is useful to establish links with MSP actions and initiatives occurring at the Mediterranean scale or with framing European policies and documents.

Integration

Integration is an essential feature of MSP; indeed it can be found in various MSP principles and can assume different meanings:

- • integration among the environmental, social, economic and governance dimensions is required to elaborate solutions able to properly respond to real sustainability objectives;
- • integration among sectors enables to go beyond sector policies, plans and legal instruments and provide win-win solutions for more than a single use of the sea;
- • vertical and horizontal cooperation among administrations and technical agencies is a required step to proceed towards coordination and integration of sector policies and plans;
- • integration between terrestrial and maritime planning is essential to harmonise and ensure coherence among parts of the same system that interact each other through a relevant number of socio-economic and ecological processes.

Four dimensions

MSP operates within three dimensions, addressing activities (a) on the seabed; (b) in the water column; and (c) on the surface. This allows the same space to be used by different purposes; for example, the exploitation of the seabed for sand extraction can be managed compatibly with maritime transportation. Time should also be taken into account as a fourth dimension (EC COM(2008) 791). For example temporal zoning can be used to prohibit access to and fishing in areas used by marine species during the reproductive season, allowing these activities during less ecologically critical periods.

In some cases the 4D dynamic needs to be studied in details; contemporary protection of benthic biodiversity and fishing occurring in the water column, however possible in principle, should be avoided if ecological relationships along the vertical dimension are essential for benthic communities.
Long-term perspective
To ensure implementation of the common and shared vision of the Adriatic Sea a long-term perspective must be considered and applied in all the phases of the MSP process. Long-term objectives are essential in dealing with the strategic and anticipatory nature of MSP and allow to plan and implement actions in a period long enough to get concrete results. MSP must therefore ensure that short-term goals do not compromise the long-term goals. The long-term perspective is also essential in dealing with the challenges set by climate change adaptation of the marine and maritime sectors.

Stakeholder participation
Stakeholder participation is required in all stages of the MSP process. Not only stakeholders’ involvement can provide sources of knowledge and help in shaping data in forms operationally useful for maritime spatial planning, it is also essential in achieving broad acceptance of the maritime spatial plan and support to its implementation. It is really important that stakeholder participation is organised ensuring a fair balance among various stakeholder typologies (e.g. representatives of: international organisations, national authorities, regional to local administrations, technical agencies, economic sector, NGOs, environmental and social organisations, research institutions, etc.) and among the different geographic areas of the Adriatic Sea. It is also important that the process stimulate the participation of the Adriatic citizens in general, regardless of their partnership to any associations.

The concept of transparency is strictly connected to participation: the mechanism that brings to decision should be easily understood by all participants to the process and any data and document should be freely accessible.

Scientifically-based
Planning of maritime uses, resolution of conflicts and exploitation of synergic opportunities have to be based on a strong and high-quality data and knowledge base.

To this regard, any form of “good” knowledge must be taken in consideration, including that generated by people living and working at the sea. An important effort should be put in processing data in forms really useful for the decision-making process, including among the other thematic maps of current and future uses and maps of main conflicts. Exchange of knowledge (including MSP best practices) among Adriatic countries, with other Mediterranean countries and with MSP international initiatives launched in similar contexts (e.g. the Baltic Sea) should be encouraged and supported.

Legally binding
To be effective maritime spatial plans should be legally binding; this can reinforce commitment of Adriatic actors in ensuring their participation in the long-term. As recalled in the EC COM(2013) 133 premises (point 7) “planning of ocean space is the logical advancement and structuring of the use of rights granted under UNCLLOS and a practical tool in assisting Member States to comply their obligations”. However, at the scale of the Adriatic Sea, MSP must address the marine space not falling within national jurisdiction as well; this opens the ground to a relevant and wide discussion on international legal and governance issues.

Suitability and spatial efficiency
Suitability of human uses and spatial efficiency are guiding concept of the maritime planning process and aim to optimise the efficiency in the use of marine resources, minimise conflicts among uses and between uses and habitat protection, maximise synergies among uses.

The application of these principles implies that:
• The marine space and resources are used in the most efficient way, minimising impacts and maximising benefits.
• The sea space is reserved to uses really depending on marine resources and it is not just consider an area where land uses can be transferred. This concept must internalise the efficiency principle; a land use can be transferred to the sea if it generates higher benefits and produce lower impacts or conflicts.

• Immovable and not-renounceable uses and functions have priority in the space allocation and in the planning exercise. This can be for example the case of existing off-shore infrastructure or even of precious habitats providing essential ecological functions.
• Co-using must be encouraged as much as possible, proving its efficiency in the use of marine resources. Synergy among uses shall be based on the optimal exploitation of the 4-dimensions of MSP.

The concept of spatial efficiency shall also ensure a fair distribution within the Adriatic basin of advantages and disadvantages of MSP.

Connectivity
The connectivity concept implies that maritime spatial plans focus on connections beyond administrative limits, which can generate social, economic, environmental and governance benefits within the MSP perspective. Connectivity can be related to:
• Linear elements, as for example: (i) shipping lanes (e.g. Adriatic Motorways of the Sea) and ports connections to be approached together to develop an integrated and efficient maritime transport system in the Adriatic Sea, (ii) cables and pipelines connecting different countries and regions, enabling to approach energy distribution issues at the basin scale (e.g. Trans Adriatic Pipeline).
• Patches, in terms of connection of areas with similar or interrelated uses or functions. Connection of patches is particularly important for biodiversity preservation, acknowledging within MSP the fundamental ecological role of links between different habitats supporting the life cycle of Adriatic species (e.g. spawning ground, nursery areas, feeding sites, etc.). Together with the habitats (patches), connections should be preserved through blue corridors (linear elements) for living species (similarly to the land concept of ecological network);
• Both are essential in preserving the needed space for ecological processes. Connection of patch elements is also related to networking of marine protected areas.

Cross-border cooperation
Cross-border cooperation in MSP is essential at all levels: methodological (e.g. common methods, data and information sharing, best practice exchange, etc.), strategic (elaboration of a joint vision; definition of shared principles, objectives and targets; cross-sectoral planning), implementation (including shared monitoring, evaluation and progressive adjustment). Relevance of cross-border cooperation is also stressed by art. 12 of the proposed Directive establishing a framework for MSP and ICZM, that invites Member States to cooperate “to ensure that maritime spatial plans and integrated coastal management strategies are coherent and coordinated across the coastal zone and/or marine region and sub-region concerned. Such cooperation shall in particular take into account issues of a transnational nature, such as cross-border infrastructure”. Cross-border cooperation in the Adriatic Sea is considered particularly necessary by Shape partners on the following MSP-related issues:

• Data gathering and exchange; constituting a necessary initial step in any cooperation initiative dealing with planning and management of cross-border issues. Cross-border cooperation could be very useful in covering major existing gaps, as those related to offshore areas and the deep sea.
• Fishing and conservation of fish stocks; considering the relevance of this socio-economic activity for both shores of the Adriatic Sea, the intense pressure on natural stocks, the need of basin scale assessment on the real consistency of
fish stocks and shared rules for their sustainable management.

• **Environment**, recognising the existence of cross-border environmental problems (such as eutrophication of coastal waters, chemical pollution in hot-spot areas, marine litter, marine transport’s impacts, biodiversity loss, marine habitat degradation, etc.) and the opportunity provided by the implementation of MSFD at the basin scale. Cross-border cooperation will be strategically important to ensure coherence of MSFD application and the achievement of MSFD goals (i.e. GES by 2020) in the whole Adriatic, including the “open sea”, i.e. marine areas not falling under national sovereignty and jurisdiction.

• **Spatial planning and regional development**, that calls directly for the implementation of an MSP approach at the Adriatic scale, coherently with the strategic objectives and pillars of the EC Blue Growth policy and EU Strategy for the Adriatic and Ionian Region. Particularly relevant for this issue is the coherent and harmonised implementation of MSP and ICZM at the basin scale.

• **Maritime transport** and the related port services, due to the high and increasing relevance of these activities in the Adriatic basin, including industrial and commercial maritime transportation, passenger shipping, cruising, and coastal and marine tourism. Cross-border cooperation is essential to: develop an integrated and efficient maritime transport system with improved hinterland connections (intermodality), provide the needed connectivity among Adriatic countries and coastal regions, ensure safety and security conditions, develop joint monitoring and response systems to cope with environmental impacts (including major accidental events as oil spills), etc.

• **Nature conservation**, acknowledging that the Adriatic Sea is not only characterised by intense human uses but also by coastal and marine areas of high naturalistic relevance and stressing the relevant role played by the Adriatic Sea in providing essential ecosystem services. The issue of nature conservation is strictly related to the need to improve networking among marine and coastal protected areas within the umbrella of the EC Natura 2000 initiative. Furthermore as highlighted in the chapter of this handbook dealing with the common vision for the Adriatic Sea, climate change adaptation and marine research and innovation represent cross-cutting issues to be approached in a cooperative perspective. When implementing the MSP process, each of the identified key issues for cross-border cooperation in the Adriatic Sea will require the definition of a shared specific vision and related objectives and actions.

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**B6 - In which sector cross-border cooperation in the Adriatic Sea is particularly necessary?**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Data gathering and exchange</td>
<td>70%</td>
</tr>
<tr>
<td>Spatial planning and regional development</td>
<td>60%</td>
</tr>
<tr>
<td>Maritime transport</td>
<td>50%</td>
</tr>
<tr>
<td>Nature conservation</td>
<td>40%</td>
</tr>
<tr>
<td>Coastal defence engineering</td>
<td>30%</td>
</tr>
<tr>
<td>Maritime and cultural heritage</td>
<td>20%</td>
</tr>
<tr>
<td>Sand extraction and dredging</td>
<td>10%</td>
</tr>
<tr>
<td>Mineral extraction</td>
<td></td>
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<tr>
<td>Aquaculture</td>
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<tr>
<td>Tourism and recreation</td>
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<tr>
<td>Military use</td>
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<td>Marine research</td>
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<td>Marine surveillance</td>
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<tr>
<td>Renewable energy</td>
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<tr>
<td>Non-Renewable energy</td>
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<tr>
<td>Fishing and conservation of fish stocks</td>
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<tr>
<td>Environment</td>
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</table>

**Sectors for which cross-border cooperation in the Adriatic Sea is particularly needed according to Shape partners.**
MSP step-by-step in the Adriatic Sea

“MSP is a practical way to create and establish a more rational organization of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems, and to achieve social and economic objectives in an open and planned way” (DEFRA, 2008; Ehler and Douvere, 2009). Coherently with this definition, according to EU policy documents “MSP is a tool for improved decision-making. It provides a framework for arbitrating between competing human activities and managing their impact on the marine environment. Its objective is to balance sectoral interests and achieve sustainable use of marine resources in line with the EU Sustainable Development Strategy” (EC COM(2008) 791).

The variety of definitions is reflected by the variety of adopted methodologies; i.e. there is not a single approach responding to all strategic objectives and adapting to all marine contexts. MSP should be shaped and based on the specificities of individual marine areas that are concretely approached in its implementation. However, there are common steps that are considered in most of MSP initiatives and guiding documents, as: data collection and analysis, stakeholder consultation and the participatory development of a plan, the subsequent phases of implementation, enforcement, evaluation and revision.

The principal output of the MSP process is a spatial management plan that provides a concrete representation of a future strategic vision of the considered marine area. Given the relevance of spatial suitability and efficiency in MSP, mapping and zoning are essential parts of the spatial management plan, together with a sistem of regulation of uses that can contribute to limit conflicts and capitalize co-location opportunities. The system of regulation enables also to properly take account for the fourth MSP dimension, i.e. time.

Equally important is the process aspect of MSP: “MSP does not lead to a one-time plan. It is a continuing, iterative process that learns and adapts over time” (Ehler and Douvere, 2009). This process must be able to involve all coastal and marine actors, ensuring that different stakeholder typologies and geographic regions are properly represented.

The maritime spatial plan does not replace other integrated (as in particular ICZM ones) or sector plans. On the contrary it has to integrate with other plans and represent in spatial features the requirements arising from other policy and directives, as for example MSFD or Natura 2000 ones; actually these requirements can even assume the consistency of immovable elements of the MSP process (as for example in the case of Natura 2000 sites).
 plan implementation and evaluation

2. Laying the ground for MSP - Stocktaking about the current state of the coastal and marine space; mapping of current uses and pressures; identifying spatial impacts of uses and compatibility/incompatibility among uses

1. Drawing-up a guiding vision - Developing a vision describing what is desired for the area in question

3. Refining the stocktake and mapping - Refining data collection and analysis focusing on: more detailed scales, major spatial impacts and conflicts, particularly sensitive areas, etc.

4. Identifying issues and problems - Drawing up maps of conflicts; assessing vulnerability on the basis of collected data; focusing the analysis on most relevant issues and problems related to MSP

5. Developing solutions for the problems identified - Rating impacts and conflicts, defining priorities of uses over others and identifying future uses; planning concrete objectives to develop solutions

6. Drawing up a plan - Zoning; drawing up cartographic visualization; drafting a document describing the specific measures to be applied (uses regulation)

7. Implementation - Setting out responsibilities and priorities; identifying timeline and costs; raising awareness and highlighting MSP benefits; ensuring political commitment and responsibility

8. Evaluation and reviewing - Spatial monitoring and indicators; evaluating the delivery (objectives) of the plan; evaluating the benefits and impacts of the plan; adjusting/reviewing the plan

1.1. Starting the process - Assessing the need and will to undergo an MSP process

1.2. Starting the process - Defining a vision, planning principles, the legal framework and strategies

2. Undertaking initial stocktaking and systematic assessments of suitable areas for relevant uses

3. Finding out compatibilities and conflicts of claims for use in an interactive process with stakeholders and based on sound mapping and analysis

4.1. Drafting a maritime spatial plan with zoning of areas for specific uses or objectives, and completing the related environmental report (according to SEA)

4.2. Discussing the draft plan including detailed regulations for the zones with stakeholders. Stakeholders’ involvement in this phase can include more than one step focusing on plan drafting and consultation

5. Producing a final Maritime Spatial Zoning Plan including regulations for management and monitoring and obtaining final stakeholders comments

6.1. Adopting the plan and organizing implementation

6.2. Monitoring the Plan implementation and its effects

6.3. Revision and adjustment of the plan, to take account of changes that may have occurred and monitoring results

6.4. Defining alternative spatial and temporal management scenarios; selecting the preferred spatial sea use scenario

6.5. Preparing and approving the Spatial Management Plan - Identifying alternative spatial and temporal management measures and defining criteria for their selection; developing the plan including zoning, evaluating and approving the spatial management plan

6.6. Implementing and enforcing the Spatial Management Plan - Implementing measures through concrete actions; ensuring compliance with the plan’s requirements, enforcing the spatial management plan

6.7. Monitoring and evaluating the performance - Developing the performance monitoring program including indicators and targets; evaluating performance monitoring data; reporting results of performance evaluation

6.8. Adapting the Spatial Management process - Reconsidering and redesigning the MSP program (goals, objectives, outcomes and strategies); identifying applied research needs; starting the next rounds of MSP

1.2. Obtaining financial support - Estimating the costs of MSP activities, identifying alternative financing mechanisms; defining the feasibility of alternative funding mechanisms

2. Organising the process through pre-planning - Creating the MSP team; developing a work plan; defining MSP boundaries and timeframe; defining MSP principles, goals and objectives; identifying risks and developing contingency plan

3. Organising stakeholder participation - Defining who should be involved in MSP, when to involve stakeholders, how to involve stakeholders; developing a plan for stakeholder participation

4. Defining and analysing existing conditions - Collecting and mapping information about ecological, environmental and oceanographic conditions; mapping human uses; identifying current conflicts and compatibilities

5. Defining and analysing future conditions - Projecting current trends of existing human uses; estimating requirements for new demand of marine space; identifying possible alternative future scenarios; selecting the preferred spatial sea use scenario

7. Identifying alternative spatial and temporal management measures and defining criteria for their selection; developing the plan including zoning, evaluating and approving the spatial management plan

8. Implementing measures through concrete actions; ensuring compliance with the plan’s requirements, enforcing the spatial management plan

9. Monitoring and evaluating the performance - Developing the performance monitoring program including indicators and targets; evaluating performance monitoring data; reporting results of performance evaluation

10. Adapting the Spatial Management process - Reconsidering and redesigning the MSP program (goals, objectives, outcomes and strategies); identifying applied research needs; starting the next rounds of MSP

Comparison of MSP approaches
MSP step-by-step in the Adriatic Sea

Three guiding and inspiration documents have been analysed and compared for the purposes of this handbook, i.e.:

- BaltSeaPlan documents, as in particular “BaltSeaPlan Vision 2030. Towards the sustainable planning of Baltic Sea space” and “Become a maritime specialist within 10 minutes”, that focus on a transboundary closed sea (i.e. the Baltic Sea) having some characteristics similar to the Adriatic Sea ones.
- “Handbook on Integrated Maritime Spatial Planning” developed by the PlanCoast project, that included in its analysis the Adriatic Sea, together with Baltic and the Black Sea.

The methodological information included in these documents was used as a basis to define the steps for MSP implementation in the Adriatic Sea. These steps focus on aspects that are relevant at the basin scale and that therefore should be approached through cross-border cooperation. The identified eight steps do not simply constitute a linear process; feedback loops can be built into the process, linking different steps. For example the elaboration of future scenarios can trigger the search for new data and information that were not considered initially. Stakeholder participation can (and should) influence most of the planning steps; this may require going back to previous approached steps.

**Step 1 - Starting the process and getting organised**

This step deals with all the issues that need to be clarify and organised before starting the real planning process. Firstly it is essential to identify why the cross-border MSP process is needed and therefore what are the overall objectives and the expected results; this implies the assessment of needs and will to effectively undergo the process. Strictly related to this point is the identification of the authorities that have the interest and responsibility in MSP and must therefore be involved in the maritime spatial plan’s design and implementation. Implementation authorities should be identified as early as possible to be fully part of the process since its beginning and to be constantly in contact with authorities (if different) and experts that are in charge of the plan development. Based on this initial strategic analysis, several specific issues need to be approached in this pre-planning phase, including:

- Development of the process work plan, identifying: specific activities included in each step, outcome of each step and activity, links among steps (including feedback loops), schedule, timeline, milestones, deliverables, risks and possible solutions (contingency plan).
- Identification of the MSP area and scale of application; this should include the evaluation of the need of a nested multi-scale approach.
- Identification of the MSP timeframe, setting the temporal limit of the future vision, scenarios and plan.
- Definition of the MSP working group, including all needed expertise, and detailed identification of roles (e.g. process leader, step coordinators, experts, data analysts, mappers, facilitators, motivators, communication and dissemination experts, etc.).
- Organisation of stakeholder participation, defining who must be involved as well as when and how stakeholders will take part to the process. This activity shall also clarify what is the stakeholders’ expected contribution along the various steps of MSP development and implementation.

Finally, step 1 of the MSP process must estimate expected costs and identify possible (internal and external) source of funding.

**Step 2 - Assessing the context and defining the overall framework for MSP**

Normally, MSP takes place in a dynamic and complex policy context that needs to be assessed, in particular to identify what are the existing inputs to the MSP process and the existing gaps. This step includes the analysis and evaluation of available MSP related legal documents, policies and plans, issued at various levels (international, EU, macro-regional, national, regional and in case local; cfr. chapters 2 and 3). Considering a pan-Adriatic perspective, particular attention must be given to any cross-border policy initiative that may play a relevant role in shaping the MSP process in this basin. Relevant documents are not only those specifically dealing with MSP, but also those approaching related issues, as: ICZM, Blue Growth, IMP, MSFD, Natura 2000, marine knowledge, etc. The analysis should clearly identify what is the status of the legal framework for MSP, in particular in relation to UNCLOS provisions. This aspect assumes high relevance when a cross-border approach is called into question, in particular in the Adriatic Sea, due to the existence of some undefined situations.

The second pillar of MSP frameworking is the definition of a strategic vision of what the marine area should be in the future. The vision shall aim to support the sustainable management of the approached area as a whole, according to an holistic perspective. At the same time it should ensure that sustainable management is spread in all involved countries and regions, taking in consideration specificities of different areas. Initial elements of a pan-Adriatic MSP vision are discussed in chapter 4 of this handbook and intend to be a first stimulus for a deeper and more extensive reflection. To be effective the vision should be:

- simple, in a way it is immediately understandable by anyone and easily communicable;
- inclusive of relevant economic, environmental, social and governance aspects;
- holistic, providing a cross-sectoral view of issues that are often regarded separately;
- focused on future benefits of the MSP process, in a way it can orientate MSP implementation towards concrete results;
- long-term viewing.

Once the vision is in place, it must be articulated into objectives and targets. The following steps of the MSP process will then translate the vision in alternative scenarios and in a tangible spatial framework. The vision is not set in a stone; other activities of the MSP process (as scenarios building, plan development and the continuous stakeholders’ participation) can contribute to optimise the vision. More consistently the vision can be adjusted and reshaped at any cycle of the MSP iterative process.

**Step 3 - Analysing existing conditions**

Step 3 heavily relies on data availability, in particular as far as spatial information is concerned. Therefore, it initially requires: an accurate stocktaking of available sources of data and information, quality assessment and control of gathered data, development of data sharing protocols and platforms, and identification of existing gaps. Some of the gaps could be approached during the MSP process; however it is rather important to limit the scope of data collection to avoid too intense use of resources in this step of the process. Other gaps should be covered by specific surveys, investigations and projects to be run independently (and in case in parallel) to the MSP process.

The main goal of step 3 is the understanding and representation of the existing conditions of the marine area. Given the spatial nature of MSP the core of step 3 is represented by mapping of: ecological, environmental and oceanographic conditions; coastal and marine human activities; sensitive areas; spatial impacts (i.e.
the marine space affected by a human activity in terms of direct demand and impacted area), and vulnerability assessment (e.g. to oil spills or marine littering). However, beside maps, other data might be required, in particular to clearly understand the real occurrence of conflicts or synergies. Other useful information can for example include quantitative data on the intensity of marine human activities or their regulations in space and time. Where quantitative data are not available, qualitative experts’ evaluation can be used, at least in a first run of the MSP process; in this case stakeholders’ contribution can also be relevant (e.g. identification of fishing areas provided by fishermen). Furthermore, the analysis of the existing conditions should not forget to take in consideration the current (environmental and socio-economic) impacts of marine activities on the mainland and impacts of coastal activities on the sea, enabling to understand in details land-marine connections.

Based on the collected information, step 3 foresees the identification, assessment and spatial representation of existing conflicts among uses and between uses and (ecologically and environmentally) sensitive areas. The analysis must also identify compatibilities among marine uses and between those uses and the environment, to investigate any possible synergy and chance of co-location of human activities (including biodiversity and habitat preservation). Spatial incompatibilities can be also determined by sea-land interactions, as for example coastal tourism requiring a clean bathing environment and unimpeded views of the marine horizon. The identification of compatibilities and conflicts is surely based on technical analysis and mapping, but should also take in consideration the results of an interactive process with stakeholders.

The analysis of existing conditions, including the identification of conflicts and compatibility, should also carefully consider the opportunity and need of a multi-scale approach. Detailed information can be collected and mapped for those areas identified as most sensitive or promising in terms of MSP. Downscaling the analysis and enabling to take in consideration uses that may only take place in specific locations.

The organisation of spatial data in a Marine Information System (MIS) is highly suggested in this phase of the process. The adoption of a web-based solution can be particularly useful in supporting data sharing, comparison and integration, as it is actually required by a cross-border approach. A shared web-based MIS offers a high potential for data and metadata management, implying the following advantages: data and metadata are updated by data producers, responsibility of data and metadata quality check is shared among different subjects (again the data producers), reduction of management costs in particular related to the previous two issues, reduction of limitation to data accessibility related to restrictive data policy.

Shape project (WP5) designed and developed a Web Adriatic Atlas, aimed to collect and organise spatial information supporting ICZM a MSP.
Tools to improve the management of undersea sand deposits

Emilia Romagna Region has developed a series of databases and tools (some of which have been implemented within the Shape project) aiming to allow a better management of marine resources and a more effective maritime spatial planning. Developed instruments are: the information system at use at the sea (in_Sea), the information system for the management of the undersea sand stocks (in_Sand), the catalogue of nourishment interventions and coastal defense (in_Defence).

In_Sand was developed thanks to an agreement with CNR-ISMAR of Bologna and it enables to examine and process all the data (seismic, geological, morphological, etc.) concerning marine sand stocks and, through a dedicated tool, to update the residual sand volumes. Overlapping of data contained in in_Sand with those included in in_Sea has allowed defining more accurately the dredging areas free from other constraints and uses and, above all, to define conflicts, as for example those related to the presence of submarine permanent structures (pipelines, underwater cables, platforms, etc.). In_Sand also provides information on available sand resources, essential for planning the coastal defense strategy in a climate change perspective. Moreover, data relating to dredged sand and areas of replenishment will be also uploaded in the in_Defence database. The viewer unit enables user to observe spatial data in an interactive way and in a 3D environment. User can observe changes in selected spatial zone and analyse all concerning and available spatial data. The application also enables the use of different tools which are being further tested and developed for enhancement of performance.

Categories of available thematic layers included in the GIS are: spatial units (e.g. cadastres, spatial implementing acts, land use, addresses, protected areas, recreational zones, etc.), municipal infrastructure (e.g. sewage system, water supply, etc.); electricity infrastructure, underwater objects, data processing (the results of processing different layers with available tools), 3D models.

GIS for marine and coastal area management in Slovenia

Slovenian coastline is approximately 47 km long. It is an area of valuable natural and cultural heritage, natural resources and extraordinary landscape, but also under strong development pressures, such as urbanisation, port operations, tourism, farming, fishing and mariculture. Management of such complex system is therefore of crucial importance. To this end a special GIS tool was developed within the Shape project; the GIS covers: 100 meters coastal zone ("setback zone"), coastal areas protected by sectoral legislation and 200 meters offshore belt. Potential users of GIS are coastal municipalities, national administrative units, ministries, public institutes and their local branches, etc.

The application is made of two units - control and viewer - interconnected with the database. The viewer unit enables user to observe spatial data in an interactive way and in a 3D environment. User can observe changes in selected spatial zone and analyse all concerning and available spatial data. The application also enables the use of different tools which are being further tested and developed for enhancement of performance.

Examples of MSP thematic maps at the Adriatic Sea (partial spatial coverage) and Veneto Region scales.

Source: Regional Development Centre Koper
Step 4 - Analysing future conditions
MSP is a future-oriented process, thus the answer to the question “Where do we want to be?” is as essential as the understanding of current conditions. The strategic vision developed under step 2 orientates the whole MSP process, surely including the definition and analysis of future conditions.

Step 4 activities can initially focus on the analysis of current trends of needs of existing marine human uses and their projections into the future, to understand how the system would evolve without relevant changes of goals and objectives. Particularly important is the analysis of already existing integrated sector policy and plans, defining strategic and specific objectives as well as concrete actions for the future evolution of the marine area, including those relevant in terms of new demand of the sea space (e.g. new uses or intensification of existing uses).

Results of above activities should then converge into the elaboration of alternative scenarios, coherently with the framework indications provided by the shared vision. Scenarios elaboration and assessment actually represent the core of step 4. A scenario can be defined as an image of the future developed on the basis of assumptions that are coherent with the vision. The scenario therefore does not constitute a forecast, but rather a possible view, or a range of possible views, of how a given marine system may occur in the future.

The cross-border approach requires that alternative scenarios are developed through the involvement of all relevant Adriatic actors. It is therefore at this stage, together with the vision definition, that widespread stakeholder consultation becomes really essential. Developed scenario can be illustrated through descriptive storylines. In the MSP process, it is essential that these are then spatially represented through scenarios maps, showing the future evolution of maritime uses. Spatial sea use scenarios can illustrate the concrete consequences of implementing certain assumptions and objectives. This spatial representation does not need to be accurately detailed, since it is finalised to visualise the desired direction of how the marine space would be used in the future under different conditions. Based on the future uses’ representation, major conflicts and compatibilities should be identified for each scenario, including the business as usual one. Moreover, uncertainty related to the developed scenarios should be clearly illustrated.

The final result will be a number of alternative scenarios, coherent with the previously defined vision, each one providing a view of how the marine area will look in the future, in particular in terms of maritime uses and related conflicts, compatibility and impacts. A preferred scenario has to be selected; this will form the basis for the elaboration of the maritime spatial plan. Selection must be based on shared criteria, considering: socio-economic effects, environmental and ecological impacts, time required to achieve expected results, political effects (e.g. links with other plans, scenario acceptability), equitability of benefits distribution, financial feasibility (Ehler and Douvene, 2009).

Step 5 - Elaborating the Maritime Spatial Plan
The main aim of the maritime spatial plan is the optimisation of existing and future (as defined by the vision and the selected scenario) human uses, in a way that conflicts and impacts are minimised and synergic opportunities are capitalised. The form and contents of the plan heavily depend on the previous analytical and strategic analysis, in particular as far as vision elaboration, objectives and targets identification and scenario development are concerned. This is why the proposed methodology emphasises the role and importance of goals setting and analysis of current and future conditions. At this stage of the process, vision, strategic objectives and scenario must be translated into concrete and possibly quantitative goals (e.g. % of the whole marine area to be protected, maritime uses to be increased and those to be limited, connectivity to be strengthened or even established, etc.).

As a general rule it is stressed the importance that the plan is kept simple and practical (Schultz-Zheeden et al., 2008), to maximise the chance of its concrete implementation. This implies that theoretical background and results of the previous analytical steps, although surely important and necessary, are just summarised in the plan; details can be illustrated in separated technical documents.

A maritime spatial plan mainly consists of two parts: (i) maps showing zoning of areas for specific uses and objectives, (ii) regulations for the management and monitoring of the identified zones, aiming to avoid conflicts in case of co-location of uses and minimise environmental impacts. Zoning and regulation must take in consideration the 4-dimension nature of MSP; co-existing uses could be possible along the vertical dimension (seabed; water column and surface) or considering temporal differentiation.

Based on to the BaltSeaPlan experience (Gee et al., 2011) five main types of areas can be identified for zoning in the Adriatic Sea:

- **Priority areas**: where the priority is given to a specific use or group of uses (e.g. shipping lanes, offshore platforms, aquaculture, marine protected areas, areas for fish and shellfish restocking, diving or snorkeling areas, etc.). Other uses are allowed only if not conflicting with the priority one. Conflicting or conditionally compatible uses are excluded, due for example to security, economic or environmental reasons.

- **Reserved areas**: where a use, or group of uses, receives special attention, although it has not absolute priority as in the case of the first typology of areas. Balancing between uses, in particular conditionally compatible ones, receive particular attention in this typology of area.

- **No go areas for all uses**: where all human uses are prohibited. This typology can identify areas to be integrally protected, for example to preserve highly sensitive habitats playing a particular role in the life cycle of some species or to avoid any disturb to fragile marine species. It can also identify areas to be preserved for future development, although in this specific case temporary uses can be allowed.

- **No go areas for a certain use**: where a specific use is prohibited as incompatible with all the other uses.

- **Open use areas**: where no use has an absolute or conditional priority and all uses are allowed. The identification and delimitation of this kind of areas must be carefully evaluated to avoid underestimation of conflicts and impacts.

Identification of “innovable” elements is another important activity when dealing with zoning, Immovable and not-renounceable uses (e.g. port facilities, offshore extraction sites, habitats to be protected, etc.) have priority in the space allocation (either in priority or reserved areas). The space needs to be allocated to these firstly, since they cannot be radically moved to alternative locations. Although large spatial shift are not possible, co-use options and optimisation of the marine space demand are measures that must be implemented in the plan to limit conflicts and maximise synergies. Zoning and the designation of areas are not fixed. Besides being temporary (e.g. closure of a marine area for military operation or limitations of uses during a spawning period) zones must be periodically reviewed taking in consideration the evolving context and the generation of new knowledge. As stressed by step 8 of the proposed methodology, adaptation is essential for the whole process. Because of the dynamic context of MSP, the focus should be on planning (including zoning) rather than on “producing a plan”.

The elaboration of the maritime spatial plan must be run in parallel with the assessment of its environmental effects. As required by the EC proposed Directive establishing a framework for MSP and ICZM (art. 11) maritime spatial plans must be subject to Strategic Environmental Assessment. Indeed it is relevant that assessment is extended to socio-economic effects of the plan, as proposed by the Territorial Impact Assessment approach. Finally, it is stressed the importance that the draft plan (including both zoning and regulation) and the related assessment report (according to SEA) are discussed with all relevant stakeholders, to ensure that the plan is publicly accepted. Discussing the plan can include more than a single consultation step and should foresee a conclusive event, validating the final version of the maritime spatial plan.
Within this main aim, DAMAC realised a Geographical Information System to support terrestrial and maritime spatial planning; the GIS collects a variety of spatial information such as: sea mapping of explosive remnants of war (ERW), offshore platforms (gas and oil), man axes of maritime traffic, sea traffic control sectors of the Mandatory Ship Reporting System of Adriatic Traffic; oil spill detection by satellite; radio, telephones, coastal sounds presence, etc.

Among the other activities, DAMAC focused on the interdisciplinary analysis of maritime traffic in the Adriatic Sea, including in particular the evaluation of its environmental impact on coasts and marine ecosystems and the resolution of major conflicts with other uses of the maritime space. A monitoring and coastal warning system was therefore realised, based on the integration of different instruments and mathematical models, which are normally used independently, by different government departments and bodies and with different purposes. The system enables to archive and analyse data from various fixed and mobile devices, which operate in continuous and in an integrated manner in order to forecast possible maritime traffic pollution.

Some of the installed devices include: (i) a fixed radar providing data on targets in a range of 30-35 nautical miles, (ii) a mobile radar with function of “oil spill detection”, (iii) a weather and current model developed in collaboration with the Politecnico-University of Marche - DISVA in order to forecast the movement of pollutants that may be dispersed as a result of an accidental release into the sea, (iv) an AIS (Automatic Identification System) antenna, and (v) a data analysis software for the evaluation of the ships’ environmental performance and reliability.

Elaboration of thematic mapping considered a wide set of maritime and coastal elements identified as relevant for MSP implementation; in particular maps were grouped into four categories: physical and administrative limits, uses of the maritime space, marine areas with high natural value, coastal elements that are relevant in dealing with MSP. Finally, a map showing main maritime uses together was elaborated to identify possible interferences and areas with high concentration of activities. To this regard, three main marine areas were identified: (i) the area facing Venice lagoon where a high concentration of human activities at the sea occurs and (ii) the Ravigo province and north-eastern Venice province areas that are characterized by a lower number of human activities. Buoy network data were used to analyse the evolution of meteor-oceanographic parameters during particular mid-ocean events (e.g. strong winds, exceptional and prolonged cold period, high river input, etc.) and to describe the in-out annual or seasonal evolution of physical-chemical characteristics of the water column. Afterwards, the potential use of meteor-oceanographic data within MSP was investigated. Based on the results of the above activities and the outcome of two stakeholder workshops, a set of recommendations for the sustainable use of the maritime space and marine resources in Veneto were identified, in agreement with principles defined by the MSP roadmap (EC, COM (2008) 797) and MSP guidelines (EEA and OCEAN, 2009; Gee et al., 2011). In particular recommendations focused on the role of scientific knowledge and monitoring in supporting maritime spatial planning.

The pilot project focused on assessment of the environmental features and problems in the marine and coastal zone of the MPA of Torre Guaceto and the neighboring port and industrial area of Brindisi. In the first phases updated data and information were collected, focusing on key topics such as: geomorphology, climate, oceanography, marine-coastal biological communities, terrestrial habitats, flora and fauna species, environmental protection, land and sea uses, planning and regulation system. Much of this information was processed and mapped with GIS.

In the second phase 70 indicators were selected and calculated, referring to the DPSIR methodology. In order to better discriminate the environmental status of the marine and coastal zone subjected to different pressures, the study area was divided in three subareas: (a) the Marine Protected Area of Torre Guaceto; (b) the area included between the previously mentioned MPA and the urban and industrial area of Brindisi; (c) the urban and industrial area of Brindisi. Those three subareas were further divided into fifteen sectors, nine located on the land side and six located on the sea side.

Among the three subareas, the one including the industrial site and the town of Brindisi (subarea "c") showed higher levels of Drivers and Pressures, the worst Status (with the higher level of Impacts) but also a significant level of Responses. The comparison between Driver-Pressure and State-Impact indices showed a straightforward linear and inverse relationship. Not the same linear relationship was found between Driver-Pressure and Responses, and this appears to be a weak point of the overall system of policy and environmental management in the investigated area. The results highlighted that the Responses measures are mainly taken into account in two sectors, when an area is under a restriction regime (i.e. marine or coastal protected area, as it occurs in the subarea “a”) or when the environmental situation has reached a non-return point, as in the case of the industrial area of Brindisi (subarea “c”). The in-between area (mostly occupied by the subarea “b”) is the one that has the higher risk to fail a sustainable environmental management.

Source: Puglia Region and ARPA Puglia

Shape pilot project

Analysis of multiple stressors operating in the MPA of Torre Guaceto and neighboring coastal area of Brindisi port with inclusion of the industrial area: a DPSIR approach

The pilot project focused on assessment of the environmental features and problems in the marine and coastal zone of the MPA of Torre Guaceto and the neighboring port and industrial area of Brindisi. In the first phase updated data and information were collected, focusing on key topics such as: geomorphology, climate, oceanography, marine-coastal biological communities, terrestrial habitats, flora and fauna species, environmental protection, land and sea uses, planning and regulation system. Much of this information was processed and mapped with GIS.

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Source: Puglia Region and ARPA Puglia

DAMAC area of interest

The DAMAC Project

DAMAC was a project funded by the Interreg IV Program that was developed by Marche Region and Zadar County with the main aim to promote concrete actions supporting the sustainable development of these two areas of the Adriatic basin.

Shape pilot project

From scientific knowledge to the sustainable management of the Veneto maritime space

The Veneto-Region pilot project aimed to identify recommendations for the best use of available scientific knowledge to support the sustainable management of marine resources and the maritime space, i.e. MSP and its integration with ICZM.

The project considered and analysed two main typologies of data: (i) spatial data needed to elaborate thematic, maps of main uses of the Veneto maritime space; (ii) meteo-oceanographic data, in particular those measured by the Veneto Region buoy network.

Elaboration of thematic mapping considered a wide set of maritime and coastal elements identified as relevant for MSP implementation; in particular maps were grouped into four categories: physical and administrative limits, uses of the maritime space, marine areas with high natural value, coastal elements that are relevant in dealing with MSP. Finally, a map showing main maritime uses together was elaborated to identify possible interferences and areas with high concentration of activities. To this regard, three main marine areas were identified: (i) the area facing Venice lagoon where a high concentration of human activities at the sea occurs and (ii) the Ravigo province and north-eastern Venice province areas that are characterized by a lower number of human activities. Buoy network data were used to analyse the evolution of meteor-oceanographic parameters during particular mid-ocean events (e.g. strong winds, exceptional and prolonged cold period, high river input, etc.) and to describe the in-out annual or seasonal evolution of physical-chemical characteristics of the water column. Afterwards, the potential use of meteor-oceanographic data within MSP was investigated. Based on the results of the above activities and the outcome of two stakeholder workshops, a set of recommendations for the sustainable use of the maritime space and marine resources in Veneto were identified, in agreement with principles defined by the MSP roadmap (EC, COM (2008) 797) and MSP guidelines (EEA and OCEAN, 2009; Gee et al., 2011). In particular recommendations focused on the role of scientific knowledge and monitoring in supporting maritime spatial planning.

Based on the results of the above activities and the outcome of two stakeholder workshops, a set of recommendations for the sustainable use of the maritime space and marine resources in Veneto were identified, in agreement with principles defined by the MSP roadmap (EC, COM (2008) 797) and MSP guidelines (EEA and OCEAN, 2009; Gee et al., 2011). In particular recommendations focused on the role of scientific knowledge and monitoring in supporting maritime spatial planning.

The Veneto Region pilot project aimed to identify recommendations for the best use of available scientific knowledge to support the sustainable management of marine resources and the maritime space, i.e. MSP and its integration with ICZM.
**Step 6 - Adopting the Plan and organising implementation**

In general, the plan implementation is not responsibility of spatial planners. However, it is a critical step to give conciseness and credibility to the whole process, and reach the expected benefits. Experts involved in the plan design, and more in general in the other steps of the MSP process, can facilitate the implementation through various organisational actions, i.e.:  

1. Identify implementation authorities as early as possible to fully involve them into the process since its beginning, as foreseen by step 1 of the proposed methodology. The descriptive part of the plan should define who is responsible of what during the implementation phase.

2. Technically support the implementation authorities in the endorsement phase and in converting the plan into actual operative programmes, voluntary agreements and specific regulations. The operative program shall specify timeline for implementing the plan, milestones, estimated costs of implementation, estimated costs for priority actions, and possible financial sources. These elements could be even included in the maritime spatial plan (step 5); however it is essential that they are defined in agreement with the implementation authorities.

3. Provide technical support to vertical and horizontal coordination mechanisms put in place to implement the plan. This phase can be particularly important to ensure that a cross-border MSP plan is not ignored at lower levels (from national to local). Maps of conflicts, spatial sea use scenarios, zoning maps are all tools that can improve political awareness on MSP benefits and that can trigger interest and actions. Ultimately all possible actions to ensure political long-term commitment should be put in place.

4. In parallel with implementation, dissemination of the maritime spatial plan and expected benefits to a stakeholder arena wider than the one involved in the process (with a particular concern for citizens) is important to increase awareness and in turn improve the plan acceptance.

**Step 7 - Monitoring the Plan**

“Monitoring is a continuous management activity that uses the systematic collection of data on selected indicators to provide managers and stakeholders with indications of the extent of progress toward the achievement of management goals and objectives” (Effer and Douvere, 2009). At least three types of monitoring and assessment are relevant in MSP:

- monitoring and assessing the state of the marine system;
- monitoring and assessing expected benefits of the maritime spatial plan;
- monitoring and assessing the MSP process.

The state of the system has to be regularly analysed to assess any change (also induced by the maritime spatial plan implementation) in the political, legal and planning context, as well as in the existing conditions of the marine areas (i.e. ecological, environmental and oceanographic conditions, coastal and marine human activities, sensitive areas, spatial impacts and vulnerabilities).

The revision of the current condition assessment is also triggered by new data and knowledge on the marine system that can for example lead to better understand crucial oceanographic processes, discover new marine resources or highlight previously underestimated impacts and conflicts.

The second monitoring category is aimed to assess if the plan has delivered or is contributing to deliver the expected benefits. This implies that plan’s objectives and targets are clearly identified in the previous steps of the proposed methodology. In this perspective monitoring shall respond to the following key questions:

- Have impacts on the environment, habitats and species decreased?
- Have conflicts among maritime uses and between uses and (ecologically and environmentally) sensitive areas been successfully resolved?
- Have spatial incompatibilities between marine and coastal uses been successfully approached?
- Have possibilities of co-location of uses been fully investigated and capitalised?

- Have benefits been evenly distributed in the whole area of interest (i.e. the Adriatic Sea) ensuring equal opportunities for all countries and regions?
- Has the plan delivered benefits to all involved stakeholders?
- What are the socio-economic benefits triggered by the plan implementation?

Process monitoring aims to understand if the different MSP steps have been successfully and efficiently implemented, and in case identify corrective actions to improve the process. To this regard particular attention should be given to assess stakeholders’ satisfaction in relation to their involvement in the MSP process.

**Step 8 - Adapting the Plan**

Together with the ecosystem-based approach, adaptive management is recognised as a fundamental framework approach to cross-border MSP in the Adriatic Sea by this handbook, given the intrinsic dynamic, complex and evolving nature of the marine system. It can be simply described as a systematic approach for improving management through learning by monitoring and evaluation of outcomes (i.e. learning by doing).

Adjustment of the MSP process is therefore strictly dependent on the monitoring phase. Moreover it can be triggered by: new knowledge on the marine system, changes of strategic objectives about the considered area induced by factors external to the MSP process, changes in MSP related (integrated and sector) policies, adoption of new sector plans related to MSP aspects, new pressures from stakeholders, new technologies enabling more efficient co-existence of uses, etc.

The maritime spatial plan can be adapted to the new conditions acting on different interlinked components, including: the vision, strategic objectives and targets, future scenarios, concrete and operative goals, plan zoning, regulation of specific uses. The revision and adaptation phase is also essential to identify applied research needs, thus contributing to cover the existing knowledge gap.
Stakeholders’ participation

Stakeholders’ involvement and participation is considered a relevant component of the MSP process by all guiding documents that in great part of the cases highlight the cross-cutting and horizontal nature of this activity. The organisation (step 1) and implementation of stakeholder involvement and participation should consider the following issues:

- Identification of stakeholders; all key Adriatic stakeholders should be involved in the process, ensuring a balance among various typologies (e.g. representatives of international organisations, national authorities, regional to local administrations, technical agencies, economic sector, NGOs, research institutions, general public, etc.) and among the different geographic areas of the Adriatic Sea. However, the total number of involved stakeholders should not be too large to obstacle constructive discussion. Different typologies of stakeholders might require different “languages”, also to deal with different values and visions.

- Stakeholders should be involved during the whole process, including planning, implementation and monitoring steps. However, their involvement should be focused on essential moments and key required contributions, to avoid unsustainable pressure and possible disengagement.

- There are various modalities to involve stakeholders during the MSP process, including vertical (communication, information, consultation) and horizontal interactions (dialogue, concertation, negotiation). Step 1 should clearly identify what modality has to be activated and what specific tools (questionnaire, newsletter, forum, online-consultation, dedicated workshops, topic groups, interviews, participative mapping, etc.) have to be used for each required interaction with stakeholders.

- The planning phase of stakeholders’ participation should also be clear on objectives and expected outcome of each interactive step. It is important to inform stakeholders on how the results of their participation will be used within the MSP process, to give evidence of their concrete contribution to the maritime spatial plan and to avoid unrealistic expectations.

- Use of facilitators might be necessary to guide the participative process, in particular to: clearly introduce objectives and expected results of any participative step, involve all stakeholders in the discussion, take care of all viewpoints and contributions, and orientate the consultation towards concrete inputs for the MSP process.

- Stakeholders need to be constantly stimulated to take part into the process. The role of facilitators is in this perspective essential. The establishment of a good working atmosphere and constant and transparent communication is equally important. Furthermore, as also stressed in previous points, stakeholders will be more stimulated and involved if they can progressively see how their inputs are integrated in the whole process and how they contribute to the expected deliverable and benefits of MSP.

- Maps can be more powerful than documents in supporting stakeholders’ discussion on MSP topics, enabling to visualise elements to be discussed, as current marine uses, conflicts, spatial impacts, spatial scenarios, zoning, planned measures, etc.

- Awareness raising, education and training on the field in the initial stage of the participative process can improve stakeholders’ contribution to MSP.

Different types of stakeholder consultation (Ehler and Douvere, 2009)

Local shape event focus

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Focus</th>
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</thead>
<tbody>
<tr>
<td>August 2011</td>
<td>Istria, HR</td>
<td>Marine mapping supporting MSP</td>
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<tr>
<td>September 2011</td>
<td>Istria, HR</td>
<td>Team building in MSP</td>
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<tr>
<td>June 2012</td>
<td>Venezia, IT</td>
<td>MSP and ICZM in Veneto opportunities and conflicts</td>
</tr>
<tr>
<td>October 2012</td>
<td>Koper, SI</td>
<td>Regional workshop on ICZM and MSP</td>
</tr>
<tr>
<td>November 2012</td>
<td>Castello di Carovigno, IT</td>
<td>Pilot action in the coastal area between Torre Guado MPA and the urban and industrial area of Brindisi</td>
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<tr>
<td>March 2013</td>
<td>Koper, SI</td>
<td>Proposals of technical solutions for spatial planning documents</td>
</tr>
<tr>
<td>March 2013</td>
<td>Cavallino-Treporti, IT</td>
<td>Pilot project for the management of coastal SCI within an ICZM framework</td>
</tr>
<tr>
<td>April 2013</td>
<td>Pescara, IT</td>
<td>Local workshop on ICZM</td>
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<tr>
<td>April 2013</td>
<td>Strunjan, SI</td>
<td>SWOT workshop for Slovenia ICZM-MSP pilot project</td>
</tr>
<tr>
<td>June 2013</td>
<td>Pescara, IT</td>
<td>Local workshop on MSP</td>
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<tr>
<td>June 2013</td>
<td>Venezia, IT</td>
<td>From scientific knowledge to MSP in Veneto</td>
</tr>
<tr>
<td>June 2013</td>
<td>Goro, IT</td>
<td>Towards the development of the management plan of the sediments in the sea - inlet of Goro</td>
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<tr>
<td>June 2013</td>
<td>Budva, ME</td>
<td>Institutional framework for sustainable coordination of ICZM in Montenegro</td>
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<tr>
<td>September 2013</td>
<td>Venezia, IT</td>
<td>Prevention and education on plastic marine litter</td>
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<tr>
<td>September 2013</td>
<td>Slovenian coast, SI</td>
<td>Coastal clean-up</td>
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<tr>
<td>October 2013</td>
<td>Lignano, IT</td>
<td>Fishing activity and sediment management in the Marano and Grado lagoon; conflicts and synergies</td>
</tr>
<tr>
<td>December 2013</td>
<td>Bari, IT</td>
<td>Puglia’s pilot actions for Shape Project and Bologna Charter 2012: instruments for ICZM and MSP</td>
</tr>
<tr>
<td>January 2014</td>
<td>Koper, SI</td>
<td>Implementation of art. 8 of the ICZM protocol</td>
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<tr>
<td>February 2014</td>
<td>Tivat, ME</td>
<td>Management of Tivat Saline: implementation of ICZM at local level</td>
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<tr>
<td>February 2014</td>
<td>Campoassa, IT</td>
<td>Integrated management of the coastal and marine space and pilot projects in Molise</td>
</tr>
<tr>
<td>February 2014</td>
<td>Bologna, IT</td>
<td>Shape results in Emilia Romagna Region</td>
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</tbody>
</table>

MSP and ICZM regional and local Shape events including stakeholders’ participation
MSP is considered one of the fundamental tools (together with ICZM) for the implementation of the Integrated Maritime Policy of the European Union (EC COM(2007) 575). IMP considers the Marine Strategy Framework Directive as its environmental pillar. The ecosystem approach is the overarching principle of both MSP and MSFD and links between the two are surely relevant, although still matter of analysis and detailed definition. This is particularly true in the Adriatic Sea due to its limited extension, the relevant influence of land and marine-based human activities on the marine environment, and the strict interdependency between socio-economic development and the integrity of marine natural resources and processes.

Shape Action 4.2 identified preliminary recommendations for the implementation of MSFD at the scale of the Adriatic basin in a cross-border perspective, as resulted from the analysis of available documents and the discussion held among partners within the project (in particular during the meeting held in Pescara, April 2013). Preliminary recommendations were grouped in six categories, also referring to the Plan of Action defined by MSFD art. 5, i.e.: general recommendations, stakeholder participation in MSFD, initial assessment, determination of GES and establishment of environmental targets, monitoring programmes and programmes of measures.

As an overarching recommendation, Shape project stresses the importance of developing an overall and shared Adriatic Marine Strategy. Its elements should be coordinated across and agreed by all Adriatic countries (including no-EU ones) and should take in consideration both the Adriatic as a whole and specific characteristics of different areas of the basin. General recommendations are intended to support all phases of the process aiming to develop an Adriatic Marine Strategy, and can be summarised as follows:

- Base the development of the Adriatic Marine Strategy on two guiding principles: ecosystem-based approach and adaptive management.
- Extend “Marine waters” definition (MSFD art. 3.1) beyond areas under countries’ jurisdiction to properly take into account “open sea” specificities and problems.
- As a consequence of the above recommendation, strengthen the implementation of UNCLOS within the Adriatic Sea through cooperation among countries, thus improving the legal framework to MSFD and MSP.
- Establish a MSFD Adriatic Working Group (involving competent authorities and based on existing initiatives) in charge of giving concrete implementation to the Directive at the scale of the Adriatic Sea and to develop the Adriatic Marine Strategy. The MSFD Adriatic Working Group should be supported by Adriatic research institutions and agencies.
- Develop mechanisms and tools to facilitate know-how transfer to no-EU Adriatic countries ensuring these are fully part of the MSFD implementation process.
- Establish link with MSFD-related initiatives developed by UNEP-MAP as well as links with initiatives in other marine regions and sub-regions, as in particular those developed by Regional Sea Commissions (OSPAR for the North-east Atlantic, Helcom for the Baltic Sea and Black Sea Commission).
- Define a clear commitment to ensure continuity in the MSFD implementation process at the Adriatic scale, including commit to notify progress of MSFD implementation at the Adriatic scale to the EC.

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Relevance of MSP for the implementation of MSFD in the Adriatic Sea according to Shape partners.

Maruggio (Taranto, Italy) - photo by Puglia Region
Shape recognised the relevance of stakeholder participation in all the phases of the Adriatic Marine Strategy development, recommending to establish an Adriatic MSFD Stakeholder Forum that should work in close collaboration with the MSFD Adriatic Working Group.

As a further general recommendation, Shape stresses the importance of analysing in details links among MSP and MSFD in the Adriatic Sea and identifying how MSP can contribute to the achievement of MSFD goals in the basin, in particular in relation to the design of the programme of measures required by the Directive to achieve or maintain the GES. In this perspective, examples of MSP-MSFD links are summarised in the following points:

- **Spatial planning constitutes the core activity of the MSP process. In relation to MSFD goals this can positively contribute to:** (i) reduce marine-based source of pressure affecting the marine environment through spatial efficiency and control of temporal distribution of human activities, (ii) eliminate or reduce conflicts between maritime uses and protection of areas with high naturalistic and ecological relevance, (iii) clearly identify areas to be protected in order to preserve processes and functions that are essential in achieving the GES, (iv) identify environmental hotspot areas at sea where more intense measures are necessary, (v) avoid unsustainable uses in protected areas and identify synergies that can provide win-win solutions for socio-economic development and environmental protection, (vi) ensure connectivity among relevant habitats through blue corridors.

- In relation to the previous point, it becomes essential to promote MSP and ICZM integration that can take to the achievement of coherence between terrestrial and maritime planning, improving the integrated management of land and marine resources of pressure, and reducing impacts to the marine environment and enhancing integrated protection of land-sea habitats.

- Both MSP and MSFD require stakeholder involvement and participation. At the Adriatic scale it is important the two participation processes converge in joint initiatives, to: further explore and capitalise links among MSP and MSFD, share common approaches and information, better motivate stakeholders, and avoid unsustainable pressure on the same stakeholders' arena that can result in disengagement.

Marine habitat mapping in the Region of Istria

**The Region of Istria began the systematic mapping of its marine habitats in 2008 with the aim to designate potential marine NATURA 2000 areas. The Institute for Physical Planning Region of Istria contracted with the systematic mapping of marine habitats in the framework of the SHAPE project.** Habitats were mapped down to 40 meters of depth along the eastern coast, that is steeper and less indented, and the Southern and Western coasts, which are flatter and shallower. Mapping was done within the protected marine coastal zone, which according to Croatian legislation is 300 meters from the coastline towards the sea. Marine habitats of the Region of Istria were mapped by a team of specialists including biologist divers, diving instructors and C-category skippers.

The mapping activities allowed to collect extensive documentation, with more than 2000 underwater photos and over 10 hours of video material. These were linked to the database of the diving area to which they belong, together with the photos of the corresponding coastal zone. Altogether, 174 km of coastline and a total marine surface of 42,20 km$^2$ of the Region of Istria were mapped. Mapping identified new sea and endangered NATURA 2000 habitat types and 24 habitat types according to the Croatian habitat classification. The analysis of data about marine habitats will become the basis for the future sustainable management and use of the Region coastal zone. In particular it will be possible to provide information base for the elaboration of the Plan of Integrated Coastal Zone Management, as well as for the establishment and management of marine NATURA 2000 areas. More information on the project is available at http://shape.isra-istria.hr.
## List of Acronyms

<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AdriaPAN</td>
<td>Adriatic Protected Areas Network</td>
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<tr>
<td>AIS</td>
<td>Automatic Identification System</td>
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<tr>
<td>CAMP</td>
<td>Coastal Area Management Programme</td>
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<tr>
<td>CBD</td>
<td>Convention for Biological Diversity</td>
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<td>CC</td>
<td>Climate Change</td>
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<td>CCA</td>
<td>Climate Change Adaptation</td>
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<tr>
<td>CG</td>
<td>Coordination Group</td>
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<tr>
<td>CIS</td>
<td>Coastal Information System</td>
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<td>CAMP-ISMAR</td>
<td>Institute of Marine Sciences</td>
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<td>COP</td>
<td>Conference of the Parties</td>
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<td>COR-GEST</td>
<td>Correspondence Group on GES and Targets</td>
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<td>DAMAC</td>
<td>Environmental Protection of the Adriatic Sea and Communication</td>
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<tr>
<td>DG MARE</td>
<td>Directorate General Maritime Affairs and Fisheries</td>
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<tr>
<td>DPSIR</td>
<td>Driving forces, Pressures, States, Impacts and Responses</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<td>EcAp</td>
<td>Ecosystem Approach</td>
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<td>EcAp CG</td>
<td>Ecosystem Approach Coordination Group</td>
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<td>ECAT</td>
<td>Environmental Center for Administration and Technology</td>
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<td>EC COM</td>
<td>European Commission Communication</td>
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<td>Ecological Objectives</td>
<td>Ecological Objectives</td>
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<td>ERW</td>
<td>Explosive Remnants of War</td>
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<td>EU</td>
<td>European Union</td>
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<td>EUSAIR</td>
<td>European Union Strategy for the Adriatic and Ionian Region</td>
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<td>GES</td>
<td>Good Environmental Status</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>HELCOM</td>
<td>Helsinki Commission</td>
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<td>HR</td>
<td>Croatia</td>
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<td>ICZM</td>
<td>Integrated Coastal Zone Management</td>
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<td>IMP</td>
<td>Integrated Maritime Policy</td>
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<td>IOC</td>
<td>Intergovernmental Oceanographic Commission</td>
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<tr>
<td>IPA</td>
<td>Instrument for Pre-Accession Assistance</td>
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<td>ISPRA</td>
<td>Italian Higher Institute for Environmental Protection and Research</td>
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<tr>
<td>IT</td>
<td>Italy</td>
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<td>MATTM</td>
<td>Italian Ministry of the Environment, Land and Sea</td>
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<td>ME</td>
<td>Montenegro</td>
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<td>MedPAN</td>
<td>Network of Marine and Coastal Protected Areas managers in the Mediterranean</td>
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<td>MIS</td>
<td>Marine Information System</td>
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<td>MPA</td>
<td>Marine Protected Area</td>
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<td>MSP</td>
<td>Maritime Spatial Planning</td>
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<td>NFP</td>
<td>National Focal Point</td>
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<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<td>OG</td>
<td>Official Gazette</td>
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<tr>
<td>PAP/RAC</td>
<td>Priority Actions Programme/Regional Activity Centre</td>
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<tr>
<td>PRC</td>
<td>Policy Research Corporation</td>
</tr>
<tr>
<td>REMPEC</td>
<td>Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea</td>
</tr>
<tr>
<td>SCI</td>
<td>Site of Community Importance</td>
</tr>
<tr>
<td>SEA</td>
<td>Strategic Environmental Assessment</td>
</tr>
<tr>
<td>SGSS</td>
<td>Geologic Seismic and Soil Service of the Emilia Romagna Region</td>
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<tr>
<td>SI</td>
<td>Slovenia</td>
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<tr>
<td>SME</td>
<td>Small and Medium Enterprise</td>
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<tr>
<td>SWD</td>
<td>Staff Working Document</td>
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<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities, Threats</td>
</tr>
<tr>
<td>TCS</td>
<td>Technical Chart of the Sea</td>
</tr>
<tr>
<td>TPEA</td>
<td>Transboundary Planning in the European Atlantic</td>
</tr>
<tr>
<td>UNEP-MAP</td>
<td>United Nations Environmental Programme - Mediterranean Action Programme</td>
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<td>UNESCO</td>
<td>United Nations Education, Scientific and Cultural Organisation</td>
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<tr>
<td>WFD</td>
<td>Water Framework Directive</td>
</tr>
<tr>
<td>WP</td>
<td>Work Package</td>
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</table>
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Shape
Shaping an Holistic Approach to Protect the Adriatic Environment between coast and sea.

The three years Shape project (2011-2014) involved 13 partners from six Adriatic Sea countries and was co-funded by the IPA Adriatic Cross-border Cooperation Programme of the European Union.

It aimed at contributing to the development of a multilevel and cross-sector governance system, based on an holistic approach and integrated management of natural resources, risk prevention and conflicts resolution among uses and users of the Adriatic coast and sea.

Project activities promoted the application and the successful implementation of Integrated Coastal Zone Management and Maritime Spatial Planning in the Adriatic region.

The present handbook is intended as a methodological and practical guide aiming to support the future evolution of the MSP approach in the Adriatic Region. In this view it mainly addresses institutional officials, planners and experts on MSP issues, illustrating what they can do to further disseminate and concretely implement MSP in an Adriatic cross-border perspective.

www.shape-ipaproject.eu