Description of the methodology determined

C**omponent 1.2.2 develops a "Common methodology for analysis and spatial planning for maritime cross-border area"**.

This methodology is a framework for a broad spectrum of sectorial studies and cooperation between Romania and Bulgaria in the process of elaboration of a marine spatial plan for the Black Sea cross-border area.

The methodology aims at organizing the elaboration of a Marine Spatial Plan for the cross-border marine area Romania - Bulgaria, taking into account the aspects and processes with spatial relevance in this area.

The national authorities, in the two countries, can adopt the provisions formulated by the strategic framework of the spatial plan in specific marine/coastal strategic documents. This maritime spatial plan ensures the coordination of development locally with the need for an integrated macro-regional effort, through cross-border cooperation, in a sustainable strategic perspective.

The common strategic framework for sustainable development of the marine cross-border area Romania-Bulgaria must consider areas within the boundaries of territorial waters and phases in which the strategy should be applied in a unitary manner.

The methodology also aims to identify the stakeholders in Romania and Bulgaria which will play a significant role in support and /or consultancy the development of the marine spatial plan. Providing data and information in this endeavor involves collaboration between the ministries and other bodies of the two countries, holders of such information, in order to exclude the risk of possible errors. Also, local authorities in both countries should be attracted to draft the plan by participating in the consultation procedures.

This methodology establishes the specific principles and actions for addressing the problems of the maritime area, promoting partnerships and institutional relations and sets targets and priorities, geared towards projects with impact in the cross-border maritime area.

The common strategy of sustainable development of the cross-border maritime area Romania Bulgaria should answer the following imperatives:

- to illustrate the vision of an integrated cross-border maritime spatial development;
- to take into account the principles set out in the European documents:

  "EU Directive 89/2014 of the European Parliament and of the Council establishing a framework for maritime spatial planning", Guiding Principles for Sustainable Development of the European Continent" (Hanover 2000), Territorial Agenda of the European Union in 2020, Gödöllo 2011, Green Paper on Territorial Cohesion, Brussels, 2008;
- to harmonize national guidelines of the two countries involved in terms of policies for sustainable development of the maritime area;
- to identify the technical tools - areas of interest, stages of implementation, analysis indicators, detail the provisions of development / cooperation, etc. - accepted by both sides;
- to determine and evaluate the MSP best practices in the cross-border areas;

- to consider the interoperability of this plan with other types of plans from national spatial planning system, to make the action plan to be in accordance with each country-specific laws;
- to target also institutional aspects, from the identification of the central bodies acting as support/consultancy/agreement in the plan development, down to identify the most suitable institutional framework. This process of horizontal and vertical cooperation must be comparable in the two countries, to achieve an optimal overall effect;
- to put particular emphasis on the environmental, economic, transport networks and those relating to water management, particularly in view of cross-border effects.

Through the comprehensive nature of its approach, the methodology highlights some of the problems of the spatial planning system in the two countries.
The factors that influence the spatial planning systems in both countries can be classified into:

Regulatory and administrative factors
- constitutional and administrative traditions
- nature of the laws system
- the place of power in the planning system

Factors related to the planning system
- purpose of the system
- extent and nature of national and regional planning
- maturity and completeness of the system

Factors related to the implementation system
- the relative roles of the public and private sectors in implementing the plan
- distance between objectives and expressed results

The common methodology will highlight the shared characteristics that currently exist in the legal and on administrative systems, through a joint effort involving the completion of the planning process and plan implementation.

The spatial planning legislation of the two countries was harmonized as a result of EU requirements by adopting laws on planning and urbanism in 2001. They set the same levels of spatial planning in the two countries, and the same procedures for approval and approving the plans.

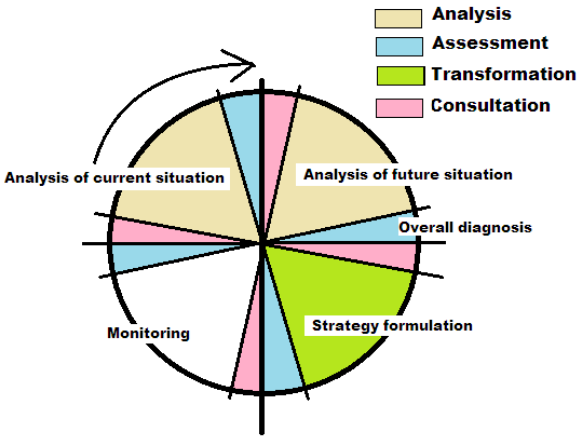
Each planning process is sustained by the interaction of two parties, the stakeholders and the technical experts, which negotiate their views and accept each other's positions, in order to achieve an acceptable final result: the plan strategy. These two parties, involved in the process, constitute the planning specialists and implementation authorities, both of them being equally important.

The methodology is structured by a succession of analyses done by technical experts and stakeholders consultations, concluded with common decisions on the continuation of the next phases of the planning process.
The stakeholders involvement in the planning process is conducted mostly through consultative methods, the technical experts are using technical and scientific procedures to reach strategic decisions.

The methodology for spatial analysis and planning of the maritime cross-border area include **phases, tasks and methodological steps**.

As a whole, the spatial planning process is developed in **four major phases**: **current situation analysis, future evolutions analysis, strategy formulation and setting the**

monitoring framework, in a succession of generic activities (analysis, assessment, transformation and consultation).



For a better understanding of each task, in the following will be explained in detail each methodological step.

Phase I: Current situation analysis of the Romania and Bulgaria maritime and coastal areas

Task 1: Introduction to specific problems of the study

This task is conceived to design the planning process and to identify the necessary resources and results for the plan elaboration. The resources, consisting generally in data sets, strategic documents, studies and maps, are relevant information for the plan area. The planning resources must be consistent with the designed tasks and activities of the plan. For example, the spatial structure analysis must be developed by means of data characterizing the spatial aspects of the marine area (surfaces of the specific zones, concentrations, traffic on routes) and with coastal areas.

1.1. The planning cycle is structured in a succession of typical activities, present in every planning process: analyses, assessments, transformations and consultations. The analyses are exploration activities which aim at differentiating and measuring the relevant processes of the marine space in connection with those present in the coastal areas. Assessment activities are intended to narrow the multitude of data used in the decision process, so that the plan will produce the most efficient and significant proposals for the area considered. Transformation activities follow to produce changes in the spatial structure, in order to obtain the benefits pursued by the plan goals.
The consultation activities are the result of the necessity to communicate, as much as possible, with those influenced by the spatial plan or influencing its implementation. The stakeholders' consultations are equally important as the data processing by desk studies, as it provides insights in specific domains, information on group interests and commitments to achieve the plan objectives.

Being aware of the problems or conflicts that triggered the planning process and need to be tackled by it, MSP will keep the focus on the planning cycle throughout the process. Otherwise one may risk losing sight of why to be engaged in the process in the first place. Doing this is also the first step toward selecting goals and objectives for MSP.

1.2. A specific problem of the study is the setting of the geographical delimitation of the study area. Generally speaking **the plan area consists of two adjacent areas**: the marine area (**management area**) and the coastal area (**area of the sources of influence**).

1.3. Throughout this task there will be carried out the review of other spatial development documents, whose provisions have relevant effects on the maritime cross-border area. These documents could be: spatial plans of the coastal area and of the administrative units adjacent to the seashore, sectorial plans and programs for marine and coastal domains, European Commission documents related to the marine spatial planning.
At this stage a study of the **relevant legislation and regulations** related to the marine and coastal cross-border area must be carried out. This information is relevant for the features intended to be realized on the legal basis, in the marine and coastal areas of the two countries. The existing sectorial development strategies and spatial plans are also relevant for the intentions of the authorities in the cross-border coastal area.

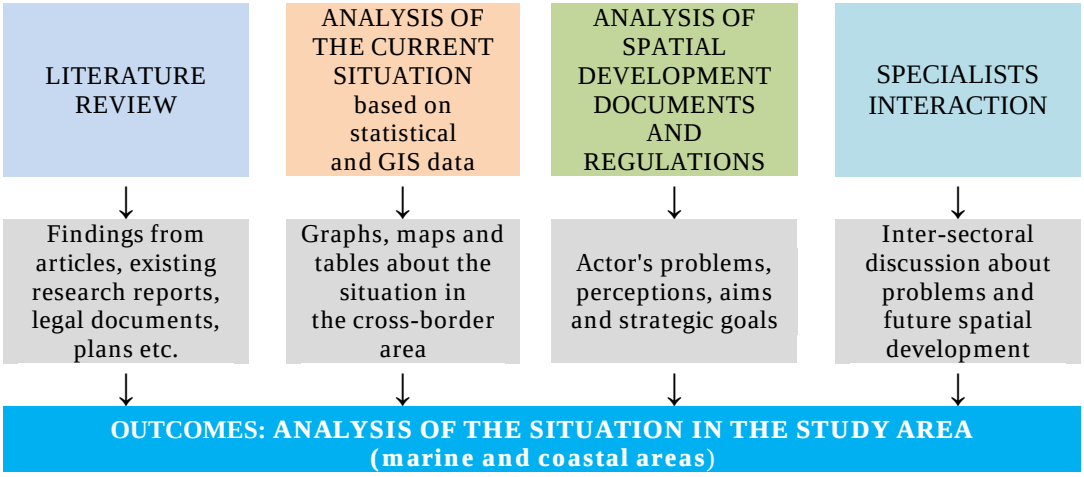
1.4. The study of **similar cases** lead to the identification of the most suitable and promising methodological steps for planning and implementation; as well as key principles such as sustainable development of marine areas, ecosystem integrity, stakeholders' participation or cross-border planning coherence, present in other countries' planning documents. By examining existing planning initiatives the most relevant good practices could be identified and then analyzed, with focus on the most relevant procedures for carrying out the cross-border maritime spatial planning in the Black Sea region.

1.5. Throughout this step, a large amount of **statistical and descriptive data** must be identified (in both countries and in the same period) in order to analyze the evolutions in time of the factors influencing the coastal and marine processes.

The criteria to select them are the following:

- Include indicators covering the main priority issues of the marine and coastal areas (e.g. urban sprawl, sea and land use, and marine and coastal habitats)
- Include the indicators for the ecological objectives related to marine and coastal zone
- Include the four main economic indicators (i.e. those considered by economic experts as minimum requirement to describe a sea and coastal economy).

1.6. At this stage, the lists of data and indicators, identified in both countries, will be confronted in order to assure the studies consistency throughout the cross-border area. The indicators must correspond in respect to the space level to which they relate (basic administrative units, specific functional areas, concentrations of resources, etc.) and to the time series (same years of collecting).
The research methods and their outcomes are synthetically presented in the illustration below.



Task 2: Current situation analysis through detailed studies (ex-post analysis) of the maritime and coastal area is developed through three steps:

a) review of the main spatial structures related to the analysis and planning of the marine area;

b) review of existing processes (natural and anthropogenic) in order to measure the progress towards sustainable development in marine zones;

c) assessment of the above-mentioned elements with **selected indicators** (see annex 1 of the methodology) against the needs of relevant domains and of the policy instruments (EU Marine Strategy Framework Directive), EU policies related to the marine and maritime environment (habitat and bird directives, floods directive, bathing water directive, water framework directive, marine strategy framework directive, common fisheries policy, the integrated maritime policy, etc.);

The main domains involved in spatial planning are dealt with respect to: the **spatial** aspects (the spatial footprint) and the **temporal** aspects (processes dynamic), like, for example, demographic, natural and economic processes. Processes and spatial structure are closely related: each development in time needs a place in space.

Spatial planning aims at a more efficient **spatial** configuration of the processes present in the studied area, in order to achieve economic and environmental effects. Therefore **space is the main resource** for achieving economic and ecological benefits as a result of an improved spatial structure.

2.1 Analysis of the spatial structure of the plan area

The spatial structure can be understood as a geometric arrangement related to human uses and biotopes, characterized by shape, surface, density, subdivisions etc. More broadly spatial structure acquires meanings as capacity, potential and capability.

The analyzed processes are natural and anthropogenic; the Black Sea marine areas are dominated by natural processes, coastal areas are mainly dedicated to human activities, which in time tend to take possession of the marine space.

2.1.1. The environment. The natural environment can be a support or a hindrance for the development of human or wild life communities, consequently, the plan must take into account and analyze initially the **ecological processes** and their spatial structure. The natural environment analyze will take into consideration the following issues that support and influence the ecosystems:

Ecologically and biologically significant areas are marine and coastal surfaces that include habitats with important ecosystems or functions that serve the ecosystems and/or because of their physical properties. Ecologically and biologically significant areas can include one or more habitats, each having its own size, diversity and heterogeneity of native and non-indigenous species.

General factors that influence the ecosystems:

- *Climate*
- *Geographical and physical conditions of the marine area*
- *Geographical and physical conditions of the coast*

Natural resources exploited by anthropogenic processes

- *Marine living resources*
- *Marine non-living resources*

Natural and anthropic damaging processes

- *Quality of environmental features*

- *Natural risks*
- *Technological risks*

Pressures on marine environment

- *Pressures on biodiversity*
- *Pressures by touristic and recreational activities*

The main purpose of environment analysis is to reveal the issues or the soundness of the marine and coastal processes (past dynamics and trends) in relation to their associated spatial aspects (habitats).

The soundness of the natural elements is revealed by analyzing the quality of habitats' features (physical properties, biological significance) concomitant with the evaluation of areas susceptible to degradation and risks (natural and technological risks).

Great importance in this endeavor must be given to the **natural environment protection areas** (marine and coastal), which must be delimited and characterized, in order to determine protection levels and management guidelines. The evaluation, distribution and evolution trends of the natural environment protection areas will be done on the following topics:

- *Biodiversity and habitats*
- *Protected natural areas*

2.1.2. A major domain for analysis, dissimilar to the natural environment, is the **built environment**, which includes the human settlements and the technical infrastructures networks. The development of the coastal settlement network is closely related to the marine space through specific activities (transport, fishing, tourism, and recreation, etc.), as well as resource acquisition, climate change and pollution. The settlement network can be evaluated through physical features as built up area, concentration of dwellings, social and economic facilities related to or influencing the sea, which can be grouped as follows:

- *Coastal settlements affecting the marine space*
- *Urban development affecting the coastal habitats*
- *Cultural heritage affecting the marine areas*

The technical infrastructures networks are part of the built environment that includes routes and stations, serving the settlements, these facilities being characterized by the flow of resources they can transit through (pipeline capacity, railroad traffic, stations and ports activity, etc.).

The influences of technical infrastructures on marine environment are significant through their effects of discharges and storage (intentional or accidental) of fluids and solids in the marine and coastal areas.

The technical infrastructures networks, analyzed in the plan include the following domains:

Transport infrastructure

- *Ports infrastructures*
- *Coastal transport infrastructures*

Water management works

- *Watershed management*
- *Water supply and sewage networks*

Energy generation and transport

- *Power production*
- *Renewable energy resources*

Exploitation/transport of crude oil and natural gas and **petroleum products**

Thermal energy distribution

Telecommunications

Waste management

- *Waste generation and storage*
- *Waste processing*

Technical infrastructures are elements of the built environment that enables mobility of resources between certain areas. Therefore analysis of technical infrastructures should cover primarily the flow of resources in relation to their capabilities. Secondly it is necessary to determine their influence on the marine environment, actual or potential.

2.2. The analysis of the current socio-demographic situation provides a detailed assessment of processes with a medium sized spatial footprint, compared to the slow evolving processes. Human communities take up little space by means of built-up areas for housing and facilities. However, socio-demographic processes have a significant importance within the spatial planning, due to the intensive pressure that they produce on the sea.

2.2.1. Characteristics of the **population and its demographic structures.** The demographic analysis reveals the main features of the population, namely: demographic growth, communities' structure (by age groups, by gender,), birth rate, mortality rate, and migration. Communities may also be defined in terms of collective interests, attitudes, traditional knowledge, such as those engaged in specific types of sea use activities.
The specific aim of a demographic analysis is to estimate the future size and structure of population and households. This information is useful for policy making regarding a wide range of issues, including the provision of housing, community facilities (education, health, retail), and utilities, as well as traffic and communications management, to address tourism and recreational needs, and to improve the urban life quality.

2.2.2. The structure and evolution of **human resources.** The assessment of population structure and evolution, coupled with human wellbeing evaluation, also takes into consideration access to sustainable jobs, but also the working population's capacity to perform economic activities and earn adequate revenues.
The study evaluates the employment / unemployment features of labor force by sectors and economic activities, highlighting the connections of human wellbeing to coastal and marine spatial development. Moreover, an assessment of employment / unemployment concentrations in **activity poles** is also important in order to determine future development trends and its effects on marine areas.
The study of local culture can also be useful in order to determine traditions, behaviors, values and beliefs that they agree in order to accomplish the social well-being.

2.3. The evaluation of the economic processes provides an assessment of local economic units and employment trends and the implications of their development for the maritime and coastal space. The analyses of economic environment related to the marine space will cover the following topic:

2.3.1. Macroeconomic context and the economic profile of the cross-border area, describing the economic profile and performances, highlighting the main economic structures affecting the marine areas, the capacities of ports and other important marine/coastal activities.

2.3.2. Economic analysis by sector will refer to the capacities and the results of human activities affecting the marine and coastal space.

- *The primary sector: fisheries and aquaculture, agriculture, forestry*
- *Secondary sector: industry and construction*
- *Tertiary sector: transport, trade/commerce, services and tourism*

Economic processes are the most intensive and fast-reacting both in terrestrial and in marine areas, especially those related to the industry and services sectors. Commercial and industrial processes are strongly influenced by market and technological changes, resulting in changes of employed personnel or in finding new locations for enterprises and businesses.
On the other hand, industrial and service activities cover the most reduced surface areas, (compared to processes described in paragraphs 2.1.1 and 2.1.2) while employing the largest number of the work force.

The economic activities influence space occupation, the activities having intensive and densely equipped surfaces, fall into the following categories:

- areas for real estate development on shore (housing, tourism)
- areas for port activities, industry and storage (sea related)
- areas for infrastructure (routes with protection corridors, stations, ports, renewable energy exploitation) etc.
- marine areas for exploitation of minerals, oil and gas (extraction platforms).

The evaluation of the intensity and diversity of economic activities is supported by the findings of various surveys and studies such as the macroeconomic context and the economic profile of the coastal area, economic analysis by sector (agriculture, forestry, fisheries, industry and construction, services and tourism).
The intensity of economic processes is measured by their results, in each group of activities (dynamics of the turnover, direct investment, gross value added) and by employment.

Employment dynamics, related to the structure and composition of the cross-border labour market, has changed considerably over the years. The study of economic activities provides an input for the employment levels projections for the next years, completed in another stage of the planning process.

2.4. One of the most important tools in spatial planning is **zoning,** through which is made an evaluation of marine and coastal usage of space. Zoning takes into consideration dimensional characteristics of processes in terms of **surfaces and density of resources**. Taking into account the elements like resource stock, equipment, or intensity of exploitation, **zoning** of coastal and marine areas (sea use plan) differentiate the following categories of zones:

a) - zones with economic extensive use and sparsely equipped:

- areas for marine fishing, fish farming
- land for agriculture, mining areas, areas for seaweed algaculture
- forestry land
- recreational areas
- wind farms on land and off-shore

b) - zones with intensive economic use and medium sized surfaces:

- ports, industry and storage on coast
- anchorage areas
- mussels farming
- built up areas
- mineral extraction areas

c) – zones excluded from economic use:

- not exploited natural resources areas (marine and coastal);
- protected natural areas (habitats)
- wetlands with environmental potential (habitats connectivity);
- open spaces (land, sea) without economic importance or in terms of biodiversity

- military training areas

The indicator which best characterizes land use is density, which measures the intensity of human or natural processes in these areas by the amount of natural resources or anthropogenic assets existing in these areas.

Types of uses of marine areas (examples):

Commercial Fishing with:
- nets
- hooks / rods
- cages / fish traps
- trawling / fishing dredges
- seiners
- beach seines
- gillnets
- offshore aquaculture / mariculture
- oyster traps

Recreational Fishing:
- hooks / rods
- cages / traps
- seafood baits
- harpoons

Aquaculture
- fisheries
- mussels farming

Recreation:
- sailing
- rowing
- nautical motor vehicles
- scuba diving / snorkeling
- watching marine life

Shipping:
- cargo ships
- tankers and liquefied natural gas
- cruise ships
- ferries
- port operations
- port dredging
- clearing out dredged material
- off-shore airports

Industrial operating offshore installations:
- LNG terminal
- operations involving offshore oil and gas
- offshore processing of oil and gas
- sand and gravel mining

Exploitation of renewable energy at sea:
- wind farms
- wave plants
- turbine parks
- carbon capture and storage sites

Areas for military operations
- offshore military areas
- inland military areas

Strictly protected marine reserves

Multiple use marine parks

Scientific research

Preservation of cultural and historical sites

Cables, pipelines, communication lines:
- natural gas transportation pipelines
- oil transportation pipelines
- communication cables and electricity transmissions

Harvesting seaweed:
- algae for industrial uses
- algae for fuel or fertilizers

Following the analyses of the zoning actual situation, a spatial structure will result which highlight the relations between marine and coastal areas and/or between marine areas in cross-border context.

2.5. The analysis of the **supra-territorial context** is aiming at identifying the influences coming from a larger territory than the strictly delimited cross border area of the present plan. The larger territory considered for this analysis has a national, international or (inter-) continental scale.

In this case, it is important to identify the most important centers (metropolises, development poles, port-cities) and the transport corridors related to them, which affect the cross-border area, with particular emphasis on the marine area.

Specific issues to be addressed by this methodological step are the synergistic or disturbing effects achieved through influences and relations in a larger area, with respect to:

- Interchanges between countries bordering the Black Sea basin;
- Environmental issues occurred between neighboring countries;
- Common actions for natural areas protection;
- Major infrastructure development between countries;
- Co-management of water resources, energy and urban waste;
- Protection of the marine space and natural coastal areas (beaches, cliffs, forests, wetlands, nature reserves, landscape protection areas);
- Ensuring a better intercity public transportation and connections inside and outside the project area;
- Development of economic activities, including inside free zones, industrial parks, etc.
- Modernization of border crossing points.

The supra-territorial context provides an input for the diagnosis of the project area by revealing the major threats for cross-border space.
The analyses (tasks 2.1 to 2.4) of the present condition and evolutions of the processes affecting the plan area must be illustrated on maps in order reveal the spatial features - detailed areas and positions - and the relations between different areas and activities.

Task 3: **Assessment of the previous evolutions** and selection of main problems, strengths and opportunities (sectorial diagnosis)

The plan cycle contains at least three stages of results assessment for the preceding elaboration stages: the sectorial diagnosis (previous dynamics evaluation), overall diagnosis (future developments assessment) and strategy assessment (evaluation of the possible courses of action).

3.1 Achieving the **sectorial diagnosis** and establishing priorities represent a methodological step aiming at producing an inventory and a hierarchy of problems and strengths highlighted by the former steps of analysis.
The sectorial diagnosis designates the disparities and priorities in the coastal and maritime area, structuring them according to their significance.
A correct and accurate problem formulation is the first step in the sectorial diagnosis.

3.2 In this respect, the SWOT analysis is a useful tool for developing this methodological step, preparing the information for the decisions realized in the strategy phase of the project. The SWOT analysis will cover each domain analyzed in the previous steps, highlighting their particularities in order to reflect the relative priorities and importance.

3.3 The problem tree analysis is another major technique for planning, since it strongly influences the design of possible interventions. It is the basis and justification for the plan specific objectives formulation.

3.4 In order to establish an overall assessment of the problems and opportunities revealed by the analysis in the cross-border area, a comparison between the two countries must be done. Common problems are interesting from the point of view of impact they have in the cross-border marine area, according to their significance. Consequently, it is important to see them as collaboration issues in the future plans of each country's marine areas.

Task 4: **Stakeholders' consultation -** establishing institutional awareness on the problems and priorities to be addressed by the spatial plan.

Stakeholders are individuals, groups, or organizations that are (or will be) affected, involved or interested (positively or negatively) by MSP measures or actions in various ways.

It is important to determine from the beginning the responsibilities of each group of stakeholders towards different marine areas. The stakeholders' responsibility for the marine areas could be exclusive or shared with other stakeholders and it is one of the most important factors in plan implementation.

In the planning process it is important to determine whether the different groups of people perceive the problems in the same way; if not the problems should be reformulated or split.

Generally, there are **two major groups of participants in the planning process**: technical experts and stakeholders. Thereby, spatial planning can be seen as a technical process integrated in a political process.
Each group has different perceptions on the problems; technical experts perceive problems as a result of the specific analyses, while stakeholders see them according to their expertise and needs.

In this respect, it is important that all participants within the planning process get the chance to express the problems they experience. After discussion between stakeholders and explanations by the 'problem owner', all problems should be respected.

Stakeholders' involvement should consider three important questions: who should be involved? When should stakeholders be involved? How should stakeholders be involved?

4.1 Depending on their interests, their ways of perceiving problems and opportunities, concerning the MSP area and its resources, many different stakeholders can be consulted. Categories of criteria that can assist in distinguishing stakeholders' relevance for the MSP include: motivation, influence, official role, rights to the resources, legal liability.

4.2 The most important phases in which stakeholders' participation should be considered are at least:
- **Assessment of the previous evolutions**
Engaging stakeholders in the analysis of existing conditions can be rewarding, allowing the collection of information on a wide range of problems, opportunities and conflicts that take place in the management area. At this point a set of **goals and principles** can be established in relation with each group of stakeholders.
- **Overall diagnosis**
The larger a participation in the process of setting scenarios, goals and objectives, the greater the stakeholders' acceptance and legitimacy of the MSP plan is likely to be.
- **Strategy formulation** and adoption of the common **strategic framework** of the marine spatial plan.

4.3 There are many different **ways to involve** stakeholders, ranging from 'communication' with no real participation, to 'negotiation', where decision-making power is shared among stakeholders. At this stage, possible ways to empower stakeholders include:
- Distribution of information in order to raise awareness of the possibility of participating in MSP efforts;
- Organizing meetings of certain stakeholder groups to support understanding the MSP and its effects;
- Collection of necessary spatial data related to their activities;
- Education initiatives to develop and improve problem analysis and awareness;
- Assistance in developing a position for the stakeholders by helping to set problems.

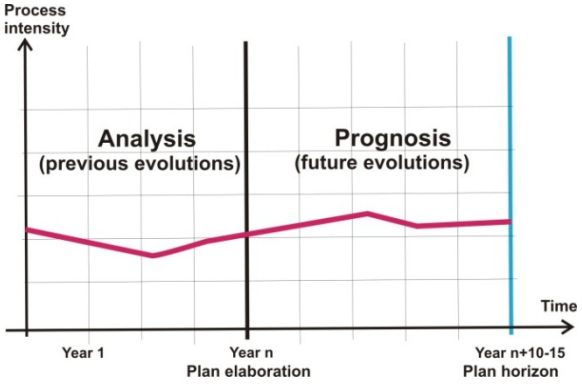
4.4 A core group of stakeholders should be engaged in the analysis and approval of the action plan and its consequences of the different alternatives on areas of their interest.

Stakeholders' involvement must be adapted to the degree of importance and to the role played in the plan area, in order to obtain the right support in the phases of strategy formulation and implementation.
The Problem Tree Analysis is a convenient consultative method, suited for use in all stages of the planning process (problems analysis, goals setting and objectives formulation), in which all parties involved identify and analyze the needs and future actions together.

Phase II. Analysis of the future evolutions

Task 1: Prospective analysis - study of **future developments** in key domains related to maritime space (ex-ante analysis)

MSP is a future-oriented activity. Its purpose is to help envision and create a desirable future of the maritime area and enable a proactive decision-making in the short run to move toward what is desired. Consequently, planning should not be limited to defining and analyzing only existing conditions and maintaining the status quo, but should reveal possible alternative futures of how the cross border area could look like in 15-20 years.
The prospective analysis provides forecasts regarding the evolution of the most important processes present in the maritime cross-border area, in order to make strategic decisions regarding the future situation of the area. The prospective analysis results will be used as a basis in the development of the plan vision, which must offer a general image of the future state of the marine area. The relation between analysis of the previous evolutions and prognosis is showed in the diagram below.



In order to show the most important upcoming changes of the spatial structures, the forecast must start from the trends of the main processes, observed in the current situation analysis phase. These processes forecasts will lead to changes in the spatial structure of the marine and coastal areas, due to other sea areas and land demands from human activities and ecological requirements.

1.1. The projections of population assume that future events will be similar to past events. The hypotheses taken in consideration are based on an understanding of the cross-border area demographic situation with respect to mortality events, reproductive behavior and migration, as outlined in the analysis chapter (Task 2, step 2.2).
Two sets of population projections were produced for the study, the forecasts for the years 2025 and 2050. The projections of population could be developed in three alternative projections: the baseline, optimistic and pessimistic variants.
The baseline variants are usually used in the further steps of planning, where the other two variants are considered less likely to occur.

1.2. The forecast of economic activities provides projections of employment and economic results trends and the implications for employment planning in the coastal and marine areas.

The forecasts are supported by the findings of various surveys and studies (Task 2, step 2.3) and by the results of the projections of population.
These forecasts will be produced at an aggregate level and broken down by type of activity. The goal of this step is to determine the amount of jobs in correlation with the development of economic activities (number of economic units, turnover, added value) and their location. The future evolutions of the areas allocated to fishing, transport, dwellings, industry and warehousing, recreational and tourism activities, will impact on natural areas, off- and on-shore, imposing adequate strategic measures.

1.3. The transport forecasting is based on a model of travel for the cross-border area, on the projections of population and employment, and data collected from other traffic surveys. The transport model itself will eventually be used for testing planning scenarios to establish the new directions of development of transport activities and routes.

1.4. The future evolutions, provided by the previous forecasts, will be represented on maps elaborated to visualize future spatial structure of the cross border area; they should suggestively illustrate patterns of activities, trends and directions, expressed by adequate graphics.

Task 2: **Overall diagnosis**
The overall diagnosis aims at creating, assessing and selecting the strategic development scenarios, in order to guide the plan strategy towards some future desired situations.
2.1 A strategic growth scenario is essentially a future-oriented strategy for accommodating the environment wellbeing in relation with economy and household growth, anticipated over a period of 10 - 15 years, in the context of the MSP vision and goals. The objective of creating and testing alternative scenarios is to:

- ensure that all genuine alternatives for sea areas demand, shown by the studies and stakeholders opinions, are considered;
- ensure that impacts of these alternatives are examined prior to making choices as to the most appropriate strategic direction for the MSP.

The starting points for developing strategic growth scenarios are:

- the **principles and goals** that have been formulated by stakeholders in collaboration with planers;
- the levels of growth that are envisaged in the principal sectors that drive sea/land use change, namely, ecosystems, population and economy, as indicated in the forecasts section.

The implications of the strategic growth scenarios are then assessed, and a preferred scenario is selected, on the basis of a technical evaluation that includes:

- an environmental assessment showing the influences and threats on natural areas;
- an assessment making use of a set of technical criteria, in order to arrive at a preferred growth scenario to guide the plan. The criteria covered the three pillars of sustainable development: environment, society and economy, although most of the criteria relate to environmental concerns.

The construction of strategic development scenarios will result in three proposals:

1 – **Current tendencies** (scenario of zero intervention)
2 – **Accelerated development**
3 – **Average or limited development**

The **current tendencies** scenario allows the examination of the implications for retaining current trends and other plans strategic measures, acting in the coastal area and influencing the marine space.

The **accelerated development scenario** encourages economic growth; the aim of this scenario is thus to examine the implications of promoting accelerated activities and job growth in the MSP.
In terms of the location of employment generating social and economic facilities, this scenario also supports a variegated multi-centered approach, as in the third scenario, however since more growth is envisaged there will be more employment accommodated in the new employment nodes.

The strategic direction taken in the **scenario of average or limited development** therefore combines strict restraint on economic development with the accommodation of the environment necessities and employment requirements in medium sized or limited areas.

2.2 The final aim of the overall diagnosis is to find the **optimal scenario** for the evolution of the spatial system as a whole, leading to the desired state (determined by the **strategic vision of development**) achieved as a result of the plan implementation. This is accomplished by reaching equilibrium between production and consumption, between the demand of resources and their regeneration, between supply and demand etc., situations resulting from a rational management of resources according to strategic policies stipulated by the plan.

The geographical representations of the three strategic scenarios are illustrated on maps which indicate the location and amount of areas dedicated to ecosystems and the employment growth, by basic administrative units, as well as the changes occurred in other specific areas (marine and coastal).

Task 3: Stakeholders' consultation and agreements on strategic goals and priorities of the plan.
In this stage, the stakeholders should be consulted with regard to their intentions and future goals for the next 10 - 20 years.
3.1 The stakeholders are informed about the results of the overall diagnosis and the preferred (optimal) strategic scenario. Appropriate consultation documents will be prepared in order to explain the development scenarios and determine the stakeholders' responses regarding their specific goals for the marine area.

3.2. Stakeholders should recognize that the marine management area typically is affected by human activities: upstream, from the marine management area, but within the drainage area of the adjacent coastal area, (e.g. agriculture); and downstream, from the marine management area, e.g. in the open sea. Pressures on the marine resources may be greater from activities outside the marine area than from activities inside it.
3.3 Stakeholders' goals and interests in the marine area must be known and comparatively analyzed in order to establish a set of strategic goals, as basic elements for strategic scenarios development.
Main interests and goals of the stakeholders involved in the marine area activities or affecting the area could also be determined from sectorial strategies and plans, valid for the spatial plan period.
3.4. By confronting the findings of overall diagnosis, elaborated by the planning team, with the stakeholders' goals and priorities, an optimal strategic scenario will be chosen. This scenario(s) will include, as much as possible, the opinions of all significant participants in the planning process.

Phase III. Strategy formulation - development of component 1.2.3: Common Strategic Framework for MSP in Romania and Bulgaria)

Task 1: Formulation of the common strategic framework (vision, principles and goals)

1.1. The formulation of spatial vision

The spatial vision must reflect the set of strategic goals established in the former stages within stakeholders' consultation process.

The vision is based on an expanded interdisciplinary and participatory process. This process leads to integrate all stakeholders of the region in order to reach a broad base of consensus, built on shared values. This would achieve consensus on the desired objectives expressed by that vision. Stakeholders' goals play an important role in maritime spatial planning and their cooperation is critical to success, both in the sense of property and customers insurance, or access to significant sources of local knowledge.

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 (Ramieri E. et al., 2014.).

1.2. Correlation between principles and goals

In this stage one must identify and establish the principles which will guide the intended strategic actions during the plan implementation period. The principles must be correlated with the plan goals in order to set the strategic framework on a sound basis. The principles have to be maintained as long as possible during the plan implementation, as guidelines for monitoring and adapting the plan actions.

Examples of MSP principles:

The ecosystem integrity principle: This essential principle implies a primary focus on maintaining ecosystem structure and functioning within a MSP area. It includes the recognition that ecosystems are dynamic, changing and sometimes poorly understood (therefore requiring precautionary decision-making). Under the principle on the ecosystem approach the focus is on: good status of the Black Sea ecosystem, (including impact of human activities) related to the concept of ecosystem services and seen as contribution to the goals of EU Marine Strategy Framework Directive (MSFD), as well as on protection and enhancement of marine environment via the MSP. From this general principle could be developed three specific principles:

1. Maintaining or restoring indigenous species diversity, composition, and functional redundancy
2. Maintaining connectivity across habitats
3. Maintaining ecological attributes

The integration principle: Working in sectorial and institutional compartments or "silos" is often an efficient way to manage, but it creates significant costs of non-coordination that should be identified and addressed. MSP can play a critical role in facilitating coherence and integration. Integration among sectors enables to go beyond sector policies, plans and legal instruments and provides win-to-win solutions for more than a single use of the sea. Integration among levels of government can help create complementary and mutually reinforcing decisions and actions.

Also, integration among the environmental, social, economic and governance dimensions is required to elaborate solutions able to properly respond to real sustainability objectives (Ramieri et al., 2014)

The long term perspective principle: The principle of long term perspective stresses the need of such perspective in relation to goals and effects. Plans should be based on long term visions of a comprehensive nature. This principle also protects planning provisions being spoiled by the short term benefits. To asses compliance of the plans with this principle one should ask for existence of an underlying comprehensive vision for maritime space development, vertical and horizontal coordination of the given plan with other policies, planning horizon and

existence of alternative scenarios of the future use of the sea area. The way and extent of taking into consideration long term phenomena such as climate change or technological progress should be screened as well.

The public trust principle: This principle (or doctrine) implies that marine resources, including marine space, belong to the people and are held in trust by the government for its people and future generations. Marine space should be managed as a "commons", i.e., as part of the public domain, not owned exclusively or to be benefited by any one group or private interest.

The participation and transparency principle: This principle suggests that the processes used to make decisions should be easily understood by the public, allow citizens to see how decisions are made, how resources have been allocated, and how decisions have been reached that affect their lives.
The principle stresses the need to secure participation of all relevant authorities and stakeholders as well as general public in maritime spatial planning initiatives at the earliest possible stage.

The precautionary principle: This principle suggests that if a decision could cause severe or irreversible harm to society or the environment, in the absence of a scientific consensus that harm would not succeed, the burden of proof falls on those who advocate taking the action.
To asses compliance of plans with this principle there will be need the Strategic Environmental Assessment (SEA), as well as the identification of adverse effects to the natural environment, culture, society and economy and relevant precautionary measures addressing those effects.

The polluter-pays principle: The costs of pollution or damage to the environment should be paid by the responsible party.

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

High quality data and information basis principle: This principle recalls that MSP should be based on the best available and up to date comprehensive information of high quality that to the largest possible extent should be shared by all. Presented quantified information should cover historical baselines, present status as well as future projections of both environmental aspects and human activities. To assess whether a given plan meets those requirements it is needed to check the scope, quality, reliability of collected data, methods of data analyzing and processing (use of "decision support tools") and existence of information gaps and data constraints.

Cross-border cooperation principle: 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 common vision; definition of shared principles, objectives and targets; cross-sectorial planning), implementation (including shared monitoring, common indicators and evaluation).

Continuous planning principle: this principle represents that planning is a continuous process that will need to adapt to changing conditions and new knowledge. Therefore, monitoring and evaluation should form an integral part of the planning process. Public participation is essential for their success. To examine the compliance of a given plan with this principle it is needed to ask whether legal responsibility for preparing maritime spatial

plans has been clearly assigned, what are the legal provisions for monitoring and assessment of the results of the plan including methodology, indicators (targets), and what is the role of stakeholders (also international ones) in this process.

Examples of MSP goals might include:

- Conserve or protect marine resources;
- Conserve ecological structure - at all levels of biological organization - to maintain biodiversity and natural resilience of the marine area;
- Protect ecologically valuable areas;
- Restore degraded areas;
- Ensure sustainability of economic uses of marine space;
- Promote appropriate uses of marine space;
- Reduce and resolve conflicts among current and future human activities;
- Reduce and resolve conflicts between current and future human activities and nature;
- Ensure economic return to the public from the use of maritime space.

Task 2: Formulation of strategic objectives and action plan in accordance with the goals agreed.

2.1. The formulation of specific objectives is performed for each sectorial area considered. The main aim of the specific objectives is the optimization of existing and future (as defined by the vision and the selected scenario) ecosystems, human uses, in a way that conflicts and impacts are minimized and synergic opportunities are capitalized. At this stage of the planning process, strategic objectives and scenario must be corroborated and translated into concrete and quantitative ends (e.g. % of the marine area to be protected, maritime uses to be increased or limited, connectivity to be strengthened or even established, etc.).
The maritime spatial plan proposals mainly consist of two parts: (1) graphic documents - maps showing zoning of areas for specific uses and objectives, (2) text documents - descriptions of strategies and management actions, as well as monitoring indications for the identified spatial structure parts.
Five main types of objectives can be identified in relation with marine zoning:
- objectives for **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, beach areas, etc.). Other uses are allowed only if not conflicting with the priority one.
- objectives for **reserved areas**; where a use, or group of uses, receives special attention, while it has not absolute priority as in the previous case.
- objectives for **no go areas for all uses**; where all human uses are prohibited.
- objectives for **no go areas for a certain use**; where a specific use is prohibited as incompatible with all the other uses.
- objectives for **open use** areas; where no use has an absolute or conditional priority and all uses are allowed.

2.2. Analyzing the objectives' consistency with other strategies and plans
The specific objectives must be consistent with the provisions of other strategies and plans applicable in the cross border area. These are generally spatial plans (national, regional, district, county and zonal plans) urban plans and sectorial plans for specific domains: fishing and aquaculture, ports operations, maritime transport, environment protection, etc.

2.3. Development of the action plan for MSP
Management actions are specific measures taken in order to achieve a specific objective; management actions should also identify the incentives (regulatory, economic, educational)

that will be used to implement the action and the institution or institutional arrangement that has the authority to use the incentive to implement the management action.
A management plan will have many actions (not all spatial and temporal) that will be applied to the important sectors of human activities, e.g., fisheries, marine transport, offshore renewable energy, minerals extraction, oil and gas extraction that use the resources of the marine area.

2.4. Assessment of the Common Strategic Framework for MSP
The assessment of the common strategic framework is focused on the description and evaluation of any substantial impacts on the marine environment that are likely to be caused by the implementation of the marine spatial plan, using the existing description and assessment of the marine environmental status as a basis. At the same time, measures are described by which any substantial impact on the marine environment was to be prevented, reduced, or compensated as best possible.
The Strategic Environmental Assessment (SEA) is a useful tool for identification and consideration of the possible negative impacts into environment and human health caused by the implementation of the marine plan, or other strategic document.
The goals of SEA are: 1) improving plan the way to minimize its potential negative environmental impact and to maximize positive impacts, and 2) ensuring that possible negative impacts that cannot be avoided are properly managed and offset during implementation of the plan. In general, the main benefits of SEA are the following:
- corrections of the plans at the early stages of planning process, which will result in much lower costs for implementation, than assessing each particular project at the implementation phase
- at the plan development stage, it is possible to consider more and wider alternatives, than later, during the implementation stage.

2.5 An assessment of common strategic framework for the cross-border area could be performed at this stage, in order to identify objectives that have significant synergic effects in implementation of the MSPs in the two countries. Common objectives present in the two countries plans contribute to the real character of cross-border spatial planning of the maritime area.

Task 3: Stakeholders' consultation - approval of the strategic objectives and action plan by the stakeholders involved **(setting the basis for the cooperation framework)**
Stakeholders should be consulted and engaged, when appropriate, in approving and improving the Common Strategic Framework for MSP.
3.1 Planners and interested actors should be involved in drafting the terms of reference for the evaluation, the selection of evaluators, providing the evaluators with information and guidance.

3.2 Planners will also proceed to a review of the assessed draft, preparing the final version of the Common Strategic Framework, including in the document the observations made by the stakeholders.

3.3 The final version of the Common Strategic Framework for the cross border maritime area will be approved by the stakeholders, published and disseminated.

Phase IV. Setting the monitoring framework

Task 1: Creation of a common spatial data base for marine areas in Romania and Bulgaria

1.1 The common spatial database for marine areas is meant to assist the maritime spatial planning in both countries and to help data sharing between authorities in the management of the cross-border maritime and coastal areas.
The spatial database, designed for the cross-border area, will include indicators that shall be used to draft the marine spatial plans, including data for all sectors. The data must be present in both countries at local level and in the same reference periods.

1.2 The spatial database should contain the four broad categories of analyze: environment, socio-demography, economy and built environment. The collection of data must be coordinated with the planning methodology in order to cover all the activities involved in elaboration and will serve the monitoring needs of the spatial maritime plans.

1.3 Being a spatial data base, special equipment (hardware and software) must be commissioned and operated in order to handle GIS formats. Both software and operation procedures must be similar in Romania and Bulgaria.

1.4 Spatial data must be represented on maps; therefore cartographic support will be developed in order to be used in both countries. The cartographic support should have the same technical properties in both countries.

1.5 In order to create a common spatial data base a number of experts in GIS should be appointed. The team structure and its technical capacity will enable it to deal with collecting and processing the established lists of indicators.

Task 2. Defining the indicators to be monitored and monitoring procedures

2.1 Each management action should have at least one indicator or set of indicators that will be used to measure and evaluate its performance over time.
At least three categories of monitoring indicators and assessment activities are relevant in monitoring procedures:
• monitoring the state of the **marine system**;
• monitoring **expected benefits** of the maritime spatial plan;
• monitoring the MSP implementation **process**.

2.2 Monitoring **procedures** of the spatial plan shall respond to the following key improvements of the cross-border marine areas:
• decreased impacts on the environment, habitats and species
• successfully resolved conflicts among maritime uses and between uses and (ecologically and environmentally) sensitive areas
• successfully approached spatial incompatibilities between marine and coastal areas
• fully investigated and capitalized possibilities of co-location of uses
• evenly distribution of benefits in the whole area of interest (i.e. the Adriatic Sea) ensuring equal opportunities for all countries and regions
• benefits delivered by the plan to all involved stakeholders
• socio-economic benefits triggered by the plan implementation

Task 3. Creation of a data sharing center supporting the cross-border maritime spatial planning activities
The data sharing center can play many different roles, and the information produced can be put to very different uses in order to:

- Demonstrate accountability in supporting maritime spatial planning processes;
- Convince using evidence from findings and the data base;
- Educate by reporting findings in order to help organizational learning;
- Assess and perceive what works, what does not, and why;
- Document recording and creating an institutional register;

• Involve by engaging stakeholders through a participatory process;
• Gain support demonstrating results to help gain support among stakeholders;
• Promote understanding the reporting results in order to enhance acceptance of projects, programs, and policies.

In conclusion, one must have in mind that the **spatial plan** is a strategic long-term instrument for most purposes, which covers a period of 10 -15 years. It is concerned with all aspects of social, economic physical and ecological configuration, but it is distinguished by the following characteristics:
1. It is basically **a coordinating plan**; it does not attempt an in-depth analysis of all sectors of life: this is essentially the job of the various administrations and other public agencies. Instead, the objective of the plan is to be comprehensive and to ensure that individual sectorial policies are as compatible as possible with those of other sectors.
2. It provides the **context for the subsequent more detailed plans**. As well as being strategic in an analytical sense, it is strategic in a physical sense. It covers the whole space of the cross-border area and, for the most part, is expressed in terms of areas, zones and districts rather than sites.
3. The spatial plan **does not seek to reverse trends**, but rather to divert them where this seems to be beneficial. Although many of its analyses and recommended policies are non-physical, its basic concern is with the sea areas - essentially what should be developed where, when and how.
4. It is not a plan for the **total restructuring** of the marine area's fabric and way of life: such a plan does not exist, and probably should not. Planning has been defined as “cooperation with the inevitable”.
5. It is essentially **an enabling plan**. The inclusion of some forecast or proposal does not mean that it will happen, particularly if applicable to the private sector. Rather the plan says “if and when this particular demand arises, this is where and how it should be accommodated”.
6. The spatial plan is **not a static instrument**. Changes in the various sectors of activity with which it deals will be monitored, and amendments to the spatial plan will be made when this seems appropriate.

Glossary

Adaptive planning
A dynamic planning process that recognizes the future cannot be predicted perfectly and planning and management strategies are modified frequently as better information becomes available.

Biodiversity
A term that refers to the sum of all living organisms within a given ecosystem.

Community
A social group of any size whose members reside in a specific area, share government and often have common cultural and historical heritage. A community may also be defined in terms of collective interests, attitudes, or sectors, such as those engaged in specific types of maritime use activities.

Culture
The way of life, customs, institutions, and achievements of a particular nation, people, or group including behaviours, beliefs, values and symbols that they accept, and that are passed along from one generation to the next.

Cumulative Impact
The impact on the environment which results from the incremental impact of an activity when added to other past, present, and reasonably foreseeable future activities. In the context of the MSP.

Conservation
The protection, maintenance, and rehabilitation of living marine resources, their habitats and supporting ecosystems.

Drivers
Drivers are typically human activities (e.g., oil and gas development, tourism) or result from human activities (e.g., climate change) that could potentially impact the environment or the social, cultural and economic well-being of communities.
Ecologically and biologically significant areas
Maritime areas that have been identified as ecologically or biologically significant because of the functions they serve in the ecosystem and/or because of their physical properties.

Ecosystem-based planning/management
The management of human activities so that ecosystems, their structure, function, composition, are maintained at appropriate temporal and spatial scales.

Flexibility
The implementation and monitoring efforts of many different authorities, organizations and interests are brought together and focused on a jointly defined set of issues and objectives. A suite of legislative and regulatory processes and voluntary measures are relied on and coordinated, including those affecting fisheries, aquaculture, environment, transportation, oil and gas, and sea use.

Goal
Worded statements that describe the desired end state with respect to a particular subject. Usually, goals are open ended in the sense that no time-frame is identified for their achievement. They are not normally expressed in quantitative terms. Goals typically reflect broad ideals, aspirations or benefits pertaining to specific environmental, economic or social issues.

Governance
Governance is about how government and other social organizations interact, how they relate to citizens, and how decisions are made in an increasingly complex world.

Inclusiveness
Coastal communities, and other persons and interests affected by marine resource or activity management, should have an opportunity to participate in the formulation and implementation of integrated management decisions, because the objective is achievement of common goals. In this way, all interested and affected parties guide decisions from definition and articulation of goals to planning, implementation and evaluation.

Indicator
Quantitative/qualitative statements or measured/observed parameters that can be used to describe existing situations and measure changes or trends over time.
Integrated maritime planning/management
A commitment to planning and managing human activities in a comprehensive manner, while considering all factors necessary for the conservation and sustainable use of marine resources and the shared value of maritime spaces.

Local knowledge
Local knowledge is current knowledge held by people within a community. It can be gained by any individual who has spent considerable time on the land or water observing nature and natural processes.

Non-indigenous species
Plant or animal species in reproducing, isolated populations outside of their historic range. These species are not necessarily capable of establishing viable populations or being invasive, and have been introduced by human activities (e.g., transport in ballast water).

Objectives
Response to identified issues by describing a desired future state of a particular issue. They are more specific and concrete than goals. Objectives should be measurable, either directly or indirectly, as a base for evaluating whether or not they are being achieved over time.

Precautionary approach
The precautionary approach identifies that the application of precaution is to be used as a cost-effective decision making tool to be used when there is a need for a decision, there exists a risk of serious or irreversible harm, and, there is a lack of full scientific certainty.

Problem tree
A management tool that creates a graphic representation of the potential impacts of human activities on valuable ecosystem resources including fish, marine mammals and habitats. Each branch or line from the problem to the stressors it causes to the ecosystem also represents an area where mitigation can often be applied to lessen or eliminate the stressor. Problem tree models allow for identification of the cumulative effects of several activities on one component of the ecosystem.

Sea use plan
The concept of sea use planning is similar to that of 'land use planning'. Detailed policies, agreements, memoranda of understanding, terms and conditions, guidelines and other tools may guide how each zone identified in a plan can be used and managed.

Shared Responsibility
The duty in shared responsibility recognizes that authorities, coastal communities, industries and other persons and bodies affected by or affecting marine resources have a duty and shared responsibility for supporting the sustainable development of marine resources.

Strategy
A plan of action for how to achieve long-term objectives.

Sustainable development
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Tradition
An inherited, established, or customary pattern of thought, action, or behavior (as a social custom).

Traditional knowledge
Traditional knowledge is the transfer of cultural, social and environmental information, both orally and written from one person to another – from generation to generation.

Therefore traditional knowledge is a combination of traditional environmental knowledge, traditional land use and traditional practices. It is a continuous process of information that is transformed and adapted to current knowledge.

Value
A social norm manifested as a result of history and culture. It is a shared understanding among people of what is good, desirable or just.

Vision Statement
Embodies the desired outcome of MSP. It provides the context for the development of all other objectives.

Description of the effectiveness of the applied methodology to develop MSP

This methodology establishes the specific principles and actions for addressing the problems of the maritime area, promoting partnerships and institutional relations and sets targets and priorities, geared towards projects with impact in the cross-border maritime area.

The common strategy of sustainable development of the cross-border maritime area Romania Bulgaria should answer the following imperatives:
• to illustrate the vision of an integrated cross-border maritime spatial development;
• to take into account the principles set out in the European documents:
"EU Directive 89/2014 of the European Parliament and of the Council establishing a framework for maritime spatial planning", Guiding Principles for Sustainable Development of the European Continent" (Hanover 2000), Territorial Agenda of the European Union in 2020, Gödöllo 2011, Green Paper on Territorial Cohesion, Brussels, 2008;
• to harmonize national guidelines of the two countries involved in terms of policies for sustainable development of the maritime area;
• to identify the technical tools - areas of interest, stages of implementation, analysis indicators, detail the provisions of development / cooperation, etc. - accepted by both sides;
• to determine and evaluate the MSP best practices in the cross-border areas;
• to consider the interoperability of this plan with other types of plans from national spatial planning system, to make the action plan to be in accordance with each country-specific laws;
• to target also institutional aspects, from the identification of the central bodies acting as support/consultancy/agreement in the plan development, down to identify the most suitable institutional framework. This process of horizontal and vertical cooperation must be comparable in the two countries, to achieve an optimal overall effect;
• to put particular emphasis on the environmental, economic, transport networks and those relating to water management, particularly in view of cross-border effects.

The methodology also aims to identify the stakeholders in Romania and Bulgaria which will play a significant role in support and /or consultancy the development of the marine spatial plan. Providing data and information in this endeavour involves collaboration between the ministries and other bodies of the two countries, holders of such information, in order to exclude the risk of possible errors. Also, local authorities in both countries should be attracted to draft the plan by participating in the consultation procedures.
The main objective of the project is to build on existing capacities and develop new and different approaches to support integrated policies for the marine areas of the Black Sea in ways that are consistent with and relevant to the implementation of the EU Marine Strategy Framework Directive.
In this context, the aim of Work Package 1 is to refine and further develop efficient and easy to use tools for making sustainability assessments and strategies in the maritime zone.
Within the project framework, the set of indicators necessary to develop **Phase I**, **task 2 - Current situation analysis -** is meant to provide indicators that should not only serve as a descriptive but also an analytical tool for understanding of the marine and coastal system, in a transnational approach. To achieve this, cross-linkages between indicators are needed, in order to:
- provide the partners responsible of the strategic framework policies with a simply and ready to use set of indicators;
- support the work of the data sharing centre;
- provide the common spatial database for maritime areas in Bulgaria and Romania with a set of indicators which could then be used implementation of relevant policy frameworks (e.g. EU Marine Strategy Framework Directive, EU Water Framework Directive).

- definition of new indicators where necessary, taking into account the needs for indicators in the maritime areas.

A spatial planning approach calls for indicators in order to assess maritime environment effects and to measure progress in implementation of the marine strategic framework. Initiating, monitoring or evaluating a marine process, requires a set of environmental, and socioeconomic indicators that should relate to the specific management issues that triggered the initiation of the MSP process, such as multiple conflicts, ecological degradation, community interest or the need for implementing a specific legislation. The purpose of using indicators in MSP processes includes:

1. Monitoring key characteristics of marine and coastal ecosystems against desired conditions.
2. Evaluating marine management options.
3. Tracking progress and effectiveness of implemented measures and actions.
4. Taking into consideration the short, and the long-term objectives of the spatial plan.
5. Guiding adaptive management.
6. Support implementing the ecosystem approach.
7. Helping providing and helping communicating relevant information to decision-makers.

According to the plan's relevant domains finally a set of indicators will be selected choosing from the review of other projects analysed as best practices. Every one of the domains is represented by at least by 4 indicators. Moreover each indicator is linked with the correspondent sub-domain and ecological issue of the Marine Strategy Framework Directive. Starting from the main indicator set a sub-set (core-set) of indicators was identified.

The identification and collecting of data for measuring indicators can be a very difficult and challenging process. Therefore, a simple, preliminary ranking of relative importance of the main types of indicator in relation to the ease of gathering will facilitate the process.

When selecting the indicators to be measured in the spatial assessment of various domains or for the strategic framework, other pragmatic issues should be taken into account. These refer mainly to relevance and data availability. Indicators could be easy or difficult to gather and important or less important for the project. Indicators collection should aim to gather important ones, even if they are difficult to acquire. Main sets of indicators could be acquired through consultation of:

- relevant legislation and regulations related to the sea and coastal areas;
- sectorial development strategies relevant for developing the MSP;
- studies elaborated by specialists from various fields, related to the interests of the marine areas (e.g. the extractive industries related to the existence of underwater reserves).

Specific indicators for analysis and evaluation

Domain	**Sub-domain**	**Indicator**	**Definition**	**Measurement units**
Environment - general features and resources				
General features *of the marine and coastal space*	*Climate*	Atmospheric conditions	*Air temperature regime*	^{o}C
			Precipitation quantities/concentration	mm/year
			Wind regime	%; m/s
			Cloud cover – mostly clear	%; h
			Solar radiation at the Earth`s surface	cal/cm^2/ year
	Geographical and physical conditions of the coastal	Shoreline conditions	*Shoreline dynamic* (length of dynamic coast-line)	m
		Geology	*Sediments/lithology*	m, km^2

Domain	Sub-domain	Indicator	Definition	Measurement units
	space	Coastal erosion	*Erosion/ accretion* (variability rate; land lost per year)	m
	Geographical and physical conditions of the marine space	Physical conditions of the marine space	*Bathymetry* gradients	m
			Water temperature variability	^{o}C
			Salinity	‰; g/PSU
			Relative *sea level rise*	m
			Extreme weather conditions	No. of "stormy days"
			Waves height	m
		Geology	*Sea bed sediments* (texture, components)	m, km^2
Natural resources	*Marine living resources*	Fish stocks and fish landings	*Main fish stocks by main commercial species and sea area*	%
			Spawning stock biomass by main commercial species	%
			Fish assemblage structure	species
			Landings and fish mortality rate by main commercial species	%
		Shellfish	*Population by species/density*	no.
		Algae and marine plants	*No. of species*	no.
	Marine non-living resources	Energy resources	*Resources for energy sector: coal, oil, natural gas*	thousand tones, m^3
		Mineral resources	*Deposits of rock, salt, limestone, sand, gravel, etc.*	thousand tones
		Balneal waters	*Mineral waters with salt, sulphur compounds, etc.*	m3
		Renewable energy	*Areas for off-shore wind farms*	ha
	Ecosystem quality	Dissolved Oxygen	*Amount of oxygen dissolved in the sea water*	µM (micromoles/L) and %
		Hypoxia	*Number of hypoxia events and/or extent of hypoxic areas*	No.
	Natural resources extent	Marine and coastal natural resources zones	*The area destined for natural resources exploitation*	ha
Natural and anthropic damaging processes	*Air quality*	Pollutants in the air	*Amount of pollutants emitted into the air*	mg
		Toxic emissions	*Number of toxic emissions released*	No.
		Dispersion of pollutants	*Dispersion area of pollutants exceeding MAC (maximum allowable concentration)*	km2
	Water quality	Type of pollutants	*Amount and type of pollutants discharged into the environment, groundwater*	to
		Sewage and industrial wastewater	*Volume of untreated sewage and industrial wastewater*	m3
		P and N enrichment	*Areas affected by eutrophication*	km²
			Direct effects - chlorophyll annual concentrations	µg/L
			Indirect effects of eutrophication hypoxic events - bottom dissolved	µM and %
		Primary productivity	*Chlorophyll a (column, surface) Phytoplankton*	µg/L cell/L
		Ecological Index (EI)	Ecological State of coastal and transitional waters	
		Volume of treated wastewater	*Volume of water treated mechanically, chemically, biologically in the wastewater treatment plants*	m3
		Degraded and polluted watercourses	*Length of degraded (class IV) and polluted (class III) watercourses*	km

Domain	Sub-domain	Indicator	Definition	Measurement units
		Coastal water quality (bathing)	*The percentage of bathing water corresponding to the values of the European Bathing Water Directive*	%
		Amount of nutrients in coastal waters	*Concentration of nitrates and phosphates in coastal waters*	µM
		The extent of oil pollution	*Volume of oil spills*	m3
		Amount of litter in seawater	*Trends in the amount of litter washed ashore and/or deposited on coastline*	m3/Km^2 m3/Km
	Soil quality	Areas affected by soil pollution	*Surfaces affected by acid or alkaline rain*	km²
			Areas polluted with substances exceeding CMA	km²
			Areas affected by soluble toxic substances and heavy metals	km²
	Pollution extent	Areas affected by *pollution*	*Marine areas affected by pollution/noise*	ha
	Vegetation quality and the animal quality of life	Vegetation quality	*Land surface of irrecoverable plant ecosystems*	ha
		Animal quality of life	*Proportion of endangered species out of total*	%
	Natural risks, climate changes	Landslides	*The surfaces affected by landslides*	ha
		Surface affected by erosion and accretion	*Areal extent of coastal erosion and coastal instability*	ha
		Shoreline exploitation	*Length of protected and defended coastline (by category hard, soft)*	Km
		Floods	*Surface affected by floods*	ha
		Desertification	*Surface affected by desertification*	m/an
		Earthquakes	*Seismic intensity*	MSK
		Natural, human and economic objectives under the influence of risk	*Number of inhabitants living in the risk areas*	No.
		Risk protected areas	*The surface of protected areas in the risk areas*	ha.
		The number of days with severe weather phenomena	*Extreme heat days, severe cold, high wind etc.*	No. days
	Technological risks	Areas with radioactive risks	*Surfaces which may be affected by radioactive radiations*	km2
		Activities with risk of producing major *chemical* accidents	*Economic units operating with risk of producing major accidents involving dangerous chemicals*	No.
Pressures on marine environment	*Pressures on biodiversity*	Overfished stocks of commercially important species	*Targeted fish stocks related to fishing vessels through boat buy-back programs*	To.
		Fisheries impact on the marine ecosystems	*Fishing fleets trends*	No.
		Marine mammal migration routes (90% protection till 2018)	*Number of vessel strikes or deaths of marine mammals*	No.
	Pressures by touristic and recreational activities	Beaches for balneal activities	*Coastal areas provided for beaches*	Ha, No. places
		Campgrounds	*Surface and capacity of campgrounds*	Ha, No. of visitors
		Water surface for water sports	*Surfaces allocated to sailing, kayaking and motor boating*	Ha.
		Effects of recreational boating and fishing on sensitive habitats	*Motor Boats /VMS* *Water quality, biota*	No.

Domain	Sub-domain	Indicator	Definition	Measurement units
		Bathing water quality	*Percentage of designated coastal bathing waters compliant with the guide value of the European Bathing Water Directive.*	%
Natural environment protection				
Biodiversity valuable areas	*Biodiversity and habitats*	Natural capital	*Number of habitat types and species by conservation status category*	No.
			Habitat types and species within each category of the Conservation Status (CS) as a proportion of the total number of habitat types and species within the SPA/BD protocol and Habitats Directive Protocol	%
		Designate fish spawning and nursery areas as critical habitat	*Percentage of total sub-region area*	Ha., %
		Designate habitat of diving birds as critical habitat	*Surface area of diving bird habitats designated as critical and effectively managed*	Ha.
		Endangered, threatened and vulnerable species		No. of species
		Threatened and vulnerable species		No., %
	Protected natural areas	Number and the surface of protected areas by categories	*Marine protected areas of local interest*	No.,Ha
		Conservation status of each focal habitat	*Conservation condition of coastal and marine focal habitats and species in protected areas.*	Ha.
Built environment				
Settlement network and cultural heritage	*Coastal settlements affecting the marine space*	Localities size	*Size categories of localities by number of inhabitants*	No.
		Total number of dwellings	*The number of dwellings, of which holiday homes*	No.
	Urban development	Dynamics of built-up areas	*Increase of built-up areas compared to the base year*	%
		Dynamics of housing stock	*Homes built annually compared to the base year*	%
	Cultural heritage	Total classified historical monuments, incl. marine archeology sites	*Classified historical monuments according to legal documents*	No., Ha.
		Cultural landscapes	*Areas with valuable land-sea landscapes*	Ha.
Technical infrastructures networks	*Ports* infrastructures	Ports areas	*Surfaces affected to ports operations*	Ha
		Ports capacities	*Production capacity of the port*	No. of vessels/year
		Ports activity - volume of port traffic and shipping flow	*Number of visiting vessels in port per year, from which fishing vessels*	No. / year
			Total number of incoming and out coming passengers per port	thousands of To
			Intensity of naval transport: volume of type of cargo handled per port	thousands of To. */year*
	Coastal transport infrastructures	Traffic volume of freight by railway and roadways	*Traffic volume of freight per year between the pairs of origin-destination*	No/To. per year
		Degree of motorization	*Number of vehicles registered in a defined area per 1000 people*	No./1000 people
		Fleet of vehicles	*Number of commercial vehicles*	No.
		Airports operations	*Traffic of passengers and freight per airport and year*	No. / year To./ year

Domain	Sub-domain	Indicator	Definition	Measurement units
	Watershed management	Flood defense works	*Length of flood defense works (dykes, defenses of banks, water course adjustment)*	km
		Volume of accumulated water	*Volume of accumulated water for various uses (water supply, power generation, flood reduction)*	millions of m^3
	Water supply and sewerage of wastewater networks	Population connected to the water supply/sewerage system	*Population having water and / or sewer connection and benefiting, on a contract basis, from services of water supply /* sewerage.	No. persons
		Flow of wastewater in treatment plants in operation	*Capacity of installations in operation at the end, cleaning wastewater pollutants.*	thousands of m^3/year
	Energy generation and transport	Power production	*Installed power capacity by plant*	MW
			Power generated by plant type	GWh
		Renewable energy resources	*Areas with resources of renewable energy*	km^2
			Power generated by renewable power plants /farms	GWh
	Exploitation/transport of crude oil and natural gas and petroleum products	Natural gas transportation and distribution	*Number of localities with natural gas distribution*	No.
		Natural gas and petroleum exploitation and transportation	*Number of refineries*	No.
			The processing capacity of the refinery	million to./ year
	Thermal energy distribution	Number of apartments supplied with heat from the centralized systems	*Number of localities / apartments connected to district heating system (SACET).*	No.
	Telecommunications	Telecommunications cables	*Length of optical fiber and telecommunications cables on coastal and marine routes*	km
	Waste management	Waste generation and storage	*Categories of collected waste (municipal, port, industrial wastes), quantities*	To. / year
			Waste platforms (number and area)	No., Ha.
			The area contaminated with solid waste	Ha.
		Waste processing	*Sorted waste percentage at source*	%
			Recycled waste percentage	%
			Incineration plants (number, capacity)	No., To.
Marine and coastal zoning				
Main areas for economic uses and natural processes	*Marine area*	Natural areas and habitats with biodiversity	*Areas with biocenosis habitats, ecosystems, and ecological processes*	Ha, %
		Natural /cultural protected areas	*Existing protected areas and areas proposed for protection*	Ha, %
		Areas for economic activities and uses	*Commercial fishing / aquaculture areas*	Ha, %
			Operating offshore installations	Ha, %
			Recreational areas offshore	Ha, %
	Coastal area	Natural /cultural protected areas	*Existing protected areas and areas proposed for protection*	Ha, %
		Areas for economic uses	*Areas for agriculture, aquaculture and forestry*	Ha, %
		Areas for built environment	*Built up areas for settlements and large infrastructures*	Ha, %
		Military operations areas	*Coastal and offshore military areas*	Ha, %
Socio-demographic processes				
Population and demographic structures	*Population structures*	Total population	*Number persons with Romanian/Bulgarian citizenship and permanent residence on the national territory, delimited by territorial-administrative criteria*	persons

Domain	Sub-domain	Indicator	Definition	Measurement units
		Population density	*The number of people living per unit of an area (e.g. per square km)*	pers./km^2
		Structure of population by age	*% of population among various ages (0-14, 15-64, 65+)*	%
		The total number of households	*The household consists of one or more persons living together.*	No.
	Population growth	Demographic growth	*The rate of population growth, conventionally expressed in percentage units per year.*	%
	Population movement (natural and migratory)	Natural increase	*The balance between the number of live-births and the number of deceased persons during the reference year*	‰
		Migration balance	*The difference between the number of persons having entered or left the territory in one year per 1000 inhabitants.*	‰
Human resources	*Labour force*	Employment rate	*Employment rate represents the ratio between employed population and population in working age, expressed as percentage*	%
		Unemployment rate	*Unemployment rate represents the ratio between the number of unemployed and active population expressed as percentage*	%
	Education	Education level of population	*The population structure by completed educational level*	%
Economic activities				
Macroeconomic context of the cross-border area	*The economic profile of the marine and costal area*	Employment by sector, from marine activities	*Distribution of employees from marine activities*	No., %
		Turnover by sector, from marine activities	*The value of turnover from marine activities*	Euro
	Economic activity of ports and off-shore facilities	Shipments (quantities, persons)	*Port activity, types of services performed*	Tons, pers.
		Turnover or revenue by port	*The value of turnover or revenue from marine activities*	Euro
	Economic performance of cross-border area	Gross domestic product (GDP)	*Gross domestic product is the sum of gross value added of various institutional sectors or various activity branches plus taxes and are deducted subsidies on products*	Euro/year
		Gross value added (GVA)	*The measure of the value of goods and services produced in an area, industry or sector of the economy*	Euro/year
Primary sector	*Agriculture and forestry- activities in the proximity of the sea*	Number of enterprises	*Structure of agricultural production units*	No.
		Agricultural and forestry areas by use	*Surface of arable land, pastures, hayfields, vineyards, irrigated areas,* forests	Ha, %
		Employment in agriculture, fishing and mariculture	*Number of persons employed in agricultural activities*	No.
		Economic performance of agriculture, fishing and mariculture	*Results achieved by agricultural fishing and mariculture activities (Turnover, Gross Value Added)*	millions Eur.
	Fishing and mariculture	Fish stocks	*State of the main commercial fish stocks by species and sea area*	To.
		Fish production / over stock	*Quantities of fish caught in commercial fishing operations*	To.
		Fisheries	*Number and surface of sea fisheries*	No., Ha
			Quantities of fish produced in fisheries	To.
		Mussels farming	*Number and surface of mussels farms*	No., Ha
			Quantities of mussels produced in farms	To.

Domain	Sub-domain	Indicator	Definition	Measurement units
Secondary sector	*Industry and construction*	Number of enterprises	*Structure of industrial activities by sub- branch*	No., %
		Employment in industrial and construction activities	*Employment structure in industry and construction*	No. %
	Services	Number of enterprises	*Service activities, by category of service*	No. %
		Employment in services	*Structure the number of employees by type of service*	No. of places, %
		Economic performance of industrial, construction and service activities	*Results achieved by enterprises (Turnover, Gross Value Added)*	millions Eur.
Tertiary sector	*Tourism, leisure activities*	Touristic and leisure structures	*Tourist accommodation establishments - total and categories*	No. of units
		Touristic accommodation capacity	*The number of touristic accommodation places recorded in the last reception, homologation or classification document*	No. of places
		Touristic flows	*Arrivals of tourists in establishments with functions of touristic accommodation*	thousands of tourists
			Overnight stays in the establishments of touristic accommodation	thousands of tourists
		Touristic structures performance	*The total number of overnight stays related to the touristic accommodation capacity, in a time period.*	%
			The average length of stay (calculated by dividing the number of overnight stays realized with the number of tourist arrivals	nights / tourist
		Employment in tourism	*Total number of employees in tourism*	No. of places, %
		Economic performance of touristic activities	*Results achieved by enterprises (Turnover, Gross Value Added)*	millions Eur.
	Transport - coastal and maritime activities	Number of enterprises	*Structure of transportation enterprises*, of which in maritime activities	No.
		Employment in transport	*Total number of employees in transport*, of which in maritime activities	No.
		Economic performance of transport activities	*Results achieved by enterprise*, of which in maritime activities *(Turnover, Gross Value Added)*	millions Eur.

Common methodology for analysis and spatial planning

Phase I: Current situation analysis of the Romania - Bulgaria cross-border maritime and coastal areas

Task 1: Introduction to specific problems of the study

Task purpose: the task aims at organizing the planning process, collecting and preparing all available data and information for the next planning phases.

Task 2: Current situation analysis through detailed studies (ex-post analysis)- studies of the significant processes, with spatial relevance, present in the maritime and coastal cross-border area.

Task purpose: the analysis of the previous evolutions of the main processes, present in the marine and coastal cross-border area, in relation with their spatial footprint. The main processes fall into four broad categories: natural environment, socio-demographic, economic and built environment.

Task 3. Assessment of the previous evolutions, selection of main problems and opportunities (sectorial diagnosis)

Task purpose: the sectorial diagnosis aims at structuring the problems, disparities and priorities highlighted in the analyses. The diagnosis aims at organizing and ranking problematic situations and development potentials encountered in the cross-border area, identifying and establishing priorities for action, establishing a hierarchy based on their significance.

Task 4. Stakeholders' consultation - establishing institutional awareness of the problems and priorities to be addressed by the spatial plan

Task purpose: to involve stakeholders effectively in the spatial planning process of the marine cross-border area by confronting their opinions about the problems and opportunities, in their fields, with the results of previous task assessments.

Phase II. Analysis of the future evolutions

Task 1. Prospective analysis - study of the **future developments** in key areas related to marine space (ex-ante analysis)

Task purpose: to investigate the future situation of the **significant processes** and their spatial aspects, present in the marine and coastal area.

Task 2. Overall diagnosis - formulation of **development scenarios**, selection of the optimal scenario

Task purpose: the overall diagnosis aims at constructing, assessing and choosing the **strategic development scenario(s)** that suits best the development necessities of the marine and coastal cross-border area.

Task 3. Stakeholders' consultation - establishing agreements on goals and priorities of the spatial plan

Task purpose: to identify the stakeholders' intentions, priorities and goals, based on interviews and questionnaires, in relation to the strategic scenarios identified in the previous task.

Phase III. Strategy formulation
Task 1. Formulation of the common strategic framework (vision, principles, goals)

Task purpose: to establish strategic guiding principles and goals, by taking into account the results of the overall diagnosis (technical experts' findings) and the stakeholders' opinions regarding the marine space development.

Task 2. Formulation of the strategic objectives and action plan in accordance with the goals agreed
Task purpose: to develop specific objectives and actions from the previously stated goals and directions of action established by the development scenario(s).

Task 3. Stakeholders' consultation - approval of the strategic objectives and action plan by the stakeholders involved (setting the basis for the cooperation framework)
Task purpose: dissemination of the proposed plan in order to obtain stakeholders' approval for the common strategic framework of the cross-border marine space.

Phase IV. Setting the monitoring framework
Task 1. Creation of a common spatial database for marine areas in Romania and Bulgaria
Task purpose: to develop the spatial database for the cross-border area Romania –Bulgaria to be employed in maritime spatial planning.

Task 2. Defining indicators to be monitored and monitoring procedures
Task purpose: to give the methodological guidelines for the selection of indicators needed to characterize the plan outcomes and for the performance measurement procedures.

Task 3. Creation of a data sharing centre supporting the cross-border maritime spatial planning activities
Task purpose: to identify the guiding lines for organizing a body meant to facilitate the information exchange between the two countries, in supporting the process of marine spatial planning in the Black Sea areas.

Outputs of component 1.2.2, as established in the Grant Agreement, are:
- Common methodology for analysing MSP- detailed description of the phases of the MSP
- Description of the determined methodology
- Rationale and description of selection process for the project area of the MSP
- Evaluation of MSP best practices in the border area

Accurate description of procedural steps followed within the development of cross-border MSP

Phase I: Current situation analysis of the Romania - Bulgaria cross-border maritime and coastal areas

Applies to component: 1.1.1 Elaboration of detailed studies for a complete analysis of the Romanian and Bulgarian marine areas,
1.1.2. Case studies on major challenges within the Romania and Bulgaria maritime space
1.1.3. Reviewing the institutional and legislative framework relevant for Black Sea maritime spatial planning in Romania and Bulgaria
1.2.1 Setting out the institutional framework for cooperation in cross-border MSP
1.2.4. Elaboration of a maritime spatial plan for the cross-border area (Mangalia- Shabla).

Task 1: Introduction to specific problems of the study

Task purpose: the task aims at organizing the planning process, collecting and preparing all available data and information for the next planning phases.

Task 2: Current situation analysis through detailed studies - studies of the significant processes, with spatial relevance, present in the maritime and coastal cross-border area.

Applies to component: 1.1.1. Elaboration of detailed studies for a complete analysis of the Romanian and Bulgarian marine areas
1.1.2. Case studies on major challenges within the Romanian and Bulgarian maritime space
1.2.4. Elaboration of a maritime spatial plan for the cross-border area (Mangalia - Shabla)

Task purpose: the analysis of the previous evolutions of the main processes, present in the marine and coastal cross-border area, in relation with their spatial footprint. The main processes fall into four broad categories: natural environment, socio-demographic, economic and built environment.
For each domain of analysis, the basic **indicators will be collected** and handled in order to determine the significant processes, problems, potentials and needs of development for each one, related to their spatial aspects (see annex 3). The analysis will be carried out simultaneously throughout the cross-border area.

Methodological steps:

2.1. Analysis of the spatial structure of the plan area

Purpose: this step is intended to make a characterization of each significant process, present in the cross-border marine and coastal area, in relation with its relevant **spatial aspect** (geographically delimitated area, location and route). The specificity of the marine area spatial planning and management is the total lack of landmarks. The delimitation or localization of the processes occurring in the marine space should be done by establishing geographic coordinates or with reference to their habitats.

The previous evolutions of marine and coastal processes are studied using indicators in time series (prior to at least 10 years), in order to highlight the former changes in relation with their spatial aspects.

Topics for analysis:

The content of the analyse, which will be followed throughout the entire planning process, is specific to the marine area, consisting of domains (i.e. natural environment, marine economic activities and transport, etc.) subdomains (i.e. marine ecosystems, coastal ecosystems, etc.) and determining factors of the processes (i.e. weather and oceanographic conditions, geology etc.). For the elaboration of the marine spatial plan the following content will be pursued:

2.1.1. Natural environment

Marine and coastal features and resources
The analysis will be focused on the **natural processes and resources** present in the marine area and the factors that affect their sustainable existence in relation with the coastal influences. The **ecological and anthropic processes** will be put in relation with their **spatial features,** meaning areas, routes and locations, that constitute the **physical partitions of the marine space,** which will be the subject of planning and management.

The main natural **ecological processes** present in the marine area are the **ecosystems,** which subsistence (healthy marine ecosystems sustainability) and connectivity (the exchange of individuals among geographically separated subpopulations), must be observed by the spatial plan in order to improve the ecosystems status.

Habitats are the basic spatial division sheltering an **ecosystem.** Maintaining habitat diversity - the number of different habitat types within a given area - and integrity is an important component of healthy marine ecosystems.
Habitat data (e.g., mapping) are relatively easier to collect than species-level data.
Further subdivisions of the marine space are the **biogeographic regions** (ecologically and biologically significant areas), including several habitats and the **eco-regions** (including a number of biogeographic regions).
Habitat types will be identified and mapped, especially those recognized or identified under Community legislation and those which by their characteristics, location or strategic significance merit a particular reference.
The marine ecosystems are influenced by a number of **factors**, natural and anthropogenic, acting, from air, from land and from the sea.

- *Marine habitats*

- *Coastal habitats*

Natural resources are components of the natural environment, potential and exploited by economic processes. The marine and coastal areas include living and non-living resources:
- *Marine living resources*
- fish stock (species, distribution, population, spawning and nursery areas)
- shellfish (species, distribution, abundance, trends)
- algae and marine plants, marine mammals (species, distribution, population, trends)
- invasive species (species, distribution, population, trends), spawning ground and nursery

- *Marine non-living resources*
- oil and gas
- gravel and sand
- balneal water resources
- renewable energy
- mineral resources - areas concessioned for exploration/exploitation

General factors that influence the natural ecosystems:
Geographical and physical conditions of the marine areas
- bathymetry
- water temperature (column, surface water temperature)
- salinity (column, surface salinity)
- nutrients and oxygen
- waves height
- currents (velocity, direction)
- extreme weather conditions
- sea bed geology and topography

- oceanographic/marine stations (in the Black Sea)

Geographical and physical conditions of the coastal areas
- shoreline conditions
- geology
- coastal erosion
- hydrographical network, riparian ecosystems
- coastal lakes, wetlands linked to marine ecosystems

Climate
- air temperature, freezing regime
- precipitation quantities
- wind regime
- cloud cover
- solar radiation
- weather stations (location, measured variables, statistical values)

Natural and anthropic damaging processes
The natural environment is damaged or put at risk by natural and anthropic processes. Their analysis comprises covering the following issues:

*Evaluating the **quality of environmental features*** which influence the marine ecosystem:
Air quality – identifying areas affected by air pollution
Water quality – identifying watercourses and marine areas affected by pollution
- marine contaminants (traces heavy metals, pesticides, hydrocarbons)
- marine / traces nutrients
Soil quality –areas affected by soil pollution (unauthorized storage of municipal and industrial waste, waste water spill, soil fertilization, etc.)
- identifying marine areas affected by pollution- pollution extent
- identifying marine areas affected by underwater noise

Natural risks, climate changes **–** identifying areas and processes prone to risks:
- erosion
- floods, tsunami risk
- landslides
- earthquakes
- natural risks in marine areas

Technological risks:
- inland technological risks
- marine technological risks (waste water spills, oil discharges, shipping accidents, contamination by hazardous substances).

Pressures on marine environment

Natural resources exploitation:
- *marine living resources* - fisheries impact on the marine ecosystems
- *marine non-living resources* -oil, gas, sands and gravel *exploitation*

Pressures by touristic and recreational activities
- beaches for balneal activities
- campgrounds
- water surface for water sports
- effects of recreational boating and fishing on sensitive habitats
- bathing water quality

Natural environment protection
In order to maintain the integrity of marine habitats and the sustainable use of natural resources, several areas must be placed under protection regime. The study will highlight their geographical distribution, evaluation and development trends in relation with a number of criteria.

Biodiversity and habitats
- benthonic habitats
- pelagic habitats
- thriving or declining processes of natural areas

Protected natural areas
- protected areas (Nationally and EU designated protected areas, habitats and species under Habitats Directive)
- protected areas to be declared (marine, coastal)
- scientific research and monitoring network

The criteria for identifying ecologically or biologically valuable marine areas are:
Uniqueness or rarity: Areas containing species: (i) unique (the only of its kind), rare (occurs only in few locations) or endemic (unique to a particular geographical place), populations or communities, and / or (ii) Single rare or distinct habitats or ecosystems; and / or (iii) unique or unusual geomorphological or oceanographic features.
Importance of the species and / or habitats threatened, endangered or declining: The areas (i) containing habitats for the survival and recovery, endangered species disappearing, shrinking; or (ii) with significant combinations of these types of species.
Vulnerability, fragility, sensitivity or slow recovery: Areas that contain a relatively high percentage of habitats, sensitive biotope (small, uniform occupied by a community of organisms), or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.
Biological Productivity: Zone with species, populations or communities with a comparatively higher natural biological productivity.
Biological diversity: Zone (I) containing comparatively higher diversity of ecosystems, habitats, communities, or species, or (ii) with higher genetic diversity.
Natural character: areas with a relatively high degree of naturalness as a result of the lack or a low level of disturbance or human-induced degradation. (Source: Convention on Biodiversity 2008).

2.1.2. Built environment
This step aims at determining the urbanization processes and technical infrastructures that affect the marine areas by replacing the shore habitats or directly influencing the marine space.
The structure and characteristics of the coastal built environment have a number of adverse effects on the marine areas which consist of pollution, sedimentation, reduction of the coastal habitats and destruction/disturbance of sea habitats.

Settlements network and cultural heritage
Coastal settlements affecting the marine space
In order to perceive the development of localities affecting the marine space, the study includes an assessment of the following features:
- size categories of localities based on the number of inhabitants and built-up area
- administrative and territorial hierarchy

- settlements' functions determined by dominant economic activities, with emphasis on sea related activities

Urban development

The concentration factors of polarization in urban centres are analysed by examining the number and location of the following features:

Social and economic facilities, housing, with focus on:

- tourism (no. of units, capacities)
- industry, manufacture and storage
- recreation (beaches, leisure ports and parks)
- size of housing stock, of which holiday homes (incl. condominium);

Cultural heritage

Concentration and location of the built cultural heritage, presented as:

- urban and rural areas with protected ensembles and objectives
- marine areas with protected ensembles and objectives (marine archaeology)
- cultural landscapes

The polarization processes, influenced by the above mentioned factors, are noticeable through population influx to centres, as inhabitants or visitors. The study will take into account the following types of urban growth:

- metropolitan areas, urban systems and other structures
- functional areas, critical areas regarding pressures on the costal and marine areas
- expansion of build-up areas and other phenomena of growth affecting marine areas

Technical infrastructures networks

The analysis of the influence of technical infrastructure on marine space will shed light on the extent of these facilities, especially those for maritime transport, waste and water management, which have the most significant effects on marine areas.

The analysis of the current situation and effects of relevant infrastructures on marine areas will be carried out considering the following categories of infrastructures:

Specific **transport infrastructure** - spatial situation, characteristics and activity impact on marine areas:

Ports infrastructures

- ports and shipyards infrastructures (number and types of ports, capacities, area of the ports)
- shipping (shipping routes, anchorage areas)
- port traffic and shipping flow
- dredging and dumping of dredged material

Coastal transport infrastructures

- major roads (road hierarchy, overpasses, bridges) with impact on marine space
- major railroads (routes, stations) affecting ports' activity and coastal settlements
- intermodal transport (including border crossings)
- air transport (airlines, airports, capacities)

Water management works - spatial localization and characterization of the actual state and effects on marine environment.

Watershed management:

- flood defence works on torrents and streams
- reservoirs for water supply and other uses, flood protection
- potable water adductions

- coastal erosion protection / coastal defence (hydraulic structures, artificial sanding/beach nourishment)
- Danube discharge and other rivers run-offs

Water supply and sewage networks situation will highlight the following aspects:

- population connected to water supply and sewerage networks
- capacity to provide drinking water
- specific consumption of drinking water
- seawater extraction
- dynamic of water supply and wastewater sewerage
- debit of active treatment plants

Land improvements works - spatial situation and characterization of the actual state, considering their impact on marine areas:

- irrigation
- drainage
- soil fertilization

Energy generation and transport facilities - spatial situation and characterization of the infrastructure, with regard to the following:

Power production

- power production plants
- electricity transportation lines (220, 400 kV)

Renewable energy resources:

- renewable energy production areas, off-shore and in-land
- renewable energy produced, off-shore and in-land

Exploitation/transport of crude oil and natural gas and **petroleum products -** spatial localization and characterization of infrastructure for operating marine platforms and pipelines networks.

- off-shore infrastructures
- under water pipelines

Thermal energy distribution (large district heating systems)

Telecommunications: telephone systems, optical fibber cables, submarine cables.

- communication cables

Waste management facilities (domestic and industrial) **-** characterization and impact analysis of waste landfills on marine areas:

Waste generation and storage

- waste generation by type
- waste storage in the coastal areas and at sea - optimization of final waste disposal;

Waste processing

- waste reception facilities in ports
- technical waste management alternatives - waste recycling and reuse
- remedial actions (rehabilitation of contaminated sites, including old landfills)

2.2. Analysis of the current socio-demographic processes occurring in the coastal area and their location.

Purpose: to highlight the main features of the social and demographical processes present in the coastal area (number, structures, movement and participation in economic activities). The

demographic processes influence urbanization and economic activities with impact on marine space.

Analysis topics:

2.2.1. Characteristics of the **population and its demographic structures**:

- population size and evolution (total population)
- spatial distribution of the population (population density)
- demographic growth (% of population growth between censuses)
- population structure (population by age groups, gender, urban and rural areas
- natality and mortality (birth rate, mortality rate)
- migration (net migration rate, emigration rate, immigration rate)
- household structure (average household size)

2.2.2. The structure and evolution of **human resources** and human wellbeing in the coastal area, with the following topics:

- structure and dynamics
- qualification levels
- employment by sectors and economic activities, highlighting communities wellbeing and urban development
- unemployment

Labour resources - represent a category of the population possessing all the physical and intellectual capacities that allows it to perform useful work within the national economic activities. Labour resources include: the population of working age, able to work, and employees under and over working age.

Inputs: - indicators (time series for the last 10 years) describing socio- demographic processes;

Outputs: - report describing the main social and demographical processes (problems, strengths, dysfunctions), with emphasis on employment in activities related to the sea
- maps and graphs representing the spatial extent and characteristics of the analysed processes

References: Intergovernmental Oceanographic Commission and Man and the Biosphere Programme (2009), *Marine Spatial Planning: a step-by-step approach toward ecosystem-based management*, IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO, pp. 56-57.

2.3. Analysis of the economic activities (activities according to NACE, Rev2)
Purpose: analysing and evaluating economic processes and the factors that influence the development of economic activities with significant impact on marine areas.
The study will highlight the intensity of marine and coastal economic activities in terms of employment and results, locating and examining the dynamics of the economic environment, in the past years in order to determine the future trends of development.

Analysis topics:

2.3.1. Macroeconomic context and the economic profile of the cross-border area.

- the economic profile of the marine and coastal area
- economic activity of ports and off-shore facilities
- economic cooperation in cross-border area Romania-Bulgaria

2.3.2. Economic analysis by sector:

The primary sector: fisheries and aquaculture, agriculture, forestry

- coastal agriculture (structure, dynamic of activities, fertilizers and pesticide usage)
- coastal forests and forestry;

- fishing activities in marine areas;
- fisheries and aquaculture (potential, structure, dynamic of activities, other information related to the marine production).

Secondary sector: industry and construction activities related to the marine and coastal area:

- industry - including extractive industry (processing the resources of marine and coastal areas, structure and dynamic of activities)
- construction sector - structure and dynamic of the activities linked to development of marine and coastal areas.

Tertiary sector: transport, trade/commerce, services and tourism

- naval transport and related activities
- trade/commerce (structure and dynamic of commercial activities - related to the sea)
- services (structure and evolution of the activities)
  - activities for research and development for marine and coastal areas
  - infrastructure of support for business environment (free zones, business incubators, industrial parks, etc.)
- tourism (potential, concentration of tourists, attractions and tourism infrastructure).

Inputs: - reports on economic development of the main activities present in the coastal and marine areas, highlighting the impact on the marine area

- indicators measuring the evolutions (advisable in time series on 10 years) of the main economic activities of the coastal and marine areas (see annex 3)
- maps representing the spatial extent and characteristics of the analysed processes

Outputs: an inventory of the significant sea related activities; an evaluation report and maps of the current human activities (and pressures) in the marine and coastal area.

References: Intergovernmental Oceanographic Commission and Man and the Biosphere Programme (2009), *Marine Spatial Planning: a step-by-step approach toward ecosystem-based management,* IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO, pp. 55

2.4. Marine and coastal zoning - elaboration of zoning plans for the marine and coastal area, representing the current situation analysed.

The previous analysis of the major natural and human processes, associated to surfaces, aims to reveal the relations between the processes and their support areas (spatial 'footprints').

Zoning is an analysis and procedure of establishing relationships between neighboring areas, in order to identify **conflicts** and increase **cooperation**. Generally, zoning deals with two variables: the **surface** on which a specific process occurs and the dominant **functional profile** of each significant area present in the maritime space.

The studied areas are divisions of surface (on sea or land) provided for economic activities and biodiversity, including habitats, reserves and natural protected areas.

A key part and a centrepiece of the planning process is the identification of **ecologically and biologically significant areas** (including several habitats) in the cross-border marine area. Another step in the zoning process is identification of economic areas that influence the marine ecosystems.

Economic areas are characterized by amount of equipment, intensity of exploitation, or activities and productions (quantities/average values). The natural areas, provided for conservation or exploitation, are characterized by biodiversity or stock size.

The intensity of use highlights the dominant functional profile of marine or coastal areas, these could be: fisheries, aquaculture, mineral and oil exploitation, natural conservation areas, agricultural, forestry, tourism, mixed, etc.

The dominant profile of the present areas must be preserved and/or developed by the spatial plan through strategic objectives and management actions.
A **zoning plan** is the proper instrument for using and developing the marine management plan.

The main purposes of a zoning plan are to:

- **map the marine habitats,** biogeographic regions and eco-regions (ecologically and biologically significant areas)
- provide protection for biocenosis habitats, ecosystems, and ecological processes
- separate conflicting human activities or to combine compatible human activities
- protect the natural values of the marine management area while allowing reasonable human uses of the area
- allocate areas for reasonable human uses while minimizing the mutual effects of human uses and their impact on nature
- preserve some areas of the marine managed area in their natural state, undisturbed by humans, except for scientific or educational purposes

Key elements of a MSP zoning approach include:

- locating and designing zones based on the underlying topography, oceanography and distribution of **biotic communities**
- locating and designing zones of **economic activities and uses**
- designing systems of permits, licenses, and rules within each zone
- establishing compliance mechanisms
- creating programs to monitor, review, and adapt the zoning system

The current situation analysis of the marine and coastal zones, along with their economic and environmental significance and interactions, will reveal the problems, conflicts and advantages (see annex 1) which will be considered in organizing the marine space in the strategic process.
The assessment of cumulative interactions of terrestrial and marine environments will be realized by analysing the above described pairs of zones classified as: inconsistent, probably consistent, compatible**.**

Inputs: - descriptive data and indicators in time series (usually for the last 10 years), available in both countries and covering the whole cross-border area (see annex 3), graphics showing the current situation of specific functional and natural areas.

Outputs: - reports describing the previous evolutions of processes present in the plan area and the geographic delimitation of these processes. Written materials will highlight the problems, strengths and dysfunctions of the analysed processes (issues paper).

- maps showing the zones (spatial “footprints”) of the analysed processes. The graphic material will illustrate the current situation of the marine area and the pressures and the impacts on the marine cross-border area.

- a zoning plan showing the current spatial structure and functional relations between significant zones of the marine and coastal cross-border area.

References: Intergovernmental Oceanographic Commission and Man and the Biosphere Programme (2009), *Marine Spatial Planning: a step-by-step approach toward ecosystem-based management*, IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO, pp. 49-62
ADRIPLAN: Developing a maritime spatial plan for the Adriatic-Ionian Region (2015), Barbanti A., Campostrini P., Musco F., Sarretta A., Gissi E. (eds.)

2.5. Analysis of the supra-territorial context

Purpose: the analysis of the development and influences of the territory **neighbouring** the cross- border area Romania-Bulgaria and of the Black Sea basin (multi-scale approach).

Analysis topics:

Analysis of the plan area in relation to the macro-regional, national and European context will follow the topics:

- identification of **transport corridors** and related **port-cities**, outside/inside the coastal area of Romania and Bulgaria. Identification of economical flows in the Black Sea basin;
- identification of external/internal **development poles** with regional influence which can support the development of the **polycentric settlements network**, related to major cities in the area;
- delimitation of the **neighbouring areas of cooperation** which include the coastline and marine area Romania - Bulgaria;
- presence of the development macro-regions that include the coastal territorial units considered for MSP;
- identification of metropolitan suburban, affecting the marine areas
- presence of areas with ecosystems and marine resources surpassing the cross-border area.

Inputs:

- studies and plans on supra-territorial context of the Romania-Bulgaria marine cross-border area;
- indicators characterizing the areas neighbouring the Romania-Bulgaria marine cross-border area.

Outputs: - descriptions of the influences experienced in the neighbouring zones of the cross-border area and the relations with the external regional, national and international space.
- maps showing the external situation of the cross- border area, with a spatial representation of the relations and influences coming from the neighbouring countries and the Black Sea basin.

References: Emiliano Ramieri, Elisa Andreoli, Angiola Fanelli, Giovanni Artico, Roberto Bertaggia, *Methodological handbook on Maritime Spatial Planning in the Adriatic Sea*, pp. 46-48

Task 3: Assessment of the previous evolutions - selection of significant problems, strengths and opportunities present in the cross-border area (sectorial diagnosis).

Applies to component:

1.1.1 Elaboration of detailed studies for a complete analysis of the Romanian and Bulgarian marine areas
1.1.2 Case studies on major challenges within the Romanian and Bulgarian maritime space.
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia- Shabla).

Task purpose: the sectorial diagnosis aims at structuring the problems, disparities and priorities highlighted in the analyses. The diagnosis aims at organizing and ranking problematic situations and development potentials encountered in the cross-border area, identifying and establishing priorities for action, establishing a hierarchy based on their significance.

Methodological steps:

3.1. **Problems formulation**

A first step in carrying out this task is the accurate identification of relevant planning issues and precise formulation of the problems, which will:

- express clear concepts and precise formulations;
- imply alert solutions;
- avoid interpretations

3.2. Selection and classification of problematic situations and development potentials will complete the SWOT analysis, structured on domains and degrees of priority or importance of each aspect. The main problems and favourable aspects will be processed in order to ease the development of strategic policies for the cross-border area.

3.3. Analysis of problems' causes and effects

Another efficient method of problem assessment and ranking is the "problem tree" analysis, which, after a common understanding of all problems, displays them in the form of a tree diagram.

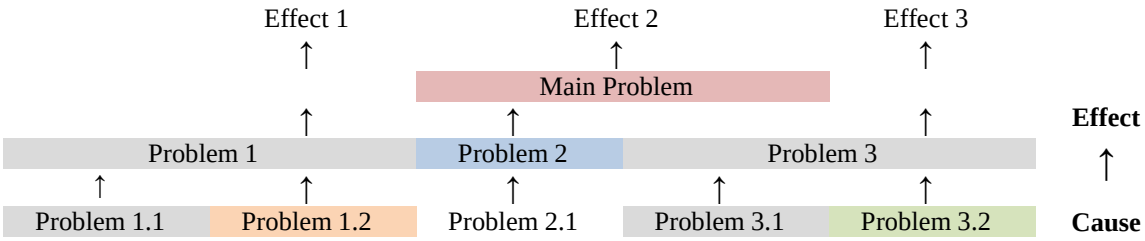
A problem is never an isolated negative perceived situation, but relates to other problems. In the problem tree the relations and hierarchy among all identified problems is expressed. Each stated problem is preceded by the problem(s) which cause(s) it, and followed by the problem it causes itself.

The "problem tree" analysis is suitable to be used as a participatory planning technique, in the stakeholder's consultation stages and in the specific objectives formulation stage.

The problem analysis includes:

- confirmation of the subject of analysis;
- identification of problems related to the subject;
- an inventory of all problems perceived by the participants in the process;
- establishing a **cause-effect hierarchy** between the problems;
- visualization of the cause-effect relations in a diagram.

Diagram of problems



3.4. Assessment of common problems present in the cross-border area

A final step in assessing the analyses results is the comparison between the problems and opportunities revealed in the two countries in order to find common priorities of action. Common problematic areas could be contiguous areas affected by the same pressures or damaging factors. There could be also common problematic distant areas, related by other factors, (meteorological, water currents, transport, etc.) or unrelated, but requiring common approach.

Inputs:

- findings of the former analysis, problems identified, disparities and values of the related indicators

Outputs: - SWOT analysis, problem tree analysis, reports describing the groupings and ranking of the identified problems and strengths
- maps showing the identified problems and development opportunities

References: Intergovernmental Oceanographic Commission and Man and the Biosphere Programme (2009), *Marine Spatial Planning: a step-by-step approach toward ecosystem-based management*, IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO

Task 4: Stakeholders' consultation - establishing institutional awareness on the problems and priorities to be addressed by the spatial plan

Applies to component: 1.1.1. Elaboration of detailed studies for a complete analysis of the Romanian and Bulgarian marine areas;
1.1.2 Case studies on major challenges within the Romanian and Bulgarian maritime space;
1.1.3. Review the institutional and legislative framework relevant for Black Sea maritime spatial planning in Romania and Bulgaria
1.2.1 Setting out the institutional framework for cooperation in cross-border MSP
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia- Shabla).

Task purpose: to involve stakeholders effectively in the spatial planning process of the marine cross-border area by confronting their opinions about the problems and opportunities, in their fields, with the results of previous task assessments.

Stakeholders' consultation is a selective and iterative process which implies the evaluation of each group of people affected by the plan, informing them and using their feedback in the planning process.

Methodological steps:
4.1. A first step is establishing **who** should be involved in the process.
Stakeholders' involvement in MSP includes those who:
- Are or will be affected by MSP decisions;
- Are dependent on the resources of the management area;
- Have or make legal claims or obligations over areas or resources within the management area;
- Conduct activities that impact on areas or resources of the management area;
- Have special interests in the management area

4.2. Another decision to be made is **when** stakeholders should be involved.
Stakeholders must be involved in the planning process at least in three stages:
- Defining and analysing existing conditions,
- Defining and analysing future conditions,
- Strategy formulation - approval of the strategic objectives and action plan.

4.3. The next step of the task is the decision about **how** stakeholders are involved.
Stakeholders will be involved according to their motivation and role in the marine and coastal area.
Their involvement intentions and opinions should be recorded and organized in the form of a questionnaire, presented for example as the following table:

Field of activity	**Stakeholders** (institutions, representatives of interest groups)	**Relevant legal docu-ments**	**Motivation/ influence** (strong/weak)	**Role / task** (informed, consulted/endorses, approve, decide, monitors, implements)	**Stakeholder opinion** (problems, future conditions, strategies)

4.4. Stakeholders' consultation
At this stage the stakeholders are informed about the findings of the analyses and evaluations, in order to obtain their feedback and confirmation of the problems and strengths identified.

Their response will make reference to problems encountered in their field of expertise and give explanations of the causes. The stakeholders' opinions will be confronted with the results of analyses performed by technical experts, in order to establish the problems and strengths of the area, as a steady base for the next planning phases.

Inputs: findings of the former analyses, SWOT analyses, problem tree analyses, list of stakeholders involved in the project area.

Outputs:
- a list of stakeholders selected and ranked according their involvement in the MSP.
- reports describing the stakeholders' feedback on the previous task findings.
- the hierarchy of problems and strengths, established by confronting the technical experts findings and stakeholders' opinions. The problems hierarchy will establish the relations between causes and effects of the analysed situations.

References: Intergovernmental Oceanographic Commission and Man and the Biosphere Programme (2009), *Marine Spatial Planning: a step-by-step approach toward ecosystem-based management*, IOC Manual and Guides No. 53, ICAM Dossier No. 6. Paris: UNESCO, pp. 43-48.

The results of **phase I** will include:
- research reports describing the findings of integrated and updated analyses on most important fields for maritime spatial planning
- analysis of the situation based on statistical and GIS data of the area
- description of human activities assessed and analysed in the chosen marine areas
- description of experience and best practice in applying the requirements of the Directive on Maritime Spatial Planning.
- identification of additional requirements and gaps
- identification of the relevant stakeholders and the legislative framework in relation with MSP. Description of relevant stakeholder's involvement in cross-border MSP.
- 120 relevant and high quality maps showing the current situation and problems of the analyzed domains (100 for component 1.1.1 and 20 for component1.2.4).

Phase II. Analysis of the future evolutions

Applies to component:
1.1.2 Case studies on major challenges within the Romania and Bulgaria maritime space
1.2.1 Setting out the institutional framework for cooperation in cross-border MSP
1.2.3 Common strategic framework for maritime spatial planning in Romania and Bulgaria;
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia- Shabla).

Task 1: Prospective analysis - study of future developments in key areas related to maritime space (ex-ante analysis)
Task purpose: to investigate the future situation of the **significant processes** and their spatial aspects, present in the marine and coastal area;
The prospective diagnosis is developed by forecasts in the plan's most significant domains (processes), for a period equal to the duration of the plan.
In order to enlarge the "success area" of the projections another three alternative forecasts could be developed: the baseline, optimistic and pessimistic variants.
The baseline variant shows what is likely to happen if there is no intervention in the management (marine) area.

Methodological steps:
1.1. The projections will be built on forecasts of population, for a period determined by development requirements (advisable for 15 -20 years). The projection of the number of

population will be elaborated at the level of local administrative units (NUTS 4 in Romania and municipalities in Bulgaria) and will be corroborated with the official estimations provided by the National Institutes of Statistics. A work force projection, made on the basis of the number of inhabitants, is also useful in estimating the future requirements of the communities' development.

1.2. The forecast of economic activities, for the determined period, will envisage the future development of jobs and economic results (economic units, turnover, added value). The forecast will be focused on the most prominent economic processes and factors that influence the development of economic activities with significant impact on marine areas.

1.3. Based on the results of the above mentioned steps, a forecast of the transport will be performed on the most important routes of the area. The routes considered for the forecast are these linking residential areas and employment centres, supply areas and processing centers, international routes, etc.

1.4. The projections of population and economic activities will be accompanied by their spatial evolutions showing the **future situation** in the area. Maps visualizing the forthcoming situation should determine the administrative units where population disparities are expected to happen and the activities centres where economic development will occur (employment centres) and the situation of traffic on transport routes.

The forecasts will be provided only for use in this project, contributing to the development of the Maritime Spatial Plan.

Inputs:

- evolutions of the spatial relevant domains: environment, population, economy and flows;
- indicators describing trends/dynamic of population, employment, economic activities and natural environment.

Outputs: reports and maps describing the future situation of the marine and coastal area, viewed as a result of the performed forecasts.

Contrary to mapping present conditions, maps elaborated to visualize future conditions should not reflect precise areas and positions. Instead, they should reveal patterns, trends and directions expressed by adequate graphics.

Task 2: Overall diagnosis

Task purpose: the overall diagnosis aims at constructing, assessing and choosing the **strategic development scenario(s)** that suits best the development necessities of the marine and coastal cross-border area.

Methodological steps:

2.1. Development of strategic scenarios

The overall diagnosis is elaborated combining the forecasts, established previously in the prospective diagnostic phase and a deliberate setting of levels of performance for the considered processes (modelling), achievable by the plan policies, in the implementation timeframe.

A scenario is a description of the **current situation** as well as of a series of events that could lead from a current to a **future situation.** Scenario Analysis Method involves **forward projection** which allows to progress from the current situation to a series of alternative, future scenarios.

Strategic development scenarios will be generated through hypothetic changes (benchmarks oriented) induced in the performed forecasts, in order to produce desired deviations of main processes (e.g. change in the volume and structure of population,

influencing the demand for services and utilities, the jobs and services offers, and changes in the ecosystems).

The proposal of development scenarios will be realized in **three versions,** representing the probable limits of the future development of the cross-border area as a whole:

1 – **Current tendencies** (scenario of no intervention)
2 – **Accelerated development**
3 – **Average or limited development**

2.2. Assessment of strategic scenarios versions

The assessment of scenarios versions make possible the identification and selection of the **optimal** development scenario for the coastal/maritime area.
The criteria for determining "decision rules" for the assessment of MSP development scenarios are the following:
- national and international regulations and policies.
- economic and technical considerations related to operational activities.
- physical and environmental conditions.
- preferential conditions (environmental, economic, social).

Topics for **scenario evaluation** include:
Environment: changes produced in marine natural areas, marine and coastal landscapes, biodiversity, protected areas, water pollution, waste management, mineral resources exploitation, quality of the urban and coastal environment, natural heritage;
Economy: modifications produced in employment, investment, turnover;
Socio-demographic processes: population growth, households structure, access to housing;
Built environment (settlements and infrastructures)**:** growth of built-up areas, housing, social and economic infrastructures, energy efficiency, water management, transport, etc.

The proposed new strategy builds on the optimal (preferred) scenario, integrating it with the wider goals of the plan, and setting a **framework** for the detailing of sectorial strategies. On this basis, it is possible to elaborate a more detailed strategy that sets priorities for the individual sectors involved in marine area management.

Inputs:
- findings of the main domains forecasts, benchmarks establishing levels of performance for the considered processes;
- indicators describing evolutions of the most significant processes present in the marine and coastal area: data on ecosystems, socio-demographic changes, economy, transport.

Outputs: - descriptions of three development scenarios: current tendencies accelerated development, average or limited development scenario, goals identified by diagnosis.
- analysis of the impacts of the scenarios on sea related domains (waste, sewage, fishing, tourism, etc.)
- rationale and description of the optimal scenario (preferred scenario) as proposed **strategic direction** for the MSP, with levels and indications for the development of the main processes present in the plan area
- representation of the three scenarios on maps

References:

Marine Spatial Planning: a step-by-step approach toward ecosystem-based management, Intergovernmental Oceanographic Commission and Man and the Biosphere Programme, IOC Manual and Guides No. 53, ICAM Dossier No. 6, Paris, pp. 66-70.

Task 3: Stakeholders' consultation and agreements on strategic goals and priorities for the marine spatial plan

Applies to component:
1.2.1 Setting out the institutional framework for cooperation in cross-border MSP
1.2.3 Common strategic framework for maritime spatial planning in Romania and Bulgaria;
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia - Shabla).

Task purpose: to identify the stakeholders' intentions, priorities and goals, based on interviews and questionnaires, in relation to the strategic scenarios identified in the previous task.

Methodological steps:
The development of this task is based on interviews and questionnaires designed to identify the stakeholders' intentions, priorities and goals for the future development of the area.

3.1. Preparation of consultation documents
The description of the development scenarios will be edited in an understandable form, in order to determine stakeholders' responses regarding their goals, as starting elements for the strategy formulation. The optimal strategic scenario will be explained and recommended according to the involved stakeholders' profile.
The planning staff will identify a potential list of goals resulted from the achievement of the development scenarios. A draft will be prepared and circulated in order to produce feedback from the stakeholders.

3.2. Dissemination of the consultation documents and stakeholders' responses
Reactions from stakeholders will be organized and selected in order to obtain a set of goals for each important domain in the marine area.
A goal is a statement of general direction or intent. They are high-level statements of the **desired outcome** that plan strategy intends to achieve.
These goals and strategic objectives will be compared to the list of goals resulted from the planning staff analysis.
Goals and strategic objectives for each important domain could be obtained also from official sectorial strategies and plans developed for these areas.

3.3. Results review and organization
The step helps to put in relation problems of particular concern in the research areas with the stakeholders' opinions on these issues.
The goals and priorities resulted from stakeholders' feedback; consistent with those revealed by the study, will be taken into consideration in the strategy formulation. The goals issued from the participants' survey, not consistent with the results of the study, will be reformulated until their acceptance by the stakeholders.

3.4. Selection of the optimal strategic scenario(s) and goals
In a final stage, the stakeholders will help choosing the optimal strategic scenario(s) and on this basis, a set of goals and priorities for each important domain relevant in the plan area will be established.

Inputs: - the strategic scenarios that will be presented to stakeholders; a list goals and priorities issued from the overall diagnosis and official sectorial strategies and plans.
- maps and graphs will complete the reports explaining the future possible evolutions and the strategic scenarios developed.

Outputs: reports presenting the results of the stakeholders' consultation, the list of goals and priorities adopted for the marine spatial plan.

References: UNESCO, Intergovernmental Oceanographic Commission (2009), Marine Spatial Planning. A step-by-step Approach toward Ecosystem-based Management

The results of **phase II** will include:

- reports describing the future evolutions of key areas and strategic scenarios developed and the optimal scenario chosen and the goals adopted for the marine spatial plan.
- coordination meetings with the stakeholders; the results of stakeholders' consultation.
- maps and graphs describing the future evolutions of key areas and the strategic scenarios.

Phase III. Strategy formulation

Applies to component:
1.2.1 Setting out the institutional framework for cooperation in cross-border MSP
1.2.3 Common strategic framework for maritime spatial planning in Romania and Bulgaria;
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia - Shabla).

Task 1: Formulation of the common strategic framework (vision, principles and goals)

Task purpose: to establish strategic guiding principles and goals, by taking into account the results of the overall diagnosis (technical experts' findings) and the stakeholders' opinions regarding the marine space development.

Methodological steps:
1.1. Formulation of the spatial vision
The **spatial vision** is a form of shared identity and shared values that provide to the area a sense of the development, based on which can be formulated the strategic development objectives. The vision represents a strategic development concept that encompasses spatial and non-spatial, quantitative and qualitative aspects of development, based on the optimal scenario resulted from the overall diagnostic phase.

The vision of development of the marine space must be concrete and reachable through strategic measures: economic, social, environmental and infrastructural, presented in a concise form, as physical and spatial future situations.

1.2. Correlation between principles and goals
This step aims at establishing relations between **principles** for development/conservation of the marine space and **goals,** as overall planning objectives.
A principle is a basic or essential element or quality determining the intrinsic nature or characteristic behaviour of MSP. Principles can be derived from a number of sources, including international treaties and agreements, national policy and legislation, or examples of good practice. It is important to remember that principles do not stand by themselves, but should be reflected throughout the MSP process and in particular, in the goals and objectives that will be identified later.
MSP environmental basic principles referring to ecosystems are:
Maintaining or restoring species diversity, composition, and functional redundancy:
- maintain native species diversity;
- maintain habitat integrity, diversity and heterogeneity;
- maintain populations of key species.

Other ecological principles can be deducted from the above basic principles: habitat attributes preservation, resilience, water quality preservation, naturalness, etc.
Connectivity: connectivity can occur through the movement of *individuals, nutrients, or materials* across permeable habitat boundaries.

The strategic goals belong to the four key areas of the development: environment, economic, social, and physical, being achieved through specific objectives and actions / public policies (existing or conceivable, applicable at local, regional and national level).

The connection between principles, goals and objectives is illustrated in the next diagram.

Stakeholders opinion	**Strategic process**	Technical experts opinion
↓→	Problem setting ↓	←↓
Mission →	**Goal setting**	**← Principles**
↓	↓	↓
Necessities →	**Specific objectives**	**← SP Process**

Inputs: - principles for development/conservation of the marine space
- goals established through the previous planning process.

Outputs: a set of principles, goals and a vision to guide the development of the marine spatial plan of the cross-border area.
References: UNESCO, Intergovernmental Oceanographic Commission (2009), Marine Spatial Planning. A step-by-step Approach toward Ecosystem-based Management, pp. 40-41

Task 2: Formulation of strategic objectives and action plan in accordance with the goals agreed.
Applies to component:
1.2.3 Common strategic framework for maritime spatial planning in Romania and Bulgaria;
1.2.4 Elaboration of a maritime spatial plan for the cross-border area (Mangalia- Shabla).

Task purpose: to develop specific objectives and actions from the previously stated goals and directions of action established by the development scenario(s).

Methodological steps:
2.1. Formulation of specific objectives for sectorial areas and their components aim at reducing or removing specific gaps and capitalizing on opportunities identified through diagnosis and in relation with the determined goals.
Differences between goals and objectives include:

- Goals are broad; objectives are narrow
- Goals are general intentions; objectives are precise
- Goals are intangible; objectives are tangible
- Goals are abstract; objectives are concrete;
- Goals cannot be measured; objectives can be measured

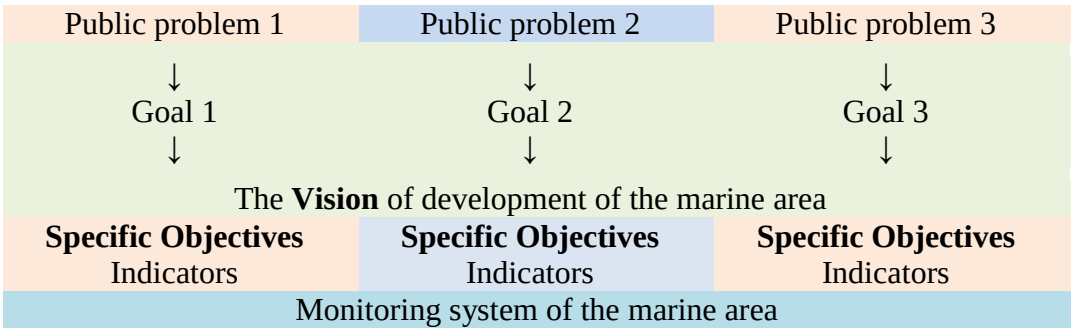
The specific objectives must be in correlation with those of sectorial plans and with the goals resulting from the development vision; these are grouped on issues such as:

- Shipping
- Renewable energy
- Conservation / protection of marine areas
- Sand and gravel operations
- Fishing
- Aquaculture
- Oil and Gas Extraction
- Defence and military equipment areas
- Tourism, recreation

The specific objectives relate to sectorial aspects as: economic growth, social wellbeing, infrastructure networks improvement, environment protection, sustained organizational and legal system, with a specified period of achievement.

The specific objectives have spatial and temporal references; they cover **definite areas** and are **limited in time**. Objectives should be linked to an appropriate indicator(s) and an associated target(s).

The relations between problems, goals, and objectives are illustrated in the diagram below.

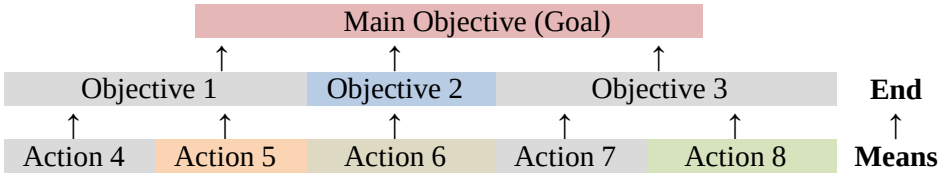


Depending on the specific situation of each marine area / coastal territory and based on the results of SWOT analysis, the objectives may be formulated on the basis of the following combinations:

- objectives based on opportunities supporting strengths
- objectives based on opportunities that allow counteracting weak points;
- objectives based on weaknesses improvement and counteracting threats
- objectives based on the strengths and counteracting threats.

The problem tree analyse is also a useful technique to formulate specific objectives and strategic actions. This analysis includes:
- the translation of the negative situations in the problem tree into positive and achievable states (the objectives) for example, “low production” is converted into “improved production”;
- the effects will be translated in objectives; the causes will be converted into actions;
- visualization of means-end relationships in a diagram;
- identification of the different possible groups of objectives contributing to a higher objective (clustering).

Diagram of objectives



2.2. Analysing the objectives’ consistency with other strategies and plans

The specific objectives, formulated for the marine spatial plan, will be assessed in relation to the objectives of other spatial plans and strategies (e.g. county spatial plans, regional development strategies, etc.), and sectorial programs (e.g. fisheries, transport programs). The MSP objectives must be consistent with other plans and strategies in order to avoid overlapping with other sectorial objectives or inconsistencies with upper level objectives.

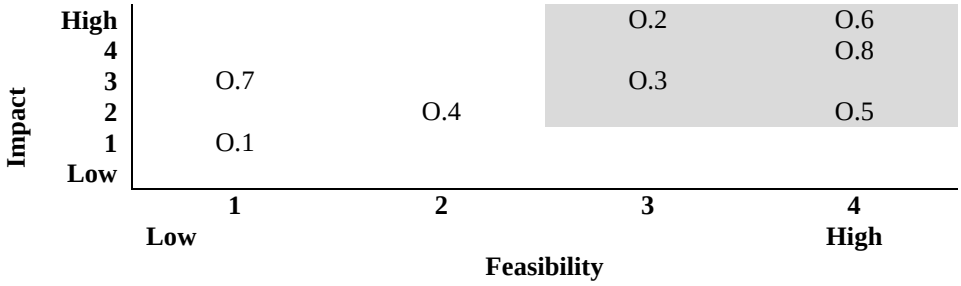
2.3. Development of the action plan for MSP

This step is meant to establish the possible management actions (interventions to achieve the objectives, as future situations) in accordance with the goals and previously stated specific objectives.

Achieving goals and objectives shall be subject to undertaking suitable interventions, called **management actions**. An objective corresponds to at least one action, but there could be several actions envisaged to accomplish an objective (see diagram of objectives), which are called directions of action.
The directions of action are higher-ranking measures, which are in fact sets of actions for the practical achievement of goals, in direct correlation with groups of specific objectives.
There are four categories of management actions as follows:
- actions that specify the **inputs to human activities** (e.g. limitations on fishing activity or capacity)
- actions that specify the nature of the production **process of human activities** (e.g. specification of fishing gear type, mesh size)
- actions that specify the **outputs of human activities** (e.g. limitations on the amount of pollutants discharged to marine environment)
- actions that specify **where and when** types of human activities can occur (e.g. specification of areas closed to fishing or energy development).

2.4. Assessment of the Common Strategic Framework for MSP

Assessment of priorities is an important step in elaboration and development of the strategy.
The following instrument might help the planning team and stakeholders in deciding how to prioritize the specific objectives:



O.1 - O.8 - specific objectives

The most achievable objectives and with the greatest impact, in the given context, should be pursued as priorities.

Specific objectives and directions of action should be related with any substantial collateral impact on marine/coastal environment, which must be prevented, reduced, or compensated as best possible.
Four major sets of criteria will be taken into account in the strategic framework assessment, these are: environment, social, economy and built environment. It should also include assessment of cumulative (cross cutting) effects.
The assessment the spatial plan could also include the examination of cumulative (crosscutting) effects made in relation with a set of criteria. An example of assessment of the action plan could be the following impact matrix:

Criteria on domains/ subdomains		Specific objectives												
		O1				O2			….			On		
		Actions												
		a1.1	a1.2	a1.3	a1.3	a2.1	a2.2	a2.3				an.1	an.2	an.3
Environ-ment	E1													
	E2													
	E3													
Socio-demo-	S1													
	S2													

graphy	S3													
Economy	Ec1													
	Ec2													
	Ec3													
External (land - sea, EEZ)	B1													
	B2													
	B3													
Total														

Criteria (e.g.): Environment: E1- natural areas protection, E2 - natural resources, etc., Socio-demography: S1 - employment in marine activities, S2 - households' revenues, etc., Economy: E1 - economic diversity, E2 - turnover growth, etc., Built environment: B1 - built up area dynamics, B2 - environment protection, B3 - pollution treatment, etc.

In this manner, the effects on other domains of the MSP might be assessed by including them in the following categories:

- strong positive influence (++)
- positive influence (+)
- no influence (0), or both positive and negative influence (+/-)
- negative influence (-)
- strong negative influence (--)

The assessment will shed light on the consequences of the planned actions, other than those represented by the specific objectives. The most benefic and effective actions will be preferred for the objectives implementation. Alternatives for the ineffective actions could be formulated, and evaluated.

Another appraisal process of the marine strategic framework is the **Strategic Environmental Assessment** (SEA) procedure. SEA is an instrument that ensures that developers optimize their plans and make them most beneficial for environment and human health; while, if the full safety cannot be achieved, the potential hazards shall be thoroughly described, and the information shall be provided to the decision-makers, in order to allow them consider expected risks and benefits.

2.5 Assessment of common objectives present in the cross-border area

The step aims at assessing the strategic framework in order to identify the common objectives present in the two countries, which could improve the future situation of the marine area by producing a combined effect, or collaboration. These objectives must be considered with priority, according to their significance, recommended and dealt consequently.

Inputs:

- goals for the cross-border coastal and marine area, the SWOT analysis, the problem tree analysis
- specific objectives for sectorial areas, prioritized, and their correspondent actions intended for implementation.
- indicators for evaluating the specific objectives

Outputs: The Common Strategic Framework for MSP: objectives and action plan, (interventions/management actions and directions of action ordered by priority), related to authorities in charge for implementation.

The Management intent for MSP implementation - a narrative that more fully describes the directions of action and priorities, or their rationale that helps to envision the desired situation of a particular area.

References: UNESCO, Intergovernmental Oceanographic Commission (2009), Marine Spatial Planning. A step-by-step Approach toward Ecosystem-based Management

NOAA Science Advisory Board (2011), *Strategic Advice on Designing and Implementing Coastal and Marine Spatial Plans*, A Report from the NOAA Science Advisory Board, pp. 71 - 82.

Task 3: Stakeholders consultation - approval of the strategic objectives and action plan by stakeholders (setting the basis for the cooperation framework)
Applies to component:
1.2.1. Setting out the institutional framework for cooperation in cross-border MSP
1.2.3. Common strategic framework for maritime spatial planning in Romania and Bulgaria;
1.2.4. Elaboration of a maritime spatial plan for the cross-border area (Mangalia - Shabla);

Task purpose: dissemination of the proposed plan in order to obtain stakeholders' approval for the common strategic framework of the cross-border marine space.

Methodological steps:
3.1. Dissemination of the proposed action plan (objectives and measures) to the institutional framework for approval and observations, or possible suggestions for alternative actions.
The stakeholders will be prompted to provide feedback as a means for collecting information about their opinions on the action plan. The dissemination and communication are essential for the action plan implementation in order to get feedback from stakeholders and to receive possible alternative development measures.

3.2. Reviewing the action plan as a result of stakeholders' observations and suggestions.
Iterative interdisciplinary and participatory filtering of the plan objectives and actions will have an inherent effect in its approval. However, to be effective, the integrated policy document must be submitted and approved by the competent institutions and related organizations.
The final version of the spatial plan will be submitted for approval to the competent institutional framework involved.

3.3. Stakeholders' approval of the final version of the common strategic framework, according to the comments and observations made by the institutional framework involved.
After the approval, the stakeholders will confirm their availability for achieving the strategic objectives and management actions.

Inputs: - the maritime spatial action plan and objectives and management intent description
- list of stakeholders involved in the management actions

Outputs: - the final version of the maritime spatial plan, approved by the stakeholders;
- the commitment of the institutional framework for cooperation in spatial planning of the cross-border area Romania-Bulgaria.

The results of **phase III** will include:
- a common strategy of MSP for Romanian and Bulgarian cross border area
- delivery of model maritime spatial plan produced - principles, vision and common objectives for Romania and Bulgaria
- description of specific needs and challenges of the MPS process in the cross-border area
- recommendations for set-up of MSP in the cross-border area Mangalia - Shabla
- a cooperation framework and institutional setup for cross-border cooperation between Romania and Bulgaria, expandable to other Black Sea countries
- an accurate description of procedural strategic steps followed within the development of cross-border MSP
- a consistent and lasting mechanism to ensure cross-border planning at sea-basin level
- an improved capacity for the implementation of MSP directive in Romania and Bulgaria

- maps presenting the common strategic framework for marine development in the cross-border area Romania - Bulgaria, regarding the main domains considered.

Phase IV. Setting the monitoring framework

Task 1: Creation of a common spatial data base for marine areas in Romania and Bulgaria
Applies to component: 1.3.1 - Creation of a common spatial data base for marine areas in Romania and Bulgaria

Task purpose: to develop the spatial database for the cross-border area Romania –Bulgaria to be employed in maritime spatial planning.

Methodological steps
The development of the spatial database for the marine cross-border area Bulgaria - Romania involves the following steps:

1.1 Selection of a common set of indicators, in evolution, for all significant marine and coastal areas, considered by the spatial plan. The chosen indicators must be obtainable in **time series**, for the same periods and in both countries. The spatial database will include mandatory the following data sets:
- topography (coastline and bathymetry);
- physical data (temperature, salinity, winds, waves, etc.);
- coastal settlements, and economic activities that affects the maritime area (including population data);
- navigation corridors;
- protected areas, biodiversity (habitats and species), ecological processes;
- functional economic areas (navigation, fishing, mineral extraction, etc.) in accordance with the domains studied in phase I of the planning process.

The marine spatial database should be organized in at least four categories of indicators:
a. **Ecological** or environmental indicators reflect trends in the characteristics of the marine and coastal environment. They are descriptive in nature if they describe the state of the environment in relation to a particular issue, (e.g., eutrophication, loss of biodiversity or overfishing);
b. **Economic** indicators reveal the level of economic activity in coastal and marine areas; they are an essential element in the development of MSP plans;
c. **Socio-demographic** indicators reflect the state of the human component of coastal areas, the quality of life in coastal areas, as well as in the sustainable socio-economic benefits;
d. **Built environment** indicators measure the action and characteristics of the coastal built environment in order to identify the urbanization processes and technical infrastructures developments affecting the marine areas.

The spatial database can keep also records on each significant stakeholder responsible or involved in activities in the area.
The indicators for the common spatial database should have the following characteristics:
- Relevance to the plan **objectives** and actions plan;
- Readily measurable on **time scales** needed to support planning in both countries;
- Obtainable: indicators should be easy to obtain since planning resources are usually limited;
- Concrete: indicators should be directly **observable and measurable**, rather than reflecting abstract properties;
- Grounded on **scientific** theory: they should be based on well accepted scientific theory;
- Interpretable: indicators should reflect **aspects of concern** to stakeholders and their meaning should be understood by as wide a range of stakeholders as possible;

- Responsive: they should be able to **measure the effects of spatial processes** in the area, so as to provide rapid and reliable feedback on the consequences of management actions;
- Specific: indicators should **respond to the aspects** they are intended to measure and have the ability to distinguish the effects of other factors from the observed responses.

1.2 Establishing the data sources and formats; if significant indicators are not available, arrangements must be undertaken to get them by other means: surveys, measurements, interviews, documents, studies, etc.

1.3 Developing the information system, both in terms of hardware and software;

1.4 Implementation of the cartographic support of the Romania-Bulgaria cross-border area;
GIS geographic data required for spatial plans should have the following technical properties:
- Relevant coordinate system (WGS 84 recommended)
- ESRI - Data format (ESRI Geodatabase or ESRI Shapefile)
- Convention on xBase file format
- ArcGIS software (recommended).
- The spatial database RO-BG cross border area, produced in ArcGIS system, must comply with all GIS topology rules: no overlapping data; no duplicated data.

1.5 Establishing the entities responsible for implementing the spatial database.
The common spatial data base will be developed by a team of specialists which should be dimensioned according to the extent of the processed data. The team should have the structure and the technical capacity which enable it to deal with collecting and processing the indicators needed for the common spatial data base.

Inputs: indicators selected from those used in the previous phases - Current situation analysis of the cross-border maritime and coastal areas and Strategy formulation – consistent with the criteria above mentioned criteria.
Outputs: the common spatial database
References: UNESCO, Intergovernmental Oceanographic Commission (2009), A Guide to Evaluating Marine Spatial Plans, pp. 37-42
Pomeroy, Parks and Watson (2004), How Is Your MPA Doing?
Belfiore et al. (2006), A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management.

Task 2: Defining the indicators to be monitored and monitoring procedures
Applies to component: 1.3.2. Defining the indicators to be monitored and monitoring procedures.
Task purpose: to give the methodological guidelines for the selection of indicators needed to characterize the plan outcomes and for the performance measurement procedures.

Methodological steps:
2.1. Defining the indicators to be monitored
Each objective and management action should have at least one indicator or set of indicators used to measure and evaluate its **performance** over time.

The indicators to be monitored are intended to respond to four simple questions:
- What resources were being spent for each strategic action? - **inputs** indicators
- What results were obtained from each strategic action? - **outputs** indicators
- What was the evolution of the subject area of the strategic action? - **process** indicators
- What was the effect of the strategic action in the area? - **outcomes** indicators

2.2. Establishing the monitoring procedures

The usual **monitoring procedures** include the following steps:

2.2.1. Identifying the prerequisites for performance monitoring

The step will establish the needs for monitoring and evaluation of the marine areas and determine who wants the results that evaluation can provide (administrations, professional communities, NGOs, institutions). At this stage the monitoring and evaluation team must be established in relation with the specificities of the plan strategy. The monitoring team could consist of:

- members of the MSP professional staff
- representatives of agencies responsible for MSP and authorities in charge
- measurement experts, either from one of the agencies responsible for MSP
- outside contractors, preferably familiar with the MSP
- information-processing expert

2.2.2. Developing the data evaluation plan

A time frame for the plan results evaluation should be established. The evaluation plan will link the time frame for performance evaluation (evaluation periods) with a system of targets and interim targets which measure the management actions success over time.

Establishing a schedule of monitoring activities is based on the analysis of the specific objectives and plan actions. The accomplishment of objectives and plan actions take different periods of time (e.g. building a dyke vs. restoring a biologically damaged area) which must be foreseen by the monitoring plan.

2.2.3. Identifying indicators and targets of performance for marine spatial management actions

A common set of indicators will be selected in order to measure the completion of the objectives and management actions developed within the common strategic framework. Each objective and management action must be measured by at least one indicator.

Targets will be determined as incremental steps toward a foreseen objective or completed managerial action.

A target is an interim point on the way to a long-term management objective. Targets setting is based on known resources, employed to achieve an objective, over a specified period of time.

2.2.4. Establishing a baseline for selected indicators

A baseline is the situation before a marine spatial management plan begins; it is the starting point for performance monitoring and evaluation of each performance indicator. Monitoring is a process of periodically assessment of specific objectives achievement against the established baseline.

2.2.5. Collecting data on marine system for plan evaluation, this includes the steps:

- Collecting data on plan objectives and actions
- Summarize data
- Use tools to keep track
- Store data

2.2.6. Analysing and interpreting the data in order to organize the information that is reported and to establish its potential use. This is a critical step of the plan evaluation which comprises the following steps:

- analyse the data
- interpret the data
- share and review information

Performance data will be interpreted after beginning the implementation of the marine spatial plan through evaluation of indicators against the baseline.

2.2.7. Preparing the evaluation report. An evaluation report should be prepared at the final of each period of evaluation and at the end of the monitoring phase (end of plan cycle).
The evaluation report should contain the following components, usually divided into four chapters: introduction, description of the evaluation findings, conclusions, recommendations.

2.2.8. Communicating the results of the performance evaluation
An efficient communication of the performance evaluation will follow some rules:
- making timely and frequent contact with stakeholders in order to communicate monitoring results after each evaluation period;
- communication formats must be personalized to what the audience needs to know;
- a variety of reporting formats helps ensure understanding;
- written formats such as reports, executive summaries and fact sheets must be clear and include visuals to quickly communicate information and findings;
- quantitative data should be presented alongside qualitative data.
- recommendations for adapting the management plan should be ranked, concrete, specific, and feasible.

Outputs: - a list of relevant indicators to be monitored in the Romania – Bulgaria maritime and coastal cross-border area;
- a set of guidelines describing the steps to be followed in the monitoring procedures.

References: UNESCO, Intergovernmental Oceanographic Commission (2009), A Guide to Evaluating Marine Spatial Plans.
Pomeroy, Parks and Watson (2004), How Is Your MPA Doing?
Belfiore et al. (2006), A Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management.

Task 3: Creation of a data sharing centre supporting the cross-border maritime spatial planning activities
Applies to component: 1.3.3. Creation of a data sharing centre supporting the cross-border maritime spatial planning activities
Task purpose: to identify the guiding lines for organizing a body meant to facilitate the information exchange between the two countries, in supporting the process of marine spatial planning in the Black Sea areas.

Methodological steps:
3.1. Acquisition of equipment required to implement the spatial database and monitoring the cross-border marine areas;
3.2. Training the personnel who will use the software applications on specific tasks, required by cross-border marine spatial planning;
3.3. Establish the management program for the formation and exploitation of the common data base and cross-border maritime spatial planning activities:
- Inventory of data sources,
- Data collection/exchange,
- Data organization,
- Updating data
- Verification and validation of indicators;
- Data processing

3.4. Collection of the critical indicators and formation of the common data base;
3.5. Informing the stakeholders regarding the functions of the center and encourage their participation in data exchange;
3.6. Exploitation of the database as an integrated tool for spatial analysis in support of the MSP;

3.7. Communication to decision makers, planning professionals and stakeholders.
The significant stakeholders will be informed on the results achieved in the planning and monitoring process.

Inputs: - information on best practices regarding data sharing
- equipment and personnel required for operating the data sharing centre
- data bases for analyses of the cross-border marine area and monitoring the MSP
Outputs: - operational equipment and materials for data processing and sharing
- trained personnel for data processing and communication
- the management program
- geoportal for data sharing
References: UNESCO, Intergovernmental Oceanographic Commission (2009), A Guide to Evaluating Marine Spatial Plans.

The results of **phase IV** will include:
- preparation of monitoring the implementation of EP and EC Directive 89/2014 establishing a framework for MSP in Black Sea countries
- improvement of exchange of data and information related to maritime area between Romania and Bulgaria, as well as with other Black Sea countries
- improvement of stakeholders and public access to maritime data and information
- a concept for a suitable monitoring and evaluation process
- indicators and procedures defined for monitoring of MSP implementation in the Black Sea cross-border area
- a lasting mechanism to exchange information between Romania and Bulgaria and Member States

Outputs of component 1.2.2, as established in the Grant Agreement, are:
- Common methodology for analysing MSP- detailed description of the phases of the MSP
- Description of the determined methodology
- Rationale and description of selection process for the project area of the MSP
- Evaluation of MSP best practices in the border area

Annex 1

The rationale and description of the selection process for chosen sea area

Rationale and description of delimitation process for the project area of the MSP

Defining the planning areas

According to Directive of the European Parliament and the Council regarding establishing a framework for maritime spatial planning and integrated coastal management SWD 2013, the main purpose of maritime spatial planning is to identify and manage spatial uses and conflicts in maritime areas.

The geographical scope – coastal and marine waters.

According to art. 3 (1) (a, b) of Marine Strategy Framework Directive (2008/56), "Marine waters" means: waters, the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters is measured extending to the outmost reach of the area where a Member State has and/or exercises jurisdictional rights, in accordance with the UNCLOSs). Coastal waters as defined by Directive 2000/60/EC, their seabed and their subsoil, in so far as particular aspects of the environmental status of the marine environment are not already addressed through that Directive or other Community legislation.

But, the best practices for MSP to identify boundaries are:

- The coastal boundary should be the farthest extent of saltwater influence or head of tide.
- The alongshore boundaries should weigh ecological, social, and jurisdictional considerations. These boundaries are less critical if adjoining plans are done consistently.
- Consider using an existing jurisdictional boundary as the offshore edge of the planning area and adjusting if necessary for consistency in human uses and ecological features.

Decisions about the geographic scope or scale (i.e., complete size of the planning area) and resolution (i.e., the size of planning units such as grid cells) are critical for effective planning.

- Marine spatial plans should consider information at two scales and resolutions: (a) a 'state' scale with relatively fine resolution and (b) a regional scale with coarser resolution.
- Awareness of the scale and resolution of different data sets; maintain their utility by avoiding improperly scaling them up or down.

Another factor specific to coasts and seas is the complexity of land-sea interactions/ pressures. Often, this focuses on the effects of land-based activities on the sea, but the reverse needs to be considered as well. Examples for the former include pollution from agricultural run-off which is carried into the sea from entire river catchments or the loss of productivity of coastal waters because coastal wetlands are lost. Examples of the latter include the economic dependence of inland communities on marine resources or the fact that fish might spend their adult lives at sea but depend on healthy rivers to spawn. UNEP estimates that 80% of the pollution load in the oceans originates from land based activities and concludes that human activities on land represent the main threat to the health, productivity and biodiversity of the marine environment. Land-sea interactions exist at many different scales and with different degrees of intensity, with their precise expression strongly dependent on their respective systems context. This too has long been recognized by managers and policy-makers, with integrated approaches called for that view land and sea as a continuum and overcome traditional administrative divisions.

Political considerations

Current European trends in policy and planning with pressures and impacts on sea use are:

Growing interest in offshore technologies such as carbon capture, geological storage, methane hydrates or hydrogen capture and storage;
Targets for reducing carbon emissions and becoming less energy-dependent by developing sources of renewable energy, such as offshore wind, ocean currents, waves and tidal movements;
A drive to enhance Europe's innovative capacity and export base through blue biotechnology and new products that can be obtained through the exploitation of marine biodiversity;
A tendency for industries to cluster together in order to make best use of synergies;
Increased awareness in spatial planning of natural risks such as erosion, coastal flooding, storms and tsunamis;

Implementing international policies such as European Directives
New forms of governance are likely to emerge as a response to changing societies and political contexts. MSP is likely to be a tool of coastal and marine governance, and may need to develop processes to ensure wide-ranging participation of stakeholders and transparency. It may also need to develop new ways for taking into account 'intangibles' when it comes to decisions on the future of the coastal and marine environment.
Governance indicators that are important in measuring successful MSP management actions include:
• An appropriate legal authority (e.g., the establishment of MSP legislation or order);
• Appropriate institutional arrangements, such as a lead agency and a MSP coordinating body;
• Clear geographical boundaries of the MSP plan;
• A specified planning horizon for the plan, e.g., a 10-year plan;
• A clear deadline for the completion of the plan;
• A specified time frame for reviewing the plan, e.g., every five years;
• Regulatory powers and instruments for managing development within the marine management area;
• Human, technical and financial resources to develop and implement the plan;
• Procedures in place for monitoring, evaluating and adjusting the MSP plan.
A summary of key MSP characteristics is:
- a comprehensive systems approach. This is one step up from the ecosystems approach and sets out to implement a vision of sustainable development.
- principles of polyculture, openness and integration and sustainable development.
- the question of scale. Large-scale fast-developing uses need different consideration than smaller-scale pressures that develop slowly.
- the sea is a three-dimensional environment. This poses different constraints on marine resource management, but also provides opportunities in terms of multiple use of the same space. Impacts always need to be considered as part of this three dimensional environment, in particular as far as cumulative impacts are concerned.
- the land-sea interactions. This must include the pressures/ impacts of marine resource use on land and vice versa, as one cannot be separated from the other.
- international solutions. MSP cannot be dealt with by one nation alone. The sea knows no boundaries when it comes to mobile species or pollution.
- account of different regional realities. The ecological characteristics of Europe's coastal waters and the structure and intensity of the maritime activities, which take place on them, vary widely between the Baltic, the Mediterranean, the Atlantic and the North Sea, and the Black Sea.
- account of political realities in the respective implementing countries. Rather than being imposed from outside, MSP should be allowed to take on different forms in different contexts, without however neglecting the basic principles.

Knowledge needs

A particular difficulty lies in the continuous nature of the marine environment and the sheer scale of marine ecosystems. Familiar concepts such as borders or even ecological boundaries are more difficult to apply than on land, not least because of the three-dimensional nature of the sea. Although some habitats may be readily delineated, many shift and change over time and with seasons. Most marine systems are easily influenced by external factors that originate elsewhere, sometimes at considerable distances. Water quality is one of the most obvious examples; others might be increases in turbidity or changes in salinity as a result of human activity. There is also the issue of high species mobility, which places limits on tools such as marine nature reserves. Policymakers thus tend to agree that the sustainable management of the marine environment requires international co-operation. This must include countries not directly adjoining the coast but still impacting the sea through their activities, for instance through large river catchments. This has been recently stated in EU policy: “Oceans and seas cannot be managed without cooperation with third countries and in a multilateral form. EU policy aimed at the oceans must be developed within that international context“(CEC 2006). A good example of EU policy is Marine Strategy Framework Directive (see art.6 (2).

Ecological and biological characteristics

A range of legal instruments and policies at international and European level recommend the establishment of large-scale MPA networks. The World Summit on Sustain able Development in 2002 and the Parties to the Convention on Bio-logical Diversity have made international commitments to establish a global system of representative MPA networks by 2012. Both OSPAR and HELCOM have adopted recommendations for the creation of networks of MPAs, including a joint declaration aimed at establishing ecologically coherent and well-managed MPA networks. Within the EU, networks of protected areas are being established as part of the Natura 2000 network and the Emerald network. The objective of the Natura 2000 network is to protect the most seriously threatened habitats and species in the EU, under the legal basis of the EU Habitats and Birds Directives. The EU Habitats Directive for the establishment of important high-quality sites will make a significant contribution to conserving habitat types or plant and animal species identified to be most in need of conservation within Europe, as listed in Annexes 1 and 2 of the Directive. This is done by the designation of Special Areas of Conservation (SACs). The EU Birds Directive enables the classification of sites as Special Protection Areas (SPAs) and bird species for which special protection measures must be taken are listed within Annex I of the directive. The SACs and SPAs will jointly form the Natura 2000 sites. The designation of marine SACs is however still in progress, a delay caused by uncertainties regarding whether the Habitats Directive covers only the 12–nm territorial waters or extends to the 200 nm border of the EEZ. This has now been resolved by a decision that the EEZ is covered, so the process of designating marine SACs is again underway. In addition, the Council of Europe has established the Emerald network of Areas of Special Conservation Interest as part of work under the Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats). The network of Emerald sites is based on the same principles as Natura 2000.

Some places in the sea have much greater importance than others for particular species, ecosystems, or processes and, hence, for humans too. ‘Real estate values’ in the sea vary enormously, just as they do on land. Knowing which places are most important to conserve and which places are compatible with development is central to the art of MSP.

An important task is the identification and mapping of “ecologically or biologically significant” areas. Scientific criteria can be used to identify important biological and ecological areas that need special protection.

Various definitions of marine biological or ecological value exist. The term ‘value’ is always linked to the objectives driving the valuation process (e.g. conservation, sustainable use) and

almost always refers to the socio-economic value of an ecosystem (i.e., the value of goods and services provided by marine ecosystems, or the value of an area in terms of its importance to human use).

Activity levels

The elements of economic activities involved in the delimitation of spatial plan areas should include at least the following processes:

- The exploitation of coastal and marine resources has contributed much to shaping national interest areas.
- Fishing, shipping, international trade, the exploitation of oil and gas and tourism are examples of established sectors that are developed over decades and shape the management areas.
- Other uses have begun to be added to the mix. Sectors such as renewable energy generation and aquaculture have grown in intensity as countries push for economic growth.

Administrative issues

The most important challenge for MSP is to explicitly consider multiple management objectives (e.g., energy production, environmental conservation, fishery production, maritime transport) and areas. Consideration of explicit trade-offs among objectives and examination of alternative scenarios for meeting the newest and most rapidly developing areas in planning are:

- A high-level government mandate is a necessary but not a sufficient requirement for successful development and implementation of MSP.
- Facilitate local, bottom-up involvement of diverse stakeholders in MSP.
- Ensure that the burden of proof about human impacts is distributed appropriately among groups with differing objectives.
- Conduct formal, rigorous cost-benefit analyses for management alternatives.
- Explicitly identify and quantify tradeoffs among objectives, while highlighting opportunities for reaching common ground among stakeholders.
- Develop forward-looking scenarios to explore management alternatives.
- Planning frameworks need to deliver certainty in the short term but reasonable flexibility in the long term to adapt to changing conditions and priorities.
- Focus the planning effort on the few, overarching management objectives first and then on more detailed consideration of the many human uses of the ocean.
- Develop an integrated plan that addresses multiple management objectives.
- For plans that are intended to inform zoning, it helps to identify the likely types of and number of zones; fewer is better for planning.

Just like a land use plan, a sea use plan (or marine spatial plan) would in essence set out a vision for a defined marine area. It would identify potential sites for appropriate development and uses, those in which development or activities should be managed or restricted, areas where important assets need to be protected, and where there should be a presumption against development or uses.

Conclusion

MSP is applied to the **territorial waters zone** of Romania and Bulgaria (12 nautical miles, 22,2 km), the planning process being performed only for this area and the **coastal cross-border area** including the **basic administrative units** (NUTS 4 in Romania and municipalities in Bulgaria) **neighboring the shoreline** (see list above).

List of basic administrative units included in the MSP area

Municipalities of Bulgarian Black Sea coastline

Burgas Province (Oblast)

1. Burgas (main town: Burgas)
2. Nesebar (main town: Nesebar)

3. Pomorie (main town: Pomorie)
4. Primorsko (main town: Primorsko)
5. Sozopol (main town: Sozopol)
6. Tsarevo (main town: Tsarevo)

Dobrich Province (Oblast)

1. Balchik (main town: Balchik)
2. Kavarna (main town: Kavarna)
3. Shabla (main town: Shabla)

Varna Province (Oblast)

1. Aksakovo (main town: Aksakovo)
2. Avren (main village: Avren)
3. Byala (main town: Byala)
4. Dolni Chiflik (main town: Dolni Chiflik)
5. Varna (main town: Varna)

Municipalities of Romanian Black Sea coastline

Tulcea county

1. C.A. Rosetti
2. Sulina
3. Sfantu Gheorghe
4. Murighiol
5. Jurilovca
6. Sarchioi
7. Ceamurlia de Jos

Constanta county

1. Mihai Viteazu
2. Istria
3. Corbu
4. o. Navodari
5. m. Constanta
6. Agigea
7. o. Techirghiol
8. o. Eforie
9. Tuzla
10. Costinesti
11. 23 August
12. m. Mangalia
13. Limanu

Annex 2

MSP best practices in the cross-border area - methodological aspects

Planning process design

1. **The Norway's methodology** and experience related to the elaboration of Integrated Marine Management Plans presents key features based on the knowledge, ecosystem studies, cross-sectorial cooperation and international cooperation.

The scientific basis (2008-2010) of the management plan includes the description of the environment and resources (including particularly valuable areas), status reports from industries and report on social and economic conditions. For the impact assessment are evaluated several sectors such as: petroleum extraction activities, renewable energy production, fisheries and aquaculture, shipping, land-based and coastal activities and external pressures (long-range pollution, climate change, ocean acidification, alien species) (Petersen, 2014).

The synthesis report contain information about cumulative environmental effects, vulnerability of particularly valuable areas, conflicting interests and the need for coordination, proposed indicators for a monitoring programme, analysis of population, economic activity and ecosystem services and priority knowledge needs. The main political phases/processes include: a) scientific basis delivered to ministers/steering committee – political phase start; b) open consultation (including here the stakeholder conference etc.); c) writing of White paper coordinated by Ministry of the Environment; d) Interdepartmental consultation; e) Government discussions and political decisions; g) White paper presented by Government (MoE) to Parliament; h) Parliamentary process endorsement of White paper (i.e. The Management plan) (Petersen, 2014).

The ecosystem-based approach involves the analysis of biological sustainability (human activity that should not threaten sustainability, cumulative effects and monitoring), economical sustainability (economic activity in marine areas integral part of the economy, marine areas provide 50% of total export and represent 30% of national GDP) and social sustainability (eco-system services, employment and leisure) (Petersen, 2014).

Source:

Petersen D.E. (2014), *Integrated Marine Management Plans. Norway's methodology and experience*, Norwegian Environment Agency, 7 November 2014, http://hotsite.mma.gov.br/jornada-gerco/wp-content/uploads/sites/10/2014/11/Integrated-Marine-Management-Plans-Methodology-and-experience-November-2014-clean.pdf

2. *The „Methodological handbook on Maritime Spatial Planning in the Adriatic Sea"* is structured on eight methodological steps which focus on relevant aspects at the basin scale, but does not simple constitute a linear process; feedback loops can be built into the process, linking different steps.

Step 1 – Starting the process and getting organized

This step includes all the issues that need to be clarified and organized before the real planning process. Then it is essential to identify the overall objectives and the expected results, as well the identification of the authorities that have the interest and responsibility in MSP and must be involved in MSP's design and implementation.

Step 2 – Assessing the context and defining the overall framework for MSP

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). A 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.

Step 3 – Analysing existing conditions

This step 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. 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). The analysis must also identify compatibilities among marine uses and between those uses and the environment, spatial incompatibilities determined by sea-land interactions.

Step 4 - Analysing future conditions

This step activity can initially focus on the analysis of current trends of needs of existing marine human uses and their projections into the future. Particularly important is the analysis of already existing integrated and sector policy and plans, defining strategic and specific objectives as well as concrete actions for the future evolution of the marine area.

Step 5 - Elaborating the Maritime Spatial Plan

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 minimize environmental impacts. The elaboration of the maritime spatial plan must be run in parallel with the assessment of its environmental effects.

Step 6 - Adopting the Plan and organizing implementation

Although this is not responsibility of spatial planners, it is a critical step to give concreteness and credibility to the whole process, and reach the expected benefits. Experts involved in the plan design can facilitate the implementation through various organizing actions, i.e.: identify implementation authorities, technically support the implementation authorities, provide technical support to vertical and horizontal coordination mechanisms put in place to implement the plan, dissemination of the maritime spatial plan and expected benefits to a stakeholder arena wider than the one involved in the process.

Step 7 - Monitoring the Plan

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. A particular attention should be given to assess stakeholders' satisfaction in relation to their involvement in the MSP process.

Step 8 - Adapting the Plan

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.

Source:

Methodological handbook on Maritime Spatial Planning in the Adriatic Sea, MSP step-by-step in the Adriatic Sea.

3. Marine Spatial Policy Plan for Israel's Territorial Waters. The Approach and Method

The methodological process of preparing the Marine Spatial Policy Plan is structured in seven stages. The stage structure allows for a rigorous planning process but is by no means progresses sequentially. The process calls for broad overlaps of parallel stages (Portman et al., 2013).

Stage A – Collecting and analyzing data & developing methodologies

The collecting of information will include: surveying and mapping; identifying information gaps; diagnostic of different space uses and their environmental interactions; completion of missing knowledge; considering information sources that come from the field (Bottom-up approach); Assessing cumulative impacts to the marine environment; tapping into other ongoing, information-gathering processes whenever possible.

Stage B - Definition of a vision, goals and objectives

The vision is based on an extensive disciplinary and participatory process. The process seeks to integrate all stakeholders to reach a broad base of consensus based on shared values. This would allow reaching consensus about desired goals expressed as a vision.

Stage C - Preparation of planning policy alternatives and P-GIS tool

Planning alternatives will be formulated. The alternatives will address the various issues raised during the previous step and considered essential parts of the vision. The alternatives will be specified as ecosystem based management principles and in spatial and temporal terms.

Stage D – Consolidation of a selected alternative (A Roadmap)

The selected Roadmap should provide a comprehensive response to the vision stated and to the goals and objectives formulated in stage B. The Roadmap, through its multidisciplinary analyses and the participatory processes, would combine top down and bottom-up approaches.

Stage E – Preparation of the policy plan

The policy plan will detail the roadmap and develop it into an implementable set of guidelines and an operational apparatus. The Policy Plan will consolidate decision making and management tools and will reflect data and perspectives (stakeholder needs, uses and perceptions) of marine environment and will also suggest ways of continuous cooperation and coordination among the various stakeholders.

Stage F- Adoption and Dissemination

At this stage the main effort will go towards the adoption of the MSP Action Plan by government agencies. The dissemination process is essential to the implementation of the Policy Plan developed. This stage of the process will make use of the digital on-line PPGIS tool for informing the public and collecting evolving information about the marine environment and for stakeholder/public input.

Stage G- Set up an implementation and a monitoring process.

The publicizing and dissemination processes are not intended to be final and time-constrained. The process described in Stages A-F will usher a better management of the marine environment and incorporate digital tools that are accessible to the public and will enable effective monitoring of the marine environment according to measurable indicators - social, economic and environmental.

Source:

Portman et al. (2013), Marine Spatial Policy Plan for Israel’s Territorial Waters & Exclusive Economic Zone of the Mediterranean Sea, The Center for Urban and Regional Studies The Faculty of Architecture and Town Planning Submitted to Yad Hanadiv, June 2013

Data collection

Marine Spatial Planning: Ecosystem-based zoning methodology for marine management in South Australia

The first step in the development of a marine plan involves a process of data identification, collection, collation, and the creation of a series of maps depicting economic, social and cultural values of the planning area. As far as planning the marine zones using Geographic Information Systems (GIS), one model is the zoning methodology which was developed within the planning framework for all South Australian marine ecosystems and which groups amounts of known habitats and species into four ecologically rated zones, derived from known ecological criteria (Day et al., 2007). This methodology integrates data collected on the environmental, economic, social and cultural values of the marine ecosystems using a wide range of sources like community and expert knowledge, data provided by governmental agencies and private businesses. Once data were collected on specific fields, it is compiled in GIS spatial layers.

Moreover, the pilot area of Spencer Gulf in South Australia comes as an example of gathering and analyzing data using grid cells of equal size which are referred to as planning units. The ecological factors underlying the ecosystem-based zoning methodology were grouped as habitats (including data on the presence of reef, sea grass meadows, soft sediment communities, mangrove forests, and saltmarsh) or uniqueness (including data on migratory water birds and shorebird breeding/roosting sites, fish spawning and nursery areas, endemic species, rare and endangered species). All these data were computed based on the natural grouping method that relies on Jenks optimization statistical formula. However, the natural breaks method uses a large amount of data layers. As data are lacking in many marine planning areas, the natural breaks method used in the GIS analysis may not present the best distribution of the data and therefore other models may need to be tested, particularly in the case of other marine areas.

Source:

Day V., Paxinos R., Emmett J., Wright A., Goecker M. (2007), *The Marine Planning Framework for South Australia: a new ecosystem-based zoning policy for marine management*, Marine Policy 32(4):535-543.

Paxinos R., Wright A., Day V., Emmett J., Frankiewicz D., Goecker M. (2007), *Marine spatial planning: ecosystem-based zoning methodology for marine management in South Australia*, Journal of Conservation Planning 4:37-59.

Analysis /diagnosis

The aim of the **TPEA project** was to demonstrate approaches to trans-boundary maritime spatial planning (MSP) in the European Atlantic region. This is one of a series of projects exploring the opportunities and challenges of carrying out cross-border MSP in Europe's regional seas, making connections with integrated coastal management (ICM).

Understanding the main legal instruments and policy priorities, relevant to maritime activities, for each jurisdiction, at a higher transnational level, is an important aspect of trans-boundary MSP.

A comparison of national legal instruments may highlight differences, but also identify commonalities upon which to build a joint approach. It may also be helpful to identify policy issues, such as strategic objectives, priorities and targets, in relation to such things as port development or aquaculture. Issues may relate to national strategies and priorities or may be shared.

It should be possible to compare priorities, identifying synergies between jurisdictions and any differences that limit a joint approach. This can point towards the need for more detailed discussion on key issues - there may be shared targets that could drive particular developments such as offshore renewable energy or aquaculture, or there may be differing

environmental objectives, impacting on how cross-border resources might be managed - thus, it may indicate future trends for the area.

Identify key coastal and maritime issues. In some contexts, certain land-sea interactions may be regarded as important, and trans-boundary considerations may extend inland, to deal, for example, with land-based sources of pollution. Following an initial analysis, it may be possible to define an area of common interest, where there is greatest potential for developing a shared approach to management and development.

Maritime activities often have consequences beyond borders. Also, trans-boundary dynamics tend to be graded and multi-scalar and vary in their reach according to different environmental conditions and maritime activities. There may also be long-distance influences from beyond the planning area. It may be possible to reflect these dynamics in the analysis of the area.

The potentially large number of organizations involved may be a challenge to understanding the procedures required for coastal and maritime activities. However, attention may be given to mechanisms for communication and consultation, with a view to finding the optimum connections across jurisdictions. It is also useful to understand frameworks of consultation in each territory and possibilities for stakeholder involvement.

Source:

Good Practice Guide, Lessons for cross-border MSP from Trans-boundary Planning in the European Atlantic (TPEA).

Best practice of GIS tools for marine spatial planning and management

Methods / Tools	Area of Interests	Environmental Threats	Data	Result
ArcView Model Builder, Multi Criteria Evaluation (MCE)	Infrastructure		GIS layers	A strategy for land use based on GIS models and expert group decisions.
GIS (Geographic Information System) /Farm models	Infrastructure	Increasing land use		
Remote sensing, GIS	Infrastructure	Land use, Disturbance of species	GIS layers on ecological and threat parameters	Evaluation of reserves; Suggestion for zoning to reduce disturbance
GIS integrated approach (regression models, relative probability model)	Infrastructure	Increased urban growth, Land use change	Satellite images (Landsat TM Imagery), GIS layers, grids of predictor variables, data for variables in models	Time-Series map of predicted urban growth
GIS, DSS (Decision support system)	Infrastructure	Increased urban growth, Land use change	Socio-economic data (population counts, growth rates, economic growth), GIS layers on land use patterns	Simulations of socio-economic and land development scenarios
GIS, GIA (Geographic Information Analysis)	Infrastructure, Nature conservation	Increasing land use	GIS layers on ecological parameters (e.g. sensitive species, habitats) and threat parameters (e.g. protection status, development pressure)	Identifies a greenway network
Remote sensing, GIS, logistic regression	Infrastructure, Nature conservation	Urbanization	AVHRR (Advanced Very High Resolution Radiometer), GIS layers (habitats, topography, infrastructure)	Shows relationship of species distribution, distance to infrastructure
Remote sensing, GIS	Infrastructure, Nature conservation	Expansion of industry, Habitats loss	Aerial photographs, GIS layers on land use, field work (questionnaire)	Identifying habitat destruction due to increase in aquaculture
MARXAN site selection + economic data public submissions	Nature conservation	Insufficient nature conservation	Presence/absence input data	A suggestion on rezoning of a MPA (Marine Protected Area)
GIS	Nature conservation	Habitats loss	Environmental data (e.g. national parks, major streams, major roads)	Populations genetic variation protected, identification of areas where genetic sampling is needed
Remote sensing, GIS	Nature	Decreased diversity due	Satellite images, vegetation	Diversity measures in relation

	conservation	to fragmentation	maps in GIS	to habitat characteristics
UV- video, clustering, GIS	Nature conservation	Lost habitat due to low protection	Habitat maps, areas of different zones in zoning plan	Data for assessment of occurrence of different habitats
Species collection, GIS database	Nature conservation	Insufficient nature conservation	Species presence data	More biological data for planning of protected areas
GIS	Nature conservation	Insufficient nature conservation	GIS data sets	Suggestions of application of Coastal GIS
GIS	Nature conservation	Insufficient nature conservation	Presence data of species, protected areas	Evaluation of conservation status of a species.
GIS	Nature conservation			Application of GIS in Coastal Zone Management
Query of parameters/an overlay of conditions of potential distribution	Nature conservation	Eutrophication affects visibility, Increases filamentous alga	Select areas based on : Soft, sand substrate, depth 0,5-10 m, sheltered-moderately exposed, slope <10 degrees	Substrate type, wave exposure, topography and depth information,
Query of parameters/an overlay of conditions of potential distribution	Nature conservation	Eutrophication affects visibility, Increases filamentous alga	Exposure, depth, substrate, geo-referenced abundance and depth distribution	Models of potential coverage, abundance and depth distribution
GIS	Nature conservation, Military areas	Habitats loss	Land use, vegetation maps, soil condition, slope, areas in military use	Focus on sites with appropriate landscape features for conservation of species/ group
GIS	Nature conservation, Shipping	Loss of vulnerable areas	Maps on valued ecological features (VEF), identification of vulnerable VEF, prediction of VMA with ecological classification	Identification of geographic areas for management and conservation purposes.
GIS	Shipping, Nature conservation	Ship traffic in vulnerable areas (ATBAs) based on biological values	LANDPAR data for vessel tracks	Vessels operating in ATBAs could be identified and notified about the ATBA.
Remote sensing, GIS	Shipping	Increased erosion and changes in vegetation	Data for erosion models, classified vegetation maps	Model of erosion, and NDVI (Normalized Difference Vegetation Index)
GIS	Nature conservation, Socio-economic	Increased urban growth, infrastructure and exploitation of natural resources	Spatial data (biological and socio-economic)	Priority areas for nature conservation
Classification of natural assets visited by tourists, Identification of indicators, management guidelines	Recreation	Vegetation degradation, erosion, decreased biodiversity, effects on species, crowding, pollution, noise, damage	Environmental data (on threats)	Indicators of environmental change due to tourism, Guidelines for management
GIS	Recreation	Vegetation degradation, erosion, decreased biodiversity, effects on species, crowding, pollution, noise, damage	Environmental data (on threats)	Sustainable tourism planning
GIS	Recreation	Vegetation degradation, erosion, decreased biodiversity, effects on species, crowding, pollution, noise, damage	Resource inventory, ecotourism criteria, GIS for ranking of sites	Areas suitable for ecotourism
GIS (based decision support System)	Recreation	Conflicts in land use decisions	GIS data layers,	Strategies identifying conflict in land use planning for tourism
Visitor surveys, indicators	Recreation	Increased negative impact on the natural environment due to tourism	Field data on indicators, visitor surveys	Development of indicators for measuring sustainability of tourism
GIS	Recreation	Loss of habitat, wearing of nature	GIS layers on nature conservation, threatened species, land use, master plans, infrastructure, traffic, outdoor recreation opportunities	Management of visitors flow
GIS (3D-models)	Recreation		Existing walking tracks in GIS, 3D-models, digital aerial photography	Virtual fly-through of existing natural and man-made features, landscape sensitivities, terrain and conservation assessment
GIS	Recreation, Culture	Increased tourism causing negative impacts on nature	GIS data layers on cultural and natural elements	Internet based geographical data service

GIS, multivariate logistic regression model	Recreation, Infrastructure	Increased tourism activities	GIS data layers (building permits, parcel maps, spatial variables for prediction of likelihood of development)	Tools for assessing land use change at local scale (a tourist destination)

Source:
GIS tools for marine spatial planning and management, Annex 1-A literature based summary of GIS tools that may be useful in Marine Spatial Planning, pp.163 - 169

Spatial modelling

Management models:

1. *Baltic NEST decision support system* assesses and describes the response of nutrient and organic matter driving key impacts such as eutrophication within and between of the Baltic Sea. NEST provides the scientific community and decision makers with a combination of modules to carry out scenarios to define required and achievable nutrient load reductions as identified in the Baltic Sea Action Plan. Such scenarios include the development of the agricultural, fishing and shipping sectors within the Baltic Region, as well as ecological feedbacks of increasing pollution loads in comparison to already established ecological objectives and targets. Scenarios on the impact of climate change were considered important.

2. *MARXAN* (MARine spatially eXplicit ANnealing) is a software that provides decision support for systematic conservation planning. The system is designed to find cost efficient suggestions for suitable marine conservation areas which meet a number of ecological, social and economic objectives. In addition to the most cost effective solution, MARXAN provides also the frequency with which each planning unit was selected during the optimizing process and an overview of how good the targets could be met. The results can be further influenced by setting parameters for clustering.

3. *Boundary GIS web application* enables the GIS technology based boundary objects to carry information and context that can be used to translate, transfer and transform knowledge between communities of practice, and to support the negotiations aiming at building coherence between social groups concerned. The Boundary GIS web application is based on the template of ESRI Silverlight Standard Map Application for Visual Studio 2008 Professional. Map layers are developed using ArcGIS Desktop 9.3 and published on the ArcGIS Server 9.3.

Ecosystem models:

1. *ERGOM* was originally designed to reproduce the Baltic Sea nitrogen cycle and as a research tool to describe the ecologic state of the Baltic Sea. ERGOM uses nine state variables (ammonium, nitrate, phosphate, diatoms, flagellates, cyanobacteria, zooplankton, detritus and oxygen) and includes an explicit treatment of sedimentary material in the bottom sediment layer. These state variables describe the biogeochemical processes of photosynthesis, grazing, respiration, mortality, mineralization and de-nitrification in the Baltic Sea ecosystem.

2. *Ecopath with Ecosim* (EwE) is a free mass balance ecological/ecosystem modeling software suite for analyzing matter and energy flows. Ecopath's basic equation represents a mass balance between each trophic group of a system. EwE has hree main components: Ecopath – a steady-state, mass-balanced snapshot of the system; Ecosim – a time-dynamic simulation module for policy exploration; and Ecospace – a spatial and temporal dynamic module primarily designed for exploring impact and placement of protected areas. The Ecopath software package can be used to (1) address ecological questions, (2) evaluate ecosystem effects of fishing, (3) explore management policy options, (4) analyze impact and placement of marine protected areas, (5) predict movement and accumulation of contaminants

and tracers (Ecotracer), (6) model effect of environmental changes. Trophic network modeling has been used as a tool to compare ecosystems by identifying internal relationships critical to their functioning and trophic and development stages. Ecopath software is becoming increasingly popular for food-web modeling. Based on Ecopath simulations, network indices and carbon flows can be derived to quantify energy transfer efficiency through the entire food-web. Comparative network analyses of different ecosystems allow the quantification of important direct and indirect food-web interactions and indicate the impact of human influences (e.g. fisheries).

3. *Spatial modeling into a map-based tool* that allows making spatial planning decisions in shallow coastal water areas, based on scientifically sound data (e.g. HISPARES – Interreg project). Maps showing the distribution of species and habitats are important instruments for an effective spatial planning and management in relation to ecosystems.

Briefly, spatial modeling works by finding a statistical relationship between the presence of a certain species or habitat and a number of environmental conditions, such as depth, wave exposure, type of substrate, etc. The presence of the focal species or habitat in each part of a map can then be predicted using data layers describing environmental conditions. Maps produced by spatial modeling can thus visualize the distribution of species or habitats in an entire area of interest and provide a quantitative estimate of how much of that area is covered by a certain species or habitat. They can also be used as an input in spatial planning with GIS tools including establishing conservation values or spatial planning of marine protected areas using, for example, the software MARXAN. Along with the many advantages of maps produced by spatial modeling, it is important to acknowledge that for the production of reliable maps it is crucial to have high-quality background data. The quality and resolution of predictive maps can never be better than the underlying data layers.

Source:
Mohn C. *et al.* (2011), Modeling for Maritime Spatial Planning: Tools, concepts, applications - BaltSeaPlan Project (Report 19), Aarhus University, Denmark.

Strategic objectives formulation
One of the key issues in marine spatial planning is the multi-objective planning. Because MSP is new and addresses multiple management objectives, it is essential that the plan has clear aims/objectives and that the stakeholders are engaged.
The experts' advice on this best practice is summarized below:
1. A government engagement is a first and essential condition for a successful Maritime Spatial Plan. However, in order to successfully develop and implement a MSP, more than a high-level government mandate is required.
2. The engagement of local stakeholders is just as important as the government's, because their viewpoints, support and knowledge of the place are necessary to develop the plan. Stakeholders should be involved in MSP following a bottom-up approach.
Moreover, stakeholder engagement should include:

- Developing agreement about how the planning process should operate;
- Clearly communicating stakeholders' objectives;
- Helping stakeholders to recognize common ground among their objectives; and
- Establishing a process to identify and resolve conflicts among stakeholders.

3. In order to be successful in the long term, the marine spatial plans should have mechanisms that distribute the burden of proof about human impacts equitably among groups with different objectives. Often this burden of proof falls on people without funding or capacity to conduct the necessary research, monitoring or analysis, it would be more equitable

to shift or even share the burden of proof among multiple stakeholder groups or government agencies.

4. In terms of land valuation, it is important to use official, objective cost-benefit analyses in order to understand the potential outcome (benefits minus costs) of management alternatives. Cost-benefit analysis offers a framework for evaluating non-market values, such as the aesthetic value of coastal scenery or the existence value of endangered species in the Danube Delta, which are not usually measured in Euros.

5. Assessment is a useful instrument when there is a need to quantify positive and negative impacts of a decision on multiple sectors. The cost-benefit analysis should explicitly include market and non-market values and all sectors concerned should be included in the analysis.

6. In order to choose the best course of action, decision-makers and stakeholders find it very useful to consider alternative future scenarios along with their possible management actions.

7. Planning frameworks need to provide certainty in the short term, in order to enable stakeholders to proceed with investments in sea uses. However, a MSP should also be flexible in the long term in order to adapt to changing conditions and priorities.

8. Planning efforts should primarily be focused on a limited number of management objectives. The main focus when developing a MSP should be to use the data to help decision-makers to meet their overarching management objectives, such as fishery production, energy production, or environmental conservation and help them clearly define these objectives in legislation and policy.

9. It is better to develop an integrated plan that addresses multiple management objectives. Experienced planners in MSP advise to plan since the beginning for all major management objectives than to plan for one pair or small group of objectives at a time.

10. It should be clear from the start if the MSP also includes zoning, so that the different type and number of zones can be established. However, it is preferable to have fewer types of zones identified, in order to have a simplified planning, management, as well as better compliance.

Source:

The Nature Conservancy (2009), *Best Practices for Marine Spatial Planning*, Advice from a workshop organized by the Nature Conservancy's Global Marine Team.