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Regional meeting on applying methodology for programmes  
of measures and economic analysis in the NAP update

Athens, Greece, 11 – 13 May 2015

**Report of the meeting**

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## Report of the Meeting

### Introduction

Regional meeting on applying methodology for programmes of measures and economic analysis in the NAP update was held on 11- 13 May in Athens in the Royal Olympic hotel.

The main objectives of the meeting were to strengthen capacities for applying methodologies proposed in the NAP update *Guidelines*<sup>1</sup> (particularly for development of programmes of measures and the use of economic analysis) and to allow the NAP update teams to gain practical experiences with proposed methodologies through concrete examples and presentations from comparable projects and planning processes.

### Participation

The following Contracting Parties took part in the meeting: Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco, Slovenia, Spain, Tunisia and Turkey. NAP teams from Palestine and Jordan also participated. Each country was represented by one to three NAP team members including NAP coordinators (or other representatives of the lead national NAP institutions/ MED POL Focal Points), contracted/ nominated key NAP experts, and economists. Participants of the Coordination and Alignment Meeting (CAM) – Technical and Administrative Support Project financed by the EC, also attended the meeting. Furthermore, the meeting was attended by Plan Bleu and Union for the Mediterranean (UfM) representatives. NGO representation at the meeting included MIO-ECSDE and Algerian Association Ecologique de Boumerdes. The UNEP/MAP Secretariat was represented by the Coordinating Unit through the MED POL Programme. Regional NAP consultants, representatives of LDK (SWIM-SM project) and Arcadis/ COWI (implementers of the CAM project) also participated.

The full list of participants is attached as Annex I to the present report.

### Agenda item 1. Opening of the meeting

Mr. Gaetano Leone, UNEP/ MAP Coordinator opened the meeting emphasising the first NAPs have played an important role in identifying and implementing actions to protect the Mediterranean from pollution and in formulating other de-polluting initiatives such as the UfM Horizon 2020. He also stressed importance of cooperation and coordination between partner organisations in reaching the de-pollution objectives and expressed gratitude for the cooperation that enabled holding of the meeting on NAP update.

The 2015 NAPs need to incorporate new legal and policy developments such as the legally binding commitments of the Regional Plans as well as the EcAp Ecological Objectives 5, 9 and 10 on eutrophication, contaminants and marine litter and related targets. The update process is therefore expected to be challenging. That is why the Secretariat worked together with countries to develop appropriate methodologies to carry out the update in a harmonized manner. The purpose of the meeting is to assist the countries to overcome the expected challenges by presenting practical approaches and ways to implement the *Guidelines* and prepare NAPs in line with the COP 18 mandate.

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<sup>1</sup> UNEP (DEPI)/MED WG. 404/7, Annex IV.

**Agenda item 2. Election of officers**

In accordance with Rules of procedure for meetings and conferences of the Contracting Parties, the meeting elected a chair person, three vice-chair persons and one rapporteur as follows:

- Chair: Mr. Mohamed Farouk Osman (Egypt)
- Vice-Chair: Ms. Naima Ghalem (Algeria)
- Vice-Chair: Mr. Neoklis Antoniou (Cyprus)
- Vice-Chair: Ms. Ivana Bulatovic (Montenegro)
- Rapporteur: Ms. Valentina Turk (Slovenia)

**Agenda item 3. Adoption of the Agenda and organization of work**

The provisional annotated agenda contained in the document UNEP(DEPI)/MED WG.414/2 was adopted and appears as Annex II to the present report. Upon suggestion of the UfM representative, the meeting agreed to include presentation of the UfM database on priority investment projects for protecting the Mediterranean Sea on the agenda for the first day of the meeting.

It was agreed that the meeting would be held in plenary with English and French simultaneous interpretation. For practical sessions it was agreed the meeting would break into groups and that interpreters would be available to facilitate the work.

**Agenda item 4. Application of the National Action Plans (NAPs) update methodology including practical sessions and**

**Agenda item 7. Costing of the Regional Plans implementation**

Under agenda item 4, the Secretariat introduced documents UNEP(DEPI)/MED WG.414/4 and UNEP(DEPI)/MED WG.414/Inf.3, focusing in particular on the training exercise to be worked out during this agenda item (and serving as a basis for identification of measures to be subjected to economic analysis under agenda item 6). Information was provided on the situation in the two hypothetical river basins and on the tasks to be conducted during practical session. Factsheets A to E and other relevant annexes of the two documents (e.g. annex summarizing legal requirements and pertinent indicators) designed to guide the assessment and development of programme of measures were also explained.

The meeting asked for clarification on, among other things, the use of the term ‘issues’ in the proposed NAP update methodology and differences between legal and institutional measures and gaps. The questions were raised how to treat diffuse sources of pollution and how to define the scope of the assessment in the NAP update (or, in case of Jordan, preparation of the first NAP) – on the level of administrative regions or on the river basin level. The Secretariat provided clarifications and advices as regards the scope of the assessment: the countries are expected to carry out the analysis on river basin level and can extend the scope of assessments to encompass all relevant sources of pollution. The latter also means that NAP assessments can take into account requirements of Dumping and Hazardous Waste Protocols (as well as the Offshore Protocol), as appropriate.

UfM presented web-based application on priority investment projects, the features of which include *inter alia* automatic calculation of pollutant loads, and invited participants to use the tool in the course of NAP update as well as for other appropriate purposes.

The meeting continued with presentations on agenda items 4 (a) to 4 (d)<sup>2</sup>. Following completion of all the presentations and subsequent discussions, three groups for practical sessions were formed – on contaminants, eutrophication and marine litter – to carry out the following steps of the exercise:

- Assessment of mid-term benchmark and identification of gaps;
- Setting of quantifiable objectives/ operational targets;
- Identification and development of pollution prevention and control measures based on agreed criteria.

Within the groups working on eutrophication and marine litter, further division into sub-groups took place to make the discussion and group work more effective. Based on the hypothetical situation described in the training exercise, each group assessed mid-term baseline, defined the gaps between current state (including the state of the environment and legal, policy and institutional frameworks) and EcAp, Regional Plans and SAP-MED requirements. A number of operational objectives were then defined to address the gaps. Next step was identification of measures to meet the operational objectives, followed by exchange of results (list of measures) among groups. The exercise was completed through aggregation and prioritisation of measures.

Findings of different groups were presented in a plenary session. Based on the presentations and factsheets completed by the groups, the Secretariat summarised the findings and suggested some modifications at operational targets level for review by the meeting. The final results of the exercise i.e. completed factsheets were then circulated to all the participants for comments and/ or endorsement, and are annexed to present report (Annex IV).

Under agenda item 7, the Secretariat introduced document UNEP(DEPI)/MED WG.414/4 on possible approaches to assessing the cost of measures required under the Regional Plans on reduction of BOD (from urban waste water and from food industries), on reduction of inputs from mercury and on marine litter management. Compilation of information needed to assess the costs of implementing the four regional plans is expected to aid the NAP update/ preparation process and to allow for further analysis on the level of the Mediterranean. National currencies may be used for the assessments of costs on the national level; whenever possible, use of euro would be preferred. The document UNEP(DEPI)/MED WG.414/4 is included in the present report as Annex V.

#### **Agenda item 5. Socio-economic assessments at regional and country levels, and experiences gained through specific projects**

The Secretariat introduced the rationale, objectives and approaches for the sessions dedicated to economic analysis of programmes of measures (PoM).

Under agenda items 5(a), (b) and (c), Plan Bleu provided detailed presentations on applicable studies and projects. The following topics were covered:

- Results of economic and social analysis of human activities in the Mediterranean<sup>3</sup> (including description of sectors/ activities, linkages between impacts and activities, and information on the benefits from different activities); challenges linked to lack of data were highlighted.
- Approaches to assessing costs of degradation of marine environment – ecosystem, thematic and cost-based – with examples of applying these approaches in various countries/ contexts;

<sup>2</sup> As laid out in the provisional annotated agenda, these were: (a) overview of the NAP process and requirements; (b) assessing mid-term benchmark and defining gaps; (c) prioritising issues and setting quantifiable objectives/ operational targets; and (d) identifying and developing pollution prevention and control measures based on agreed criteria.

<sup>3</sup> As published in the technical report: Plan Bleu (2014), *Economic and social analysis of the uses of the coastal and marine waters in the Mediterranean*.

methodological and practical specificities that need to be kept in mind in the course of their application were also emphasised.

- Results from ReGoKo project (with pilot case studies undertaken in Egypt, Lebanon, Morocco and Tunisia, dealing with socio-economic assessments of the use of marine environment and attempts to compile information on and assess the costs of degradation).
- Adaptive Marine Policy (AMP) Toolbox developed in the framework of PERSEUS project was presented; the tool is available on line and can be used to facilitate policy formulation and planning processes such as the NAP.

The discussion that followed mainly focused on availability of data and information sources used for presented studies, as well as on *pros* and *cons* of different approaches to assessing the costs of degradation and interpretation and comparability of results. Suggestions were also made on possible solutions for assessing costs of degradation (e.g. combination of methods to overcome shortages and data gaps).

#### **Agenda item 6. Cost-effectiveness and cost-benefit analysis of programmes of measures: methodologies and country experiences**

Under the agenda items 6 (a), Arcadis presented experiences of the EU Member States with economic analysis in developing PoMs under the EU Marine Strategy Framework Directive (MSFD). This was followed by presentations from France, Spain, Slovenia and Croatia on the state of play of PoMs development (agenda item 6 (b)).

France presented the main steps undertaken in the elaboration of PoM (currently in the public consultation phase) and the approach to conducting cost-effectiveness analysis. Presentation from Spain focused on the database containing information on public expenditures to protect marine environment and other activities linked to MSFD implementation. The database was established in the process of elaborating PoMs. Slovenia presented stages in the process of MSFD implementation, including pertinent findings from the initial assessment and links with NAP. The main findings from economic and social analysis of the use and costs of degradation of marine environment and coastal area were presented by Croatia.

The meeting continued with presentations from the Secretariat on appendix G of the NAP update *Guidelines* on economic analysis and on cost-effectiveness (agenda items 6 (c) and (d)). It was recommended that the countries use economic analysis tools (preferably cost-effectiveness or cost-benefit analysis) for the final selection of NAP PoMs (after aggregation and initial prioritization of identified measures).

Practical session on cost-effectiveness analysis (CEA) took place subsequently, with groups assessing measures identified under eutrophication and marine litter objectives (with further sub-division of groups on river basin level) based on the proposed methodology/ assessment table. Findings from the group work were shared in a plenary session.

Under agenda item 6 (e), the Secretariat introduced approaches and requirements for carrying out cost-benefit analysis (CBA). Practical session was conducted in the way that three groups assessed costs and benefits of technical measures identified in the framework of different management scenarios under the overall objective of reducing and/ or eliminating hotspots in the two river basins (hypothetical, as described in the training exercise). The assessment was guided by the proposed methodology/ assessment table. Findings of the different groups were shared in a plenary session.

CAM project participants working in parallel sessions on identification of coordinated and joint measures on marine litter for the EU Mediterranean Member States, as well as on the assessment of cost-effectiveness and cost-benefits of such measures, shared the main results of their work during plenary session.

Finally, under agenda item 6 (f), multi-criteria analysis (MCA) was presented as a possible tool to be used for final selection of NAP PoMs; it was suggested that MCA should only be used when other tools (CEA and/ or CBA) would not be feasible.

Presentations delivered at the meeting and training materials are included in Annex VI of the present report.

**Agenda item 8. Conclusions and recommendations**

The participants reviewed draft conclusions and recommendations of the meeting and adopted them after proposing some revisions. The final version of conclusions and recommendations is presented as Annex III to the present report.

**Agenda item 9. Closure of the Meeting**

The meeting thanked the Secretariat for the opportunity to exchange experiences among different country representatives and teams working under various policy frameworks and projects. Opportunity to strengthen capacities for the use of practical approaches and methodologies for the development of 2015 NAPs was particularly acknowledged and appreciated by the participants.

In his closing remarks, the Chair thanked the participants for their contribution to the meeting and declared the meeting closed at 17:00 hours on Wednesday, 13 May 2015.



## **Annex I – List of Participants**

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**UNITED NATIONS ENVIRONMENT PROGRAMME/  
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## **Annex II – Agenda of the meeting**

## Introduction

In line with the agreement from the last MED POL Focal Points meeting held in Barcelona, Spain in December 2014, the Secretariat has undertaken steps to provide assistance and practical training to the contracting parties in implementing the NAP update *Guidelines* (UNEP (DEPI)/MED WG. 404/7, Annex IV). The *Regional meeting on applying methodology for programmes of measures and economic analysis in the NAP update* organised in cooperation with UfM Horizon 2020 Initiative and with the Technical and Administrative Support Project financed by the EC, has the following main objectives:

1. Strengthen capacities for applying in a harmonized manner the methodologies presented in the NAP update *Guidelines* with particular focus on programmes of measures and the use of economic analysis tools.
2. Allow key NAP update team members to gain practical experience with the use of different methodologies through concrete examples and presentations of achievements in comparative processes and projects.

## Provisional Annotated Agenda

### **Agenda item 1: Opening of the Meeting**

The Meeting will be opened by UNEP/MAP Coordinator.

### **Agenda Item 2: Election of Officers**

The Meeting shall elect a Chairperson, three Vice-Chairpersons and a Rapporteur.

### **Agenda Item 3: Adoption of the agenda and organisation of work**

The Rules and Procedures for meetings and Conferences of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols will apply *mutatis mutandis* to the present meeting (UNEP/IG.43/6, Annex XI).

The Provisional Agenda (UNEP(DEPI)/MED WG.414/1) annotated in the present document (UNEP(DEPI)/MED WG.414/2) will be reviewed, amended as necessary, and adopted by the Meeting.

Simultaneous translation in English and French will be provided during the Meeting.

At the end, the delegates will be invited to review and adopt the meeting conclusions and recommendations, amended as appropriate, drafted by the Rapporteur.

### **Agenda item 4: Application of the National Action Plans (NAPs) update methodology including practical sessions**

The purpose of this session is to provide practical guide to the meeting on the implementation of steps 2-5 of the NAP update *Guidelines* from mid-term assessment to identification of programmes of measures. The session will be held in plenary and in groups.

The main issues to be dealt with will be:

- a) Overview of the NAP process and requirements;
- b) Assessing mid-term benchmark and defining gaps;
- c) Prioritising issues and setting quantifiable objectives/ operational targets;
- d) Identifying and developing pollution prevention and control measures based on agreed criteria.

### **Expected outcome**

The groups are expected to undertake gap analysis, develop operational targets and identify potential measures for concrete study case addressing marine litter, industrial pollution and waste water sectors. The findings of each group will be shared in plenary.

### **Agenda item 5: Socio-economic assessments at regional and country levels, and experiences gained through specific projects**

The Secretariat will make a presentation on the rationale, objectives and approaches for the sessions dedicated to economic analysis of programmes of measures.

Plan Bleu will present:

- a) Results of the socio-economic assessment/ analysis of the uses of coastal and marine environment in the Mediterranean, highlighting the main findings, challenges (lack of data, disaggregation etc.) and how to overcome them, as well as advices/ lessons learnt for comparable activities in the NAP update process.
- b) ReGoKo project (Sustainable Med) – national pilot cases in Egypt, Lebanon, Morocco and Tunisia focusing on approaches used in assessing importance of the key economic sectors/ uses of marine waters and on methods and results of assessing costs of degradation of marine ecosystem.
- c) An on line Adaptive Marine Policy (AMP) Toolbox developed in the framework of PERSEUS project.

### **Expected outcome**

The participants will receive information on up-to-date developments in the Mediterranean in the field of socio-economic assessments and on developing adaptive marine policy. Presented information and tools may be used by the countries as a source of data and methodological aid for the NAP update.

### **Agenda item 6: Cost-effectiveness and cost-benefit analysis of programmes of measures: methodologies and country experiences**

Under this agenda item a number of overall presentations will be made in plenary session addressing the following topics:

- a) Experiences with respect to economic analysis to support development of the Programme of Measures (PoM) for the EU Marine Strategy Framework Directive (MSFD) (Arcadis).
- b) Development of Programme of Measures:
  - French process on development of PoM under MSFD;
  - State of play of MSFD PoM in Spain;
  - Experiences with development of Programme of Measures in Croatia and Slovenia (tbc).
- c) UNEP/MAP guidance on cost-effectiveness and cost-benefit analysis as presented in Appendix G of the NAP update *Guidelines* UNEP (DEPI)/MED WG. 404/7, Annex IV.

The participants will be split in groups to undertake through concrete examples an economic analysis for previously identified measures. The participants will be supported to use as appropriate the following tools:

- d) Cost-effectiveness analysis (CEA);
- e) Cost-benefit analysis (CBA);
- f) Multi-criteria analysis (MCA);

### **Expected outcome:**

The groups are expected to select final measures based on the results of economic analysis as appropriate. The findings of each group will be shared in plenary. The plenary will further discuss potential collaboration for the implementation of measures with a particular focus on the common ones.



**Agenda item 7: Costing of the Regional Plans implementation**

The Secretariat will introduce document UNEP(DEPI)/MED WG.414/4 that describes a number of approaches to assess the cost of measures required under the Regional Plans adopted by Contracting Parties in the framework of LBS Protocol of the Barcelona Convention. This agenda item will be addressed together with agenda item 4.

**Expected outcome**

The participants will receive information on the ways of assessing the costs of implementation of measures provided for in the Regional Plans.

**Agenda item 8: Conclusions and recommendations**

Under this Agenda item, the meeting will review, amend and adopt conclusions and recommendations that may arise from the meeting drafted by the Rapporteur.

**Agenda item 9: Closure of the Meeting**

The Chairperson will close the Meeting at 17:00 hours on 13 May 2015.

**DRAFT TIMETABLE**

<b><i>Monday, 11 May 2015</i></b>	
09:00 – 09:30	Registration
09:30 – 09:45	Agenda item 1: Opening of the Meeting
09:45	Agenda item 2: Election of Officers
09:45 – 10:00	Agenda item 3: Adoption of the agenda and organisation of work
	Agenda item 4: Application of the NAP update methodology including practical sessions
10:00 – 11:00	<i>Agenda items 4(a ) and (b)</i> Overview of the NAP process and assessment of mid-term benchmark including practical session
11:00 – 11:20	<i>Coffee break</i>
11:20 – 12:30	<i>Agenda items 4(c) and (d)</i> Setting of objectives and development of pollution prevention and control measures including practical sessions
12:30 – 14:00	<i>Lunch break</i>
14:00 – 16:00	<i>Agenda items 4(c) and (d)continued</i> Practical sessions
16:00 – 16:20	<i>Coffee break</i>
16:20 – 17:00	<i>Agenda items 4(a), (b), (c) and (d)</i> Plenary on findings of the practical sessions and <i>agenda item 7</i> Costing of the Regional Plans implementation
<b><i>Tuesday, 12 May 2015</i></b>	
	Agenda item 5: Socio-economic assessments at regional and country levels, and experiences gained through specific projects
09:30 – 11:00	<i>Agenda items 5(a), (b) and (c)</i> Introduction to economic analysis and Plan Bleu's, ReGoKo and PERSEUS project presentations
11:00 – 11:20	<i>Coffee break</i>
	Agenda item 6: Cost-effectiveness and cost-benefit analysis of programmes of measures: methodologies and country experiences
11:20 – 12:30	<i>Agenda items 6 (a) and (b)</i> Economic analysis to support development of PoMs under the EU MSFD (Arcadis) and state of play of PoMs in France, Spain, Croatia and Slovenia (tbc)
12:30 – 14:00	<i>Lunch break</i>
14:00 – 15:30	<i>Agenda items 6 (c) and (d)</i> UNEP/MAP guidance and practical session on CEA
15:30 – 15:50	<i>Coffee break</i>
15:50 – 17:00	<i>Agenda item 6 (d) continued</i> Practical session on CEA
<b><i>Wednesday, 13 May 2015</i></b>	
09:30 – 11:00	<i>Agenda item 6 (e)</i> Practical session on CBA
11:00 – 11:20	<i>Coffee break</i>
11:20 – 12:30	<i>Agenda item 6 (e) continued</i> Practical session on CBA
12:30 – 14:00	<i>Lunch break</i>
14:00 – 15:10	<i>Agenda item 6 (f)</i> Practical session on MCA
15:10 – 15:30	<i>Coffee break</i>
15:30 - 17:00	Agenda item 8: Conclusions and recommendations
17:00	Agenda item 9: Closure of the Meeting

## **Annex III Conclusions and recommendations**

## **Conclusions and Recommendations/ Findings and Lessons Learned**

With the view to facilitate the work of the Contracting Parties on updating the NAPs for the implementation of the LBS Protocol and its Regional Plans in the framework of SAP-MED, to achieve Good Environmental Status for Pollution-Related EcAp Ecological Objectives (EO), the Secretariat and Horizon 2020 capacity building through the SWIM-SM project, organized the regional meeting on applying methodology for programmes of measures and economic analysis in the NAP update/ preparation. The meeting was held at the Royal Olympic Hotel in Athens, Greece, on 11-13 May 2015.

The regional meeting aimed to:

- Familiarize countries' NAP update/ preparation teams regarding the implementation, in a step-by-step practical approach, of the NAP update Guidelines, with particular focus on the midterm assessment and development of programmes of measures (PoM) including the economic analysis.
- Present and share experiences on socio-economic assessments developed at regional and country levels, as well as those gained through specific projects and country experiences for elaboration of PoMs, including cost-effectiveness (CEA), cost-benefit analysis (CBA) and multi-criteria analysis (MCA).

The meeting acknowledged that significant experiences have been gained and information obtained on the regional and national levels regarding the development of the PoMs and use of socio-economic analysis in addressing environmental pollution in the Mediterranean. These should be used in the NAP update/ preparation process to the greatest possible extent to address data gaps and develop/ adjust available methodologies to use cost-effectiveness and/or cost-benefit analysis in the final selection of measures.

Following the practical sessions based on example cases, the results achieved by the breakout groups validated the step-by-step practical approach proposed by the Secretariat in undertaking:

- a. The analysis of the MAP Barcelona Convention pollution related commitments, herein after referred as MAP commitments;
- b. Midterm assessment of current environmental status and the existing policies and measures;
- c. Gap analysis;
- d. Developing operational targets and identification of required measures for their achievement;
- e. Aggregation of identified measures;
- f. Final selection of measures based on economic analysis.

In this context, the following lessons learned and findings and recommendations were identified:

### **Scope and bottom up approach of the NAP process**

1. It is recommended to use the bottom-up approach, at first carrying out the analysis at the river basin<sup>1</sup> level, where appropriate, per each EO/ sector, and then summing up the results

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<sup>1</sup> As provided for in the LBS Protocol of the Barcelona Convention, Article 4 Protocol Application

at higher administrative level(s) based on country specific geographical conditions and limitations, keeping in mind the need for a meaningful aggregation of similar targets where appropriate.

2. NAP update teams are strongly encouraged to include in the NAP update process other sectors such as the dumping, oil offshore industry, aquaculture, desalination and agriculture sectors, as well as diffuse sources of pollution, as appropriate, that were not addressed in the previous NAPs.

### **Midterm assessment**

3. The real situation in the countries will be more complex than the training example. Therefore, a comprehensive midterm assessment listing existing legislation, strategies and related operational targets, analyzing pollutants' trends, hotspots categorization, pressures, impacts and ongoing projects are crucial for the proper implementation of the NAP update process. In order to facilitate the process, it is suggested to start this analysis by classifying/ grouping the MAP commitments by the nature of the requirements, e.g. legal, policy, technical, monitoring, etc. This would facilitate matching the relevant information, data, and indicators of the current situation/ midterm baseline. Considering that NBB 2013 and the hotspot list update are crucial steps to carry out the midterm assessment, it is strongly recommended that the countries which have not done so, would complete and submit them to the Secretariat as early as possible. To this end, the Secretariat was requested to further support this process. It is also recommended to build on the assessment made by the Contracting Parties during the elaboration of the first NAP.
4. In addition, selection and populating the most relevant NAP indicators as presented in Annex E of the NAP update Guidelines with datasets to the extent possible, including related EO5, EO9 and EO10 ECAP indicators, may be an effective way to assess the midterm baseline and ensure a sustainable follow-up of NAP implementation in the future.

### **Operational targets**

5. The step related to defining operational targets is one of the most challenging tasks in the NAP updating/ preparation process. Operational targets should be designed to address quantitative reduction in the input of pollutants/ substance categories into the marine environment, including prevention. The quantitative reduction should be justified by the midterm baseline/ existing operational targets and the identified gaps against the MAP commitments.
6. The deadline of the identified operational target should at least mirror the date in the MAP commitment. If the specified date cannot be met, the NAP update team is advised to propose additional measures including the new deadline for achievement and the rationale behind it.
7. With regards to the aggregation from the river basin to national levels, preliminary operational targets are set at the river basin level; however, all efforts should be made to aggregate similar operational targets nationally. Reduction targets set per each river basin level as appropriate can be aggregated at the national level by reflecting conservative deadlines. With regards to the aggregated quantitative targets, it is recommended to take into account all relevant river basin targets.

### **Measures/ programs of measures**

8. The step related to the identification of measures/ PoMs to meet the proposed operational targets does not seem to pose any challenges, including their aggregation by type of measure, e.g. legal, institutional, and technical, etc.
9. Efforts should be made to ensure measures are formulated in a specific manner (either in the identification and/ or aggregation stage) and in such a way as to enable the assessment of their overall effectiveness; in other words, complementary measures or measures depending on each other to achieve the effects should be grouped together.
10. Prioritization criteria for the programme of measures was found suitable and could be easily applied by the NAP update teams in proposing a potential list of measures/ PoMs that could be subject to the final selection through the application of the economic analysis as appropriate.
11. It is recommended to set country-specific priority scoring quorum for the selection of measures to be subject to the economic analysis; however, this value may be set between 50% and 70% of the total score, ensuring a good balance between all types of measures, as appropriate.

#### **Economic analysis and final selection of measures/ programs of measures**

12. The NAP update teams are recommended to use the proposed approaches to estimate the costs of implementing the regional plans thus facilitating the estimation of the costs of NAP update measures and to allow for further analysis of costs on the regional level.
13. It is very important to assess potential and limitations of using different decision-supporting tools (such as CEA and CBA) in specific national contexts, and to decide on the appropriate level of analysis. Teams working on the NAP update/ preparation should provide to coordination/ steering bodies the necessary information to make decisions on the need, applicability and feasibility of different tools.
14. Lack of data on the value of ecosystem services was identified as a major obstacle to applying CBA in the course of NAP update/ preparation. A proposal was put forward to the Secretariat to consider possibilities to provide assistance by supporting appropriate assessments in pilot countries in line with the Millennium Ecosystem Assessment.
15. The lack of technical and economic information that hampers application of CEA and CBA can be addressed by the engagement of multiple stakeholders who can provide valuable insights through a participatory process. A CEA & CBA process coupled with the active involvement of stakeholders is strongly recommended for selecting cost-effective measures, which eventually should be validated by a public consultation process.
16. More emphasis should be given to a better description of economic activities/ sectors as driving forces of changes in marine and coastal ecosystems by the NAP update teams. This should be accompanied with a thorough assessment (in quantitative or qualitative terms) of related benefits. Finally, a good elaboration of linkages to related pressures and impacts is of paramount importance for conducting economic analysis in the NAP update. NAP update teams should work together closely to complete these tasks.
17. In the course of practical sessions related to economic analysis, the following points were highlighted regarding the use of economic tools:
  - It is very important to ensure common understanding of the scoring criteria to assess overall environmental effectiveness of measures;

- Subjectivity of the assessment, incomplete information and uncertainty were identified as the main limitations of the proposed approach; and
  - The importance of multi-disciplinary approach to assessing the effectiveness of measures was pointed out.
18. The Secretariat encourages the Contracting Parties to draw upon the experiences presented during the meeting and practical sessions to design country specific methodologies and processes to conduct CEA, CBA and/ or MCA, at the appropriate and viable level, as decision supporting tools in selecting as appropriate the final PoMs.

#### **Final remarks**

19. It is recommended to use the attached factsheets A to D, completed based on the results of the practical sessions as a concrete application of the document UNEP(DEPI)/MED WG.414/3 'Facilitating the implementation of NAP update Guidelines: from midterm benchmark to programmes of measures', as well as document UNEP(DEPI)/MED WG.414/4 'Approaches to estimating the costs for the Regional Plans/ legally binding measures adopted by the Contracting Parties'.
20. The meeting requested the Secretariat to provide continuous support and technical advice to the NAP update/ preparation teams with the view to ensure a timely submission of NAPs by November 2015 at the latest.

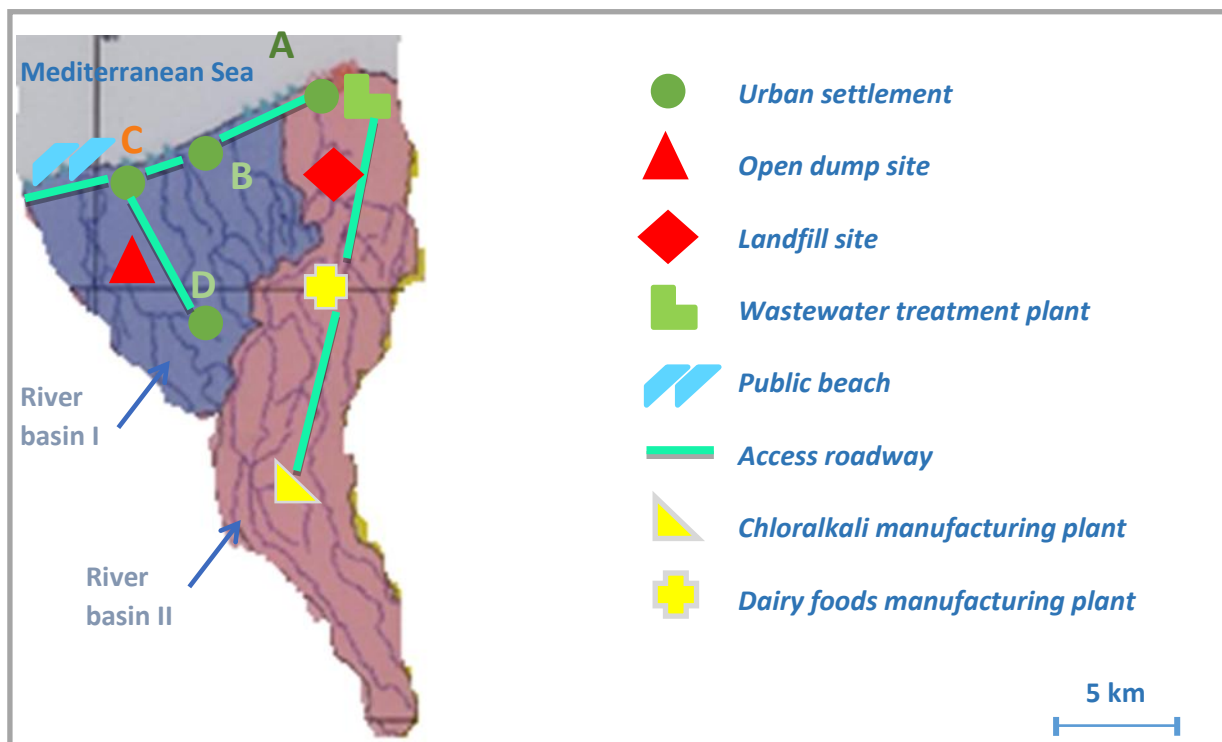
## **Annex IV - Completed factsheets and problem statement**



# TRAINING EXERCISE

## Description and the final group result

Two river basins (I & II), shown below, consist of a system of riverine tributaries discharging to the Mediterranean. In the summer, the river tributaries have low water levels and occasionally dry-up. In the winter, river flow increases due to snow melt from nearby mountains. Occasional flash floods are common in the spring. Subsurface geology is a karstic rock formation.



The following tables provide information on:

- **Table 1:** Description of existing human activities.
- **Table 2:** Current environmental status including pollutants/substances concentrations and/or loads.
- **Table 3:** Hotspots categorization.
- **Table 4:** Description of existing pollution prevention and control measures.
- **Table 5:** Adopted legislation, regulations, policies and strategies.

Tasks to be undertaken by each of the “Working Groups” in order to elaborate the Programme of Measures for river basins I and II are explained in the following sections. Tasks are numbered in accordance with the numbering of the phases included in document UNEP(DEPI)/MED WG.414/3. For each task, reference is made to the related ‘Fact Sheet’ included in the aforementioned document.

**Table 1: Description of Existing Human Activities**

River Basin I		River Basin II															
<ul style="list-style-type: none"> <li>Characterized as a recreational/touristic area; total revenues from tourism € 70 million, estimated share of employment 30%.</li> <li>An aquaculture site (open sea) with annual production capacity of 180 tons.</li> <li>Three towns with an average annual population growth of 3%:</li> </ul> <table border="1"> <thead> <tr> <th rowspan="2">Town</th> <th colspan="2">Population</th> </tr> <tr> <th>Summer*</th> <th>Winter</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>8,000</td> <td>2,000</td> </tr> <tr> <td>C</td> <td>50,000</td> <td>10,000</td> </tr> <tr> <td>D</td> <td>3,000</td> <td>50</td> </tr> </tbody> </table> <p>* <i>high season monthly data</i></p>		Town	Population		Summer*	Winter	B	8,000	2,000	C	50,000	10,000	D	3,000	50	<ul style="list-style-type: none"> <li>Characterized as an industrial area with a major urban centre. Agriculture and fishing are the second and third largest sectors. Respective shares of employment are 27% and 19%.</li> <li>City 'A': population 210,000 inhabitants, with an average annual growth of 1.5%.</li> <li>Secondary urban wastewater treatment plant designed for 150,000 PE built in 2008 east of the City.</li> <li>One chloralkali plant established in 2000 uses mercury cell technique for manufacturing chlorine.</li> <li>Currently, the chloralkali plant stores metallic mercury and solid waste contaminated with mercury.</li> <li>The chloralkali site is contaminated with mercury. As the yearly production capacity of chlorine increased from 35,000 tons in 2000 to 50,000 tons in 2015, the release of mercury to the environment via products, air emissions and aqueous effluents has proportionally increased.</li> <li>One dairy food industry (cheese manufacturing) with a capacity of 25,000 tons of cheese per year.</li> <li>The plant started as a small family business in 1990. By 2010, an automated production line was established to produce 250 tons of cheese per year.</li> <li>Cheese manufacturing plant discharges organic matter mainly via its aqueous effluents.</li> <li>One landfill receiving municipal solid waste and some industrial waste from City 'A' and existing industries.</li> <li>No public beaches.</li> <li>Distance to neighboring country 8 km (to the east).</li> </ul>	
Town	Population																
	Summer*	Winter															
B	8,000	2,000															
C	50,000	10,000															
D	3,000	50															
<ul style="list-style-type: none"> <li>No wastewater treatment plants within the river basin.</li> <li>Town 'D' discharges raw sewage to the river tributary flowing directly into the sea close to town 'C'.</li> <li>Towns 'B' and 'C' discharge raw sewage directly into the sea.</li> <li>One open dumpsite located near the main roadway used by the three towns to dispose of their municipal solid waste (MSW).</li> <li>Several recreational beaches.</li> <li>SPAMI<sup>1</sup> Protected area (turtles) and proposed national PA (coastal wetland); economic value of marine and coastal PA assessed at € 50 million.</li> <li>Eutrophication sensitive area.</li> </ul>																	

<sup>1</sup> Specially Protected Areas of Mediterranean Importance (SPAMI) defined by 1995 Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean.

**Table 2: Current Environmental Status including Pollutants/Substances Concentrations and/or Loads**

River Basin I					River Basin II				
<ul style="list-style-type: none"> <li>SAP-MED Sector: urban environment.</li> <li>Ecological objectives: EO5 and EO10.<sup>2</sup></li> <li>Main pollutants' emissions measured in the river outlet and national Emission Limit Values (ELV) in mg/l:</li> </ul>					<ul style="list-style-type: none"> <li>SAP-MED Sector: urban environment and industrial development.</li> <li>Ecological objectives: EO5, EO9, EO10.<sup>2</sup></li> <li>Main pollutants' emissions and national Emission Limit Values (ELV) in mg/l:</li> </ul>				
		2004	2014	National ELV		WWTP	Dairy industry	Chloralkali plant	National ELV
<b>BOD</b>	Summer	300	450	60	<b>BOD</b>	100	850	50	60
	Winter	80	100		<b>COD</b>		3,500		200
<b>N Total</b>	Summer	20	35	25	<b>N Total</b>	25	40		25
	Winter	15	21		<b>P Total</b>	10	16		10
<b>P Total</b>	Summer	10	18	10	<b>TSS</b>	80			-
	Winter	8	10		<b>Fats</b>		75		-
<b>Total suspended solids (TSS)</b>	Summer	170	200	-	<b>Chloride</b>		1,500		-
	Winter	45	50		<b>Cu</b>	10		20	-
<b>Pb</b>	Summer	-	3	-	<b>Pb</b>	15			-
	Winter	-	1	-	<b>Hg</b>	0.01		0.04	0.05
<b>Zn</b>	Summer	-	10	-	<b>Trichloromethane (TCM)</b>			26	-
	Winter	-	4	-	<b>Chlorine</b>			0.5	-

<sup>2</sup> EO5: eutrophication; EO9: contaminants; EO10: marine litter

**Table 2: Current Environmental Status including Pollutants/Substances Concentrations and/or Loads**

River Basin I	River Basin II
<ul style="list-style-type: none"> <li>• Marine litter from recreational activities and the dumpsite are transported to sea either directly or via running water in river tributaries during winter/spring seasons; additional loads come through sewerage.</li> <li>• 75% of municipal solid waste is collected and deposited in the open dumpsite; 25% is scattered along the coastal area and informally along the sides of roads.</li> </ul> <p><b><u>Pressures:</u></b></p> <ul style="list-style-type: none"> <li>• Population growth in summer (400% during high season).</li> <li>• Increasing number of recreational facilities at a yearly rate of 3%.</li> <li>• Increasing number of beach goers</li> <li>• Lack of treatment of municipal wastewater flowing into the Mediterranean.</li> <li>• BOD emissions at the river outfall exceed national ELV (60 mg/l) and Regional Plan<sup>3</sup> ELV (50 mg/l).</li> <li>• Total N and P emissions in summer exceed national ELV (25 and 10 mg/l, respectively).</li> <li>• Surface area of the illegal dumpsite increasing in size</li> <li>• Increasing trend of illegal dumping of solid wastes along sides of roads.</li> </ul> <p><b><u>Impacts - Eutrophication:</u></b></p> <ul style="list-style-type: none"> <li>• Concentrations of Total Nitrogen and Total Phosphorus in water column exceed prevailing physiographic, geographic and climate conditions (GES target).<sup>4</sup></li> </ul> <p><b><u>Impacts – Marine litter:</u></b></p> <ul style="list-style-type: none"> <li>• Increase in the amount of litter ingested by or entangling turtles.</li> <li>• Increase in the number/amount of marine litter items deposited on the coastline and on the seafloor.</li> </ul>	<ul style="list-style-type: none"> <li>• 90% of municipal solid waste is collected and deposited into landfill.</li> <li>• Marine litter items are wind-blown from the landfill site to the sea; additional loads from tourism and wastewater.</li> </ul> <ul style="list-style-type: none"> <li>• Chloralkali total emissions via products, air emissions and aqueous effluents are 1.22 g mercury/ton of annual chlorine capacity (0.15 g Hg/ton Cl<sub>2</sub> to water).</li> <li>• The chloralkali plant uses 82 tons of metallic mercury in cells and, additionally, stores about 13 tons of metallic mercury.</li> <li>• Chloralkali industrial wastes containing mercury (average mercury content 200 mg /kg waste) are currently exported for safe treatment. Some wastes from maintenance are sent to the municipal landfill.</li> <li>• Solid industrial wastes from the dairy industry are also sent to the municipal landfill site.</li> </ul> <p><b><u>Pressures:</u></b></p> <ul style="list-style-type: none"> <li>• Population growth (1.5% per year).</li> <li>• Wastewater treatment plant receives raw sewage that exceeds its design capacity.</li> <li>• BOD discharges from the WWTP and dairy industry exceed national ELV (60 mg/l) and Regional Plan ELV for urban wastewater<sup>3</sup> and food sector<sup>5</sup>, respectively.</li> <li>• Total N and Total P emissions from WWTP and dairy industry exceed national ELV (25 and 10 mg/l, respectively).</li> <li>• Illegal dumping of industrial hazardous waste in the municipal landfill.</li> <li>• Leachate seepage into the karstic rock formation.</li> <li>• Decreasing trend in mercury releases from the chloralkali plant.</li> <li>• Mercury emissions complying with national ELV in water but still exceeding ELV</li> </ul>

<sup>3</sup> Decision IG19/7. Regional Plan on the reduction of BOD5 from urban waste water (BOD ≤50 mg/l).

<sup>4</sup> Decision IG 21/3 on the Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and targets.

<sup>5</sup> Decision IG 20/8.2. Regional Plan on the reduction of BOD5 in the food sector (BOD ≤30 mg/l).

**Table 2: Current Environmental Status including Pollutants/Substances Concentrations and/or Loads**

River Basin I	River Basin II
<p><b><u>Impacts – Bathing water quality:</u></b></p> <ul style="list-style-type: none"> <li>• Decrease of transparency in coastal waters.</li> <li>• Increase in number of incidences of gastro-intestinal diseases during summer months.</li> </ul> <p><b><u>Impacts – Marine biodiversity:</u></b></p> <ul style="list-style-type: none"> <li>• Increase in deposition of marine litter on the seafloor affecting SPAMI.</li> <li>• Turtles’ abundance levels are maintained but still below natural levels (GES target).</li> <li>• Increase in the abundance of NIS (mussels) introduced by human activities.</li> </ul>	<p>for products air and water set by the Regional Plan.<sup>6</sup></p> <p><b><u>Impacts - Eutrophication:</u></b></p> <ul style="list-style-type: none"> <li>• Chlorophyll-a concentration in the water column is below thresholds (GES target).<sup>4</sup></li> </ul> <p><b><u>Impacts – Marine litter:</u></b></p> <ul style="list-style-type: none"> <li>• Maintained trend in the number/ amount of marine litter items in the water surface and the seafloor.</li> <li>• Number/amount of marine litter items in the water surface and the seafloor do not have negative impacts on human health, marine life, ecosystem services and do not create risk to navigation.</li> </ul> <p><b><u>Impacts – Contaminants:</u></b></p> <ul style="list-style-type: none"> <li>• Increase in mercury concentrations in sediments and biota.</li> <li>• Increase in the frequency of cases of sardine and anchovies’ samples above regulatory limits for mercury.</li> </ul>

<sup>6</sup> Decision IG 20/8.1 Regional Plan on the reduction of inputs of mercury ( $\leq 1\text{g Hg/t Chlorine}$  manufactured).

**Table 3: Hotspots Categorization**

Table 3: Hotspots Categorization					
Categories and subcategories		River basin I		River basin II	
		Score	Criteria	Score	Criteria
Public health	Population	2	10,000-100,000 within 20 km	4	> 100,000 inhabitants within 10 km
	Wastewater collection and treatment	4	Urban wastewater (agglomerations > 10,000 PE) not collected or treated	3	The sewer network has big leakages and WWTP overflows
	Drinking water quality	3	Any industrial or urban wastewater, or solid waste or agricultural run-off reaching drinking water sources which are filtered but not disinfected before storage and distribution	3	Any industrial or urban wastewater, or solid waste or agricultural run-off reaching drinking water sources which are filtered but not disinfected before storage and distribution
	Bathing water quality	4	No monitoring data	4	No monitoring data
Good Environmental Status	Organic matter	4	Significant deviation from the RP/national ELV for point sources	4	Significant deviation from the RP/national ELV for point sources
	Nutrients	4	Significant deviation from GES target	3	Deviation from GES target
	Contaminants	1	Meeting GES targets	4	Significant increase of frequency of cases of seafood samples above regulatory limits for contaminants and significant deviation from GES target
	Marine litter	4	Significant increase of number of areas with accumulated marine litter at sea and in the land part of the coastal zone up to 1 km close to the river mouth and run-off drainage system. Illegal dump sites.	2	Maintained trends in the amounts of litter washed ashore and/or deposited on coastlines

**Table 3: Hotspots Categorization**

<b>Table 3: Hotspots Categorization</b>					
<b>Categories and subcategories</b>		<b>River basin I</b>		<b>River basin II</b>	
		<b>Score</b>	<b>Criteria</b>	<b>Score</b>	<b>Criteria</b>
<b>Economics</b>	Economic activities and underpinning ecosystem services	2	Tourist area between 10,000 to 100,000 tourists annually	3	Moderate effects on aquaculture or fisheries and/or close to an important aquaculture and fisheries area.
<b>Transboundary Effects</b>	Transboundary/ Trans-regional Effects	1	Area far from the border with no direct/indirect effect	3	Downstream area close to the borders discharging to the Mediterranean sea Moderate amounts of substances which are toxic, persistent and liable to bio-accumulate and/or marine litter.
<b>Total score and Classification</b>		<b>100</b>	<b>Hotspot 'B'</b>	<b>110</b>	<b>Hotspot 'B'</b>

**Table 4: Description of Existing Pollution Prevention and Control Measures**

River Basin I	River Basin II
<p><b><u>Municipal wastewater treatment sector</u></b></p> <ul style="list-style-type: none"> <li>• An old sewage network is in place, but it leaks extensively and is under capacity in summer season; there is no separate collection of wastewater and storm waters.</li> <li>• There are no wastewater treatment plants for towns ‘B’, ‘C’ and ‘D’.</li> <li>• Raw sewage is discharged by town ‘D’ to a river tributary where, in the summer, it penetrates the ground through the karstic rock formation while in the winter, it is washed down with the flowing river water to the sea.</li> <li>• Raw sewage is discharged by towns ‘B’ and ‘C’ directly to the sea.</li> <li>• National water and wastewater strategy considered the collection and treatment of sewage in all the coastal cities with more than 20,000 PE (including Town C) by 2015. A project for WWTP for 30,000 PE was developed in 2011. Feasibility study showed water tariffs would need to increase by 60% to cover investment and operational costs.</li> </ul> <p><b><u>Municipal solid waste sector</u></b></p> <ul style="list-style-type: none"> <li>• Collection and transport of municipal solid waste is organized by the three municipalities. Waste is collected in open trucks and transported to the open dump site. There are no waste separation/ recycling provisions.</li> <li>• Marine litter along the beach is not collected on a regular basis nor monitored.</li> <li>• Municipal solid waste in the open dump site is often burned in order to make place for new waste.</li> <li>• The national master plan for solid waste management considered the closure of the illegal dumpsite and the construction of a new sanitary landfill by 2012. The plan was not implemented due to lack of funding.</li> <li>• There is a proposal to introduce deposit refund system for beverage containers and a tax on the usage of plastic bags.</li> </ul> <p><b><u>Marine and coastal environment</u></b></p> <ul style="list-style-type: none"> <li>• Pollutants’ concentrations are periodically measured at the river outlet, BOD and nutrients exceed national ELV and also the Regional Plan<sup>7</sup> ELV in summer.</li> <li>• There are no water quality measurements on intestinal enterococci concentrations</li> </ul>	<p><b><u>Municipal wastewater treatment sector</u></b></p> <ul style="list-style-type: none"> <li>• Sewage network is being expanded to account for the increase in population and to allow for separate collection of storm water. Work will be completed in 2018.</li> <li>• Municipal wastewater treatment plant applies secondary treatment processes, but is designed for a BOD load of 150,000 PE. It has not been expanded with the growing population.</li> <li>• Municipal WWTP is not capable of treating industrial wastewater.</li> <li>• Water pollution charges for emissions above ELVs are in place but not enforced.</li> <li>• Sludge generated from the WWTP is sold to farmers as fertilizer. It contains heavy metals including mercury.</li> </ul> <p><b><u>Municipal solid waste sector</u></b></p> <ul style="list-style-type: none"> <li>• Municipal solid waste is collected in regulated covered trucks and transported to the landfill.</li> <li>• Town ‘A’ has adopted a policy that advocates recycling and reuse of solid waste; estimated recycling rate is 9%, mainly metal fraction.</li> <li>• Landfill is currently not fit for hazardous waste disposal and does not enforce regulation to ban disposal of such types of waste.</li> <li>• Hazardous waste disposal charge is not collected.</li> <li>• There is no leachate collection system for the landfill site.</li> <li>• Landfill does not control the transport of windblown litter to sea (i.e. no fence or soil cover).</li> <li>• National master plan for solid waste management foresees the construction of an industrial waste disposal site adjacent to the existing site and to extend and adapt the current landfill to new legal standards by 2020.</li> </ul> <p><b><u>Industrial development sector</u></b></p> <ul style="list-style-type: none"> <li>• Chloralkali surrounding soil and groundwater has been assessed to be contaminated with mercury; however, the extent and effect of contamination has not been evaluated to date.</li> <li>• Chloralkali plant has implemented techniques to reduce mercury emissions to</li> </ul>

<sup>7</sup> Decision IG19/7. Regional Plan on the reduction of BOD5 from urban waste water ( $\leq 50$  mg/l BOD).



**Table 4: Description of Existing Pollution Prevention and Control Measures**

River Basin I	River Basin II
<p>in bathing waters.</p> <ul style="list-style-type: none"> <li>• Concentrations of Total N and Total P in water column are sometimes monitored showing that exceed prevailing physiographic, geographic and climate conditions (GES)<sup>8</sup> in summer.</li> <li>• Quality of bathing waters in recreational beaches is not regulated or monitored but a decrease in transparency and an increase in marine litter have been identified.</li> </ul> <p><b><u>Biodiversity and protected areas</u></b></p> <ul style="list-style-type: none"> <li>• There is a SPAMI site within the River basin I due to the presence of turtles and there is a proposal for designation of national coastal PA. National law on protected areas is not fully enforced.</li> </ul>	<p>water based on good practices on monitoring and leak detection/repair and cleaning and recovery of mercury. However, total emissions (products, water and air) still exceed ELV set by the Regional Plan on Mercury,<sup>9</sup> mainly due to emissions to air. Regional Plan ELV to be achieved by 2018.</p> <ul style="list-style-type: none"> <li>• Chloralkali plant has committed itself to convert current mercury cell plant to membrane cell plant by 2020 and manage metallic mercury from the decommissioning process in an environmentally sound manner.</li> <li>• Cheese manufacturing plant has significant losses of product (milk, fat and whey) and the wastewater treatment process reduces only about 40-60% of organic matter content.</li> <li>• In response to inspections and administrative sanctions, the cheese manufacturing plant is in the process to implement BAT and BEP in order to reduce losses of product by 2016 and to establish a pre-treatment plant to decrease BOD concentration by 2020 in order to comply with national ELV on BOD.</li> </ul>

<sup>8</sup> Decision IG 21/3 on the Ecosystems Approach including adopting definitions of Good Environmental Status (GES) and targets.

<sup>9</sup> Decision IG 20/8.1 Regional Plan on the reduction of inputs of mercury ( $\leq 1$ g Hg/t Chlorine manufactured).

**Table 5: Adopted Legislation, Regulations, Policies and Strategies**

Legislation and regulations	Policies and strategies
<ul style="list-style-type: none"> <li>• The main national legal instruments that regulate specific environmental protection issues and create the necessary legal support for implementing the pollution prevention and control measures at the national level are:               <ul style="list-style-type: none"> <li>– Environment Law, which mandates the Ministry of Environment to prepare the regulations necessary to preserve the environment in its three media (air, water and land) from pollution, and to undertake environmental monitoring and inspections to assess compliance, enforce implementation of regulations, and impose sanctions in the event of non-compliance.</li> <li>– Water Law, which addresses the protection of inland water resources and seawater from pollution and contamination (including municipal wastewater).</li> <li>– Waste Law, which classifies types of waste, provides for prevention and recycling and sets main obligations for both producers and managers.</li> <li>– Law on protected areas.</li> <li>– National standard on the allowable criteria for discharging treated wastewater into aquatic environments, ELV on BOD, N, P and some heavy metals, not distinguished by sectors.</li> <li>– National regulation on standard requirements for landfills and the acceptable contents of hazardous substances in deposited waste.</li> <li>– <u>No regulations</u> have been adopted regarding marine quality standards.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The national environmental policy framework with regard to pollution prevention and control includes:               <ul style="list-style-type: none"> <li>– River basins management plan. Plan calls for reducing riverine marine litter by 20% by 2025.</li> <li>– Coastal Areas Management Programme (CAMP).</li> <li>– Water and wastewater strategy. Strategy paper calls for construction of wastewater treatment plants for all agglomerations of more than 2000 inhabitants by 2025.</li> <li>– The national master plan for solid waste management. Plan calls for recycling and reuse of waste. No clear operational target is set.</li> <li>– Air pollution abatement strategy. Strategy calls for reduction of heavy metals in air emissions by 20% by 2025.</li> <li>– National Implementation Plan for the Stockholm Convention on persistent Organic Pollutants.</li> <li>– Integrated Strategy on Hazardous Substance and Waste Management (including heavy metals and organohalogens). Strategy calls for safe handling and disposal of generated hazardous wastes from polluting industries by 2025.</li> </ul> </li> <li>• Strategy on historically contaminated sites. Sites contaminated with mercury, POPs and other hazardous substances are identified and measures to assess the extent of the contamination are put in place. Remediation stage is progressively implemented in priority sites, no timeframe defined.</li> <li>• No specific mention of the following policies and framework strategies could be found:               <ul style="list-style-type: none"> <li>– Wastewater reclamation and reuse.</li> <li>– Management and reuse of sludge.</li> <li>– Protection of marine biodiversity.</li> <li>– Management of marine litter generated at beaches and other public places.</li> </ul> </li> </ul>

## Tasks to be undertaken by the Working Groups in order to define the Programme of Measures for River Basins I & II

### Task 1: Description of the Midterm Baseline

Based on:

- i. The described information regarding existing human activities (Table 1), current environmental status (Table 2), hotspots categorization (Table 3), existing pollution prevention and control measures (Table 4), and the legal and policy frameworks (Table 5); and
- ii. The guidance notes and templates<sup>10</sup> provided in the working document “Facilitating the Implementation of NAP Update Guidelines: From Midterm Benchmark to Programmes of Measures” UNEP(DEPI)/MED WG.414/3;

Kindly elaborate the expected environmental status (i.e. the midterm baseline), based on the following elements, and as appropriate:

- List of existing policy, legislative and regulatory measures.
- List of existing operational targets.
- Trends of pollutants’ loads and their prospects in the years to come.
- List of hotspots and sensitive areas.
- Major impacts on marine environment and ecosystems and trends of marine pollution levels.
- List of ongoing projects and their prospects in the future.

Please integrate the resulting information from the above noted points into the second column of MIDTERM BASELINE FACT SHEET (A) in document UNEP(DEPI)/MED WG.414/3.

*The MEDPOL Focal Point in their meeting in December 2014 agreed, in principle, on a number of NAP follow-up indicators.<sup>11</sup> Relevant indicators to this exercise are included in Annex A. It is highly recommended to assess midterm baseline by populating the indicators with relevant data to the extent possible.*

*In order to underpin the overall assessment with a good description of socio-economic conditions (current and expected) in the analyzed area, and to allow for a good understanding on the links between human activities and related environmental pressures and impacts, the following questions need to be considered:*

- *Distribution of population and key economic sectors and sub-sectors;*
- *Direct and indirect benefits from different uses of marine environment (e.g. revenues, employment, direct and indirect contribution to GDP, value of services provided by ecosystems, etc.);*
- *Pressures from economic sectors (e.g. size of fishing fleet, total catches, number of overnight stays of tourists, type and capacity of tourist accommodation, type and size of coastal industries) and related impacts (e.g. per sector/ sub-sector);and*
- *Trends in human activities (demography, economy) with related pressures and impacts within the timespan of updated NAP.*

<sup>10</sup> Templates of document UNEP(DEPI)/MED WG.414/3 are reproduced at end of this document.

<sup>11</sup> The NAP Update Guidelines is included in the Draft Report of the Second MED POL Focal Points meeting on NAP update [UNEP(DEPI)/MED WG.404/7].

### **Task 2A: Analysis of Gaps**

Based on the midterm baseline elaborated in Task 1, please assess the gaps to achieve the GES targets, SAP-MED and Regional Plans requirements by completing the third column of the MIDTERM BASELINE FACT SHEET (A) in document UNEP(DEPI)/MED WG.414/3.

*With the view to carry out this exercise, the Secretariat compiled in Annexes A and B of this document a list of relevant requirements for this particular exercise:*

- *Annex A provides a list of pollution prevention and control requirements from the Regional Plans and SAP-MED for consideration in setting operational targets. These are classified based on SAP-MED sector (i.e. municipal wastewater, solid waste, industrial development, in addition to physical alterations and destruction of habitats).*
- *Annex B contains a list of requirements pertinent to legal, institutional and policy frameworks such as monitoring, inspection, enforcement and reporting. These requirements can be integrated into proposed policies and regulations in the framework of existing framework structures.*

Kindly match the relevant legally binding GES targets, SAP-MED and Regional Plans requirements and obligations which are related to the two river basins in Annexes A and B to the information and indicators' data used for the midterm assessment and complete the first column of the MIDTERM BASELINE FACT SHEET (A) in document UNEP(DEPI)/MED WG.414/3.

### **Task 2B: Prioritization of Issues**

Based on the gaps identified in Task 2A, investigate the issues behind these gaps and prioritize them.

*Some of the underlying issues behind the gaps may be highly related to aspects for reducing pollution from land-based sources. Other issues may be completely irrelevant and should be discarded. As their scope and number may be quite long, relevant issues should be prioritized. This process would ensure the establishment of a proper framework for setting realistic quantifiable/ operational targets. The following are some suggestions for prioritization of issues for the purpose of this exercise:*

- *Existing operational measures.*
- *Significant deviations from requirements for key priority contaminants and related sectors.*
- *Worrisome and substantive increases of pollution loads for key contaminants over the last 10 years (increases in drivers and pressures exceed the measures).*
- *Geographical categorization of direct and non-direct releases into the marine environment.*

### **Task 2C: Setting the Operational Targets**

Based on the identified gaps in Task 2A and prioritized issues in Task 2B, and with reference to the legally binding requirements included in Annex A, kindly establish the quantifiable objectives/operational targets that would meet the GES targets, SAP-MED and Regional Plans requirements. For the purpose of this exercise, please limit the number of operational targets for each ecological objective to three targets. Kindly fill the forth column of the MIDTERM BASELINE FACT SHEET (A) in UNEP(DEPI)/MED WG.414/3.

*Operational targets should be:*

- *SMART (specific, measurable, achievable, realistic and timely).*
- *Set at the national level, but if necessary, targets be may be also set at the regional level.*

*Operational targets may be, as appropriate:*

- *Set halfway in time or phased prior to reaching the final target date.*
- *Similar to those required by the SAP MED, Regional Plans or EcAp GES targets in case no existing measures are implemented.*
- *Lower in quantifiable terms than the legally binding requirements in case the existing measures are effective in pollution prevention and control (e.g. 20% BOD reduction by 2020 and 50% BOD reduction by 2025).*

*In setting the operational targets and implementation timetable, economic analysis should be used to evaluate:*

- *Overall socio-economic conditions and expected trends as a framework for setting the targets*
- *Objectives/ environmental improvements in light of economic benefits they bring (e.g. potential for development of existing/ new sectors, new jobs) or in light of avoided costs of environmental degradation (e.g. prevention of economic losses due to decrease in tourism, falling fish stocks, public health related expenditure).*

### **Task 3A: Identification of Potential Measures**

Based on the established operational targets set in Task 2C and the gaps identified in Task 2A, kindly suggest potential measures to bridge each gap by focusing on issues of highest priority as determined in Task 2B. Select one Ecological Objective (EO) to work with. Identify potential measures for the selected EO. Propose individual measures to fulfill each operational target at the river basin level. Specify the type of proposed measure. Kindly fill the corresponding column of the POTENTIAL NEW MEASURES FACT SHEET (B) in document UNEP(DEPI)/MED WG.414/3 (one sheet for each operational target).

*Potential measures are directly linked to each operational target and related ecological objective. Type of measures may be legal, institutional, policy, economic or technical/ investment.*

### **Task 3B: Aggregation of Potential Measures**

Based on the suggested potential measures for the selected EO in Task 3A, and taking into consideration proposed measures by other working groups for the two other EOs,<sup>12</sup> aggregate measures between sectors and between river basins in order to establish an integrated list of potential measures. Coordinate with other groups to produce a single list. Fill the corresponding columns of the INTEGRATED MEASURES FACT SHEET (C) in document UNEP(DEPI)/MED WG.414/3.

<sup>12</sup> Note that as a single Ecological Objective was selected in Task 3A, the integrated measures will only contribute to the achievement of the EcAp targets of this particular objective.

*Potential measures may be aggregated horizontally between sectors within a single river basin, and integrated vertically between the two river basins. The aggregated measures are linked to the operational target noting the administrative hierarchy where the measure will be implemented (regional or local) and the type of measure (legal, institutional, policy, economic, technical/investment). One simple criterion to apply for aggregation is whether a single measure is dependent on another for the achievement of an operational target. In that regard, measures strictly of legal, institutional, policy or economic nature should be integrated into existing national/ regional policy frameworks and structures; hence, strengthening these frameworks.*

### **Task 3C: Shortlisting Measures**

Based on the single aggregated and integrated list of measures agreed between all working groups in Task 3B, kindly shortlist, prioritize and rank in your own group these measures in descending order. Prioritization categories and ranking criteria are suggested for shortlisting the aggregated measures in Annex C. Complete the corresponding form of the PRIORITY FACT SHEET (D) in document UNEP(DEPI)/MED WG.414/3. Measures with the highest scores are ranked first to be considered for economic analysis.

*In principle, six categories and four criteria are suggested for shortlisting aggregated measures in Annex C. Categories include overall GES achievements; elimination of hot spots/sensitive areas, contribution to ecological objectives; technical feasibility, geographical scope and implementation timetable. Scores from 1 to 4 are proposed along with the prioritization criteria; the highest score indicating the most favorable measure. Based on the aforementioned criteria, measures with the highest scores are ranked first, and hence are candidates for economic analysis. It is recommended that ranking is limited to pollution prevention and control measures.*

In the following sections, the completed aforementioned fact sheets for this exercise are presented based on answers provided by the training course participants.

## MIDTERM BASELINE FACT SHEET (A) Ecological Objective EO5

Legally binding requirement/obligation <i>include ID number</i>	Midterm baseline	Existing gap	Operational target	
			Description	ID
Enforce the adopted ELVs by monitoring discharges from municipal wastewater treatment plants into the environment (2019)	<p><u>Legislation:</u></p> <ul style="list-style-type: none"> <li>- Water law</li> <li>- Protected areas law.</li> </ul> <p><u>Policies and strategies:</u></p> <ul style="list-style-type: none"> <li>- National environmental policy (water and wastewater strategies, national master plan for municipal solid waste).</li> </ul> <p><u>Pollutants' trends</u></p>	<ul style="list-style-type: none"> <li>- ELV of 60 mg/l does not meet regional plan requirement</li> <li>- Protected area not enforced</li> <li>- BOD, Total N and P – trend of increasing input into marine environment – not being addressed by WWTP.</li> <li>- Inability to protect turtles</li> </ul>	Ensure by year 2019 full compliance with adopted ELV for organic matter.	EO5/W1
Ensure that all agglomerations of more than 2,000 inhabitants collect and treat their urban wastewater before discharging them into the environment (2019)	<p>- Increase in BOD, Total N, P, TSS.</p> <p><u>Pressures:</u></p> <ul style="list-style-type: none"> <li>- Seasonal increase in population.</li> </ul> <p><u>Impacts:</u></p> <ul style="list-style-type: none"> <li>- Eutrophication.</li> <li>- Marine biodiversity.</li> </ul> <p><u>Ongoing projects and outcomes:</u></p> <ul style="list-style-type: none"> <li>- Project (wastewater) for town C I for 150,000 PE</li> </ul>	<ul style="list-style-type: none"> <li>- Project (wastewater) for town C I inadequate</li> <li>- Cost recovery tariff should be updated.</li> </ul>	Reduce by 2019 inputs of organic matter including nutrients by XX%	EO5/W2

## MIDTERM BASELINE FACT SHEET (A) Contaminants Ecological Objective EO9

Legally binding requirement/obligation <i>include ID number</i>	Midterm baseline	Existing gap	Operational target	
			Description	ID
Concentration of Priority contaminants in biota, sediments or water, is kept within acceptable limits (SAP MED) requirements	<ul style="list-style-type: none"> <li>- Increase in mercury concentrations in sediments and biota.</li> <li>- Increase in the frequency of cases of sardine and anchovies' samples above regulatory limits for mercury.</li> <li>- No standard ELV</li> <li>- Whole river basin is hotspot</li> <li>- Chloralkali total emissions via products, air emissions and aqueous effluents are 1.22 g mercury/ton of annual chlorine capacity (0.15 g Hg/ton Cl<sub>2</sub> to water).</li> <li>- The chloralkali plant uses 82 tons of metallic mercury in cells and, additionally, stores about 13 tons of metallic mercury.</li> <li>- Chloralkali industrial wastes containing mercury (average mercury content 200 mg /kg waste) are currently exported for safe treatment. Some wastes from maintenance are sent to the municipal landfill</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of projects/initiatives?</li> <li>- ELV and EQS set for overall contaminants needs review</li> <li>- Pollution reduction measures missing.</li> <li>- Lack of regulatory framework?</li> <li>- Chloralkali plants need maintenance. New technology.</li> <li>- Concrete measures to eliminate contaminated site in the area</li> <li>- New technology not using mercury needed.</li> <li>- Gap on ensuring enforcement and compliance</li> <li>- No legal provision on decommissioning of industries discharging mercury. No decommission plans existing.</li> <li>- No operational target at national level on mercury</li> </ul>	Phase out by 2020 input of heavy metals to the marine and coastal environment	EO9/I1
Cease releases of mercury from the activity of chloralkali plants (Reg, plan Requirement)			Complete/adjust [by 2019 at the latest] of ELV-EQS regulatory framework to streamline the relevant GES targets for the list of priority contaminants	EO9/I2
Eliminate to the fullest possible extent pollution caused by discharges, emissions and losses of organohalogen compounds [SAP-MED Requirement]			Eliminate by 2020 at the latest [XX%] of hotspots which are heavily contaminated	EO9/I3



## MIDTERM BASELINE FACT SHEET (A) Marine Litter Ecological Objective EO10

Legally binding requirement/obligation <i>include ID number</i>	Midterm baseline	Existing gap	Operational target	
			Description	ID
Adopt preventive measures to minimize inputs of plastic in the marine environment (2017)	<u>Legislation:</u> - Water law - Waste Law - Regulation on landfills - Protected areas law. <u>Policies and strategies:</u> - River basin management plan. - Coastal areas management programme. - Master plan for solid waste - Strategy for hazardous substances <u>Pollutants' trends</u> - 75% of municipal solid waste is collected and deposited in the open dumpsite; 25% is scattered along the coastal area and	<ul style="list-style-type: none"> <li>- Weak institutional arrangements to monitor, enforce, collect data, report and disseminate to the public on issues related to marine litter in accordance with the regional plan requirements.</li> <li>- Lack of public awareness and education of pollution with regard to marine litter management (i.e. clean-up campaigns, etc.)</li> <li>- Lack of engineered landfill for proper disposal and burial of solid waste.</li> </ul>	Reduce by 2020 the number of marine litter hotspots at sea and coast by [XX%]	EO10/S1
Close to the extent possible existing illegal solid waste dump sites (2020)			Reduce by 2020 the quantity of marine litter inputs originating from solid waste by [X%]	EO10/S2

## MIDTERM BASELINE FACT SHEET (A) Contaminants Ecological Objective EO9

Legally binding requirement/obligation <i>include ID number</i>	Midterm baseline	Existing gap	Operational target	
			Description	ID
	informally along the sides of roads. - Surface area of the illegal dumpsite increasing in size. <u>Pressures:</u> - Seasonal increase in population. - Fishing activities. - Illegal dumping of industrial hazardous waste - Agricultural activities - Wastewater treatment plants receiving amounts of wastes. <u>Impacts:</u> - Increasing trend of illegal dumping of solid wastes along sides of roads. - Entanglement of turtles with marine litter. <u>Ongoing projects and outcomes:</u> - 90% of municipal solid waste is collected and deposited into landfill. - The existing MSW site will be extended and adapted to new legal standards by 2020.		Reduce by 2019 the quantity of marine litter in hotspot areas by [XX%]	EO10/S3
			Reduce marine litter coming from landfill by 50% by 2019	EO10/S4

**POTENTIAL NEW MEASURES FACT SHEET (B)  
to fulfill the operational targets for Eutrophication (EO5)**

Related ecological objective(s)	Operational targets include ID number	ID Number of potential measure	Potential measures at regional level <i>to close the gap identified in the midterm baseline fact sheet (A)</i>	Type of measure				
				L	I	P	E	T
EO5	Ensure by year 2020 full compliance with adopted ELV for organic matter. (EO5/W1)	EO5/W1/M1	Adopt ELV for nutrients	x				
		EO5/W1/M2	Regulate economic mechanism to legislation	x				
		EO5/W1/M3	Strengthen legal department		x			
		EO5/W1/M4	Provide funding sources for upgrading facilities (loans, etc.)					x
		EO5/W1/M5	Implement fines and incentives to decrease pollution				x	
		EO5/W1/M6	Construct or upgrade WWTP taking into account the population growth and proper ELV					x
		EO5/W1/M7	Raise awareness on agriculture sources and promote organic farming		x			
	Reduce by 2019 inputs of organic matter including nutrients by XX% (EO5/W2)	EO5/W2/M1	Adopt stricter ELV for BOD to comply with RP	x				
		EO5/W2/M2	Provide technical assistance to food sector industries					x
		EO5/W2/M3	Voluntary agreements and implementation of environmental performance certificates				x	
		EO5/W2/M4	Implement water pollution charges				x	
		EO5/W2/M5	Provide subsidies and tax breaks for industries reducing pollution loads				x	
	EO5/W2/M6	Ensure pretreatment of wastewater from cheese manufacture					x	

## POTENTIAL NEW MEASURES FACT SHEET (B) to fulfill the operational targets for contaminants (EO9)

Related ecological objective(s)	Operational targets include ID number	ID Number of potential measure	Potential measures at regional level <i>to close the gap identified in the midterm baseline fact sheet (A)</i>	Type of measure				
				L	I	P	E	T
EO9	Phase out by 2020 heavy metals input to the marine and coastal environment (EO9/I1)	EO9/I1/M1	Feasibility study whether to close plant or change technology					x
		EO9/I1/M2	Adopt legislation on decommissioning	x				
		EO9/I1/M3	Develop a decommission plan and related socioeconomic aspects					x
		EO9/I1/M4	Adopt BAT to reduce total releases of Mercury, to bridge gap before change of technology/closure.					x
		EO9/I1/M5	Apply environmentally sound management, compliance, enforcement (as needed)					x
		EO9/I1/M6	Prefeasibility study on disposal hazardous waste in environmental manner					x
		EO9/I1/M7	Survey/assessment (audit) on the areas of the plant					x
		EO9/I1/M8	Prefeasibility study for closure/change of technology					x
		EO9/I1/M9	Project development in collaboration with Investment donors					x
		EO9/I1/M10	Set regulatory framework on ELV for mercury		x			
		EO9/I1/M11	Define and set up the monitoring program, and develop the indicators			x		
		EO9/I1/M12	Institutional and financial set up of the monitoring program			x		
		EO9/I1/M13	Define communication/data portal, accessibility to data, etc.			x		
		EO9/I1/M14	Conduct capacity building on standard methods on monitoring					x

## POTENTIAL NEW MEASURES FACT SHEET (B) to fulfill the operational targets for contaminants (EO9)

Related ecological objective(s)	Operational targets include ID number	ID Number of potential measure	Potential measures at regional level <i>to close the gap identified in the midterm baseline fact sheet (A)</i>	Type of measure				
				L	I	P	E	T
EO9	Complete/adjust [by 2019 at the latest] of ELV-EQS regulatory framework to streamline the relevant GES targets for the list of priority contaminants (EO9/I2)	EO9/I2/M1	Set up or adjust the ELV EQS framework regarding mercury.	x				
		EO9/I2/M2	Disseminate BEP and BAT regarding mercury industry		x			
		EO9/I2/M3	Baseline assessment for the definition of ELV and EQS					x
		EO9/I2/M4	Consultations with industries, voluntary agreements				x	
	<i>Eliminate by 2020 at the latest [XX%] of hotspots which are heavily contaminated (EO9/I3)</i>	EO9/I3/M1	Survey/assessment (audit) on the status of the hotspot					x
		EO9/I3/M2	Prefeasibility study for hotspot elimination					x
		EO9/I3/M3	Project development in collaboration with Investment donors					x

## POTENTIAL NEW MEASURES FACT SHEET (B) to fulfill the operational targets for marine litter (EO10)

Related ecological objective(s)	Operational targets <i>include ID number</i>	ID Number <i>of potential measure</i>	Potential measures at regional level  <i>to close the gap identified in the midterm baseline fact sheet (A)</i>	Type of measure				
				L	I	P	E	T
EO10	Reduce by 2020 the number of marine litter hotspots at sea and coast by [XX%] (EO10/I1)	EO10/S1/M1	Closure and rehabilitation of open dump and construction of a sanitary landfill					x
		EO10/S1/M2	Awareness campaigns to promote waste minimization at the source		x			
	Reduce by 2020 the quantity of marine litter inputs originating from solid waste by [X%] (EO10/I2)	EO10/S2/M3	Put a differentiated tax on consumption of plastic products				x	
		EO10/S2/M4	Review and update existing legal framework on marine litter	x				
		EO10/S2/M5	Improve SW collection and transport systems					x
		EO10/S2/M6	Establish an efficient enforcement system (monitoring, inspection...)		x			
	Reduce by 2019 the quantity of marine litter in hotspot areas by [XX%] (EO10/I3)	EO10/S3/M1	Tax [or ban] on plastic bags usage (single use)				x	
		EO10/S3/M2	Awareness campaigns for the public		x			
		EO10/S3/M3	Legislation regarding packaging recycling	x				
		EO10/S3/M4	Expanded recycling schemes					x
	Reduce marine litter coming from landfill by 50% by 2019 (EO10/I4)	EO10/S4/M1	Cover and fence landfill					x
		EO10/S4/M2	Upgrade program for landfill					x
		EO10/S4/M3	Design and implement monitoring program for marine litter		x			
		EO10/S4/M4	Capacity building for landfill workers		x			

## INTEGRATED MEASURES FACT SHEET (C) to fulfill the operational targets at the national level

Operational targets include ID number		ID Numbers of aggregated measures	Potential measures at national level classified based on "type" of measure shown in Fact Sheet (B)	Administrative hierarchy national, regional, local
Legal	EO5/W1 EO5/W2	EO5/W1/M1 EO5/W2/M1	Set and adopt ELV for BOD (stricter value) and nutrients.	National
	EO9/I1 EO9/I2	EO9/I2/M1 EO9/I1/M10	Set up or adjust the ELV and EQS framework regarding mercury.	National
	EO10/S2	EO10/S2/M4	Review and update existing legal framework on marine litter	National
	EO10/S3	EO10/S3/M3	Legislation regarding packaging recycling	National
	EO9/I1	EO9/I1/M2	Adopt legislation on decommissioning mercury plant	National
	EO5/W1	EO5/W1/M2	Regulate economic mechanism to legislation	National
Institutional	EO5/W1	EO5/W1/M3	Strengthen legal department	National/regional
	EO10/S2 EO10/S4 EO9/I1	EO10/S2/M6 EO10/S4/M3 EO9/I1/M11 EO9/I1/M12	Design and implement the institutional and financial set-up of an efficient enforcement system (monitoring, inspection...) including marine litter and mercury and develop related indicators	National/regional
	EO9/I1	EO9/I1/M13	Define communication/data portal, accessibility to data etc.	National/regional
	EO10/S1 EO10/S3 EO5/W1	EO10/S1/M2 EO10/S3/M2 EO5/W1/M7	Public awareness campaigns to promote waste minimization at the source, agriculture pollution sources and promote organic farming	Regional
	EO9/I2 EO9/I1	EO9/I2/M2 EO9/I1/M14	Disseminate BAT/BEP to mercury industry and conduct capacity building on standard methods of monitoring.	National/regional
	EO10/S4	EO10/S4/M4	Provide also training for landfill workers.	National/regional

## INTEGRATED MEASURES FACT SHEET (C) to fulfill the operational targets at the national level

Operational targets include ID number	ID Numbers of aggregated measures	Potential measures at national level <i>classified based on "type" of measure shown in Fact Sheet (B)</i>	Administrative hierarchy <i>national, regional, local</i>	
Economic	EO5/W2 EO9/I2	EO5/W2/M3 EO9/I2/M4	Consultations with industries and voluntary agreements including implementation of environmental performance certificates	Regional
	EO5/W1	EO5/W1/M5	Implement fines and incentives to decrease pollution	National
	EO5/W2	EO5/W2/M4	Implement water pollution charges	National
	EO5/W2	EO5/W2/M5	Provide subsidies and tax breaks for industries reducing pollution loads	National
	EO10/S2 EO10/S3	EO10/S2/M3 EO10/S3/M1	Put a differentiated tax (or ban) on consumption of plastic products including plastic bags usage (single use)	National
Technical/investment	EO5/W1	EO5/W1/M4	Provide funding sources for upgrading facilities (loans, etc.)	National
	EO5/W2	EO5/W2/M2	Provide technical assistance to food sector industries	National
	EO5/W1	EO5/W1/M6	Construct or upgrade WWTP taking into account the population growth and proper ELV	Local
	EO5/W2	EO5/W2/M6	Ensure pretreatment of wastewater from cheese manufacture	Local
	EO10/S1	EO10/S1/M1	Closure and rehabilitation of open dump	Local
	EO10/S2	EO10/S2/M5	Improve solid waste collection and transport systems	Regional
	EO10/S3	EO10/S3/M4	Expand recycling schemes	Regional
	EO10/S4	EO10/S4/M2	Construct a sanitary landfill and covering and fencing existing landfill	Local



## INTEGRATED MEASURES FACT SHEET (C) to fulfill the operational targets at the national level

Operational targets include ID number	ID Numbers of aggregated measures	Potential measures at national level <i>classified based on "type" of measure shown in Fact Sheet (B)</i>	Administrative hierarchy <i>national, regional, local</i>
EO9/I1	EO9/I1/M1 EO9/I1/M8	Feasibility study whether to close chloralkali plant or change technology	Local
EO9/I1	EO9/I1/M3 EO9/I1/M5	Develop a decommission plan and related socioeconomic aspects including environmentally sound management, compliance, enforcement (as needed)	Local
EO9/I1	EO9/I1/M4	Adopt BAT to reduce total releases of Mercury, to bridge gap before change of technology/closure	Local
EO9/I1	EO9/I1/M6	Prefeasibility study on how to dispose hazardous waste in environmental sound manner	National
EO9/I1	EO9/I1/M7	Survey/assessment (audit) on the areas of the chloralkali plant	Local
EO9/I1 EO9/I3	EO9/I1/M9 EO9/I3/M3	Project development in collaboration with Investment donors	Regional
EO9/I2	EO9/I2/M3	Baseline assessment for the definition of ELV and EQS	National
EO9/I3	EO9/I3/M1	Survey/assessment (audit) on the status of the hotspot	Regional
EO9/I3	EO9/I3/M2	Prefeasibility study for hotspot elimination	Regional
EO9/I3	EO9/I3/M3	Project development in collaboration with Investment donors	National

Technical/investment

## PRIORITY FACT SHEET (D)

### Prioritization of Programme of Measures

ID No. <i>of measure</i>	Integrated measures at the national level <i>as tabulated in fact sheet (C)</i>	Scores of the prioritization categories						Total Score
		Achievement of pollution-related GES targets	Elimination of hotspots	Contribution to other pollution-related ecological objectives	Technical feasibility	Geographical scope	Implementation timetable/urgency	
<b>Prioritization of additional measures by the Secretariat – Technical/investment measures</b>								
EO10/S1/M1	Closure and/or rehabilitation of open dump	4	4	2	4	4	4	<b>22</b>
EO9/I1/M4	Adopt BAT to reduce total releases of mercury, to bridge gap before change of technology / closure	4	4	3	4	4	2	<b>21</b>
EO5/W1/M6	Construct or upgrade WWTP taking into account the population growth and proper ELV	4	3	4	4	4	2	<b>21</b>
EO5/W2/M6	Ensure pre-treatment of wastewater from cheese manufacture	4	4	4	4	2	2	<b>20</b>
EO10/S2/M5	Improve solid waste collection and transport systems	4	3	3	3	3	2	<b>18</b>
EO5/W1/M4	Provide funding sources for upgrading facilities (loans, etc.)	4	3	2	3	3	2	<b>17</b>
<b>Prioritization of additional measures by the Secretariat – Legal measures</b>								
EO5/W1/M1 EO5/W2/M1	Set and adopt ELV for BOD (stricter value) and nutrients	3	3	2	3	3	2	<b>16</b>

EO9/I2/M1 EO9/I1/M10	Set up or adjust the ELV and EQS framework regarding mercury	3	3	2	3	3	2	16
EO9/I1/M2	Adopt legislation on decommissioning mercury plant	3	2	2	3	3	2	15
EO10/S3/M3	Legislation regarding packaging recycling	1	2	2	3	3	3	14
EO5/W1/M2	Regulate economic mechanism to legislation	2	2	2	3	3	2	14
EO10/S2/M4	Review and update existing legal framework on marine litter	1	1	2	3	3	2	12
<b>Prioritization of additional measures by the Secretariat – Institutional measures</b>								
EO10/S2/M6 EO10/S4/M3 EO9/I1/M11 EO9/I1/M12	Design and implement the institutional and financial set-up of an efficient enforcement system (monitoring, inspection...) including marine litter and mercury and develop related indicators	3	3	3	2	2	2	15
EO9/I2/M2 EO9/I1/M14	Disseminate BAT/BEP to mercury industry and conduct capacity building on standard methods of monitoring.	2	2	3	2	3	2	14
EO5/W1/M3	Strengthen legal department	2	2	2	3	2	2	13
EO10/S1/M2 EO10/S3/M2 EO5/W1/M7	Public awareness campaigns to promote waste minimization at the source, agriculture pollution sources and promote organic farming	2	1	3	2	2	2	12
EO9/I1/M13	Define communication/data portal, accessibility to data etc.	1	1	1	2	2	2	9
<b>Prioritization of additional measures by the Secretariat – Economic measures</b>								
EO5/W2/M3 EO9/I2/M4	Consultations with industries and voluntary agreements including implementation of environmental performance certificates	2	3	3	2	2	2	14
EO5/W1/M5	Implement fines and incentives to decrease pollution	2	2	2	3	3	2	14
EO5/W2/M5	Provide subsidies and tax breaks for industries reducing pollution loads	2	2	2	3	3	2	14
EO10/S2/M3 EO10/S3/M1	Put a differentiated tax (or ban) on consumption of plastic products including plastic bags usage (single use)	2	2	2	3	3	2	14
EO5/W2/M4	Implement water pollution charges	2	2	1	2	3	2	12

## **Annex V – Approaches to estimating the costs of the Regional Plans**

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## **1 Introduction**

Purpose of this document is to assist Contracting Parties to identify information needed to estimate the costs of implementing measures necessary to meet the Regional Plans' requirements through the National Action Plans (NAP) update process. This is expected to enable estimation of overall costs of implementing the key requirements of the Regional Plans (RPs) on the national level and to allow for further aggregation on the regional level.

The analysis focuses on the four Regional Plans: a) on the reduction of BOD<sub>5</sub> from urban waste water; b) on the reduction of BOD<sub>5</sub> from food sector; c) on the reduction of inputs of mercury; and d) on marine litter management.

Each Regional Plan is analysed in respective section of the document (sections 2 – 5) by elaborating the scope of the Plan, its main objectives, key measures envisaged and steps to estimate the costs. Key measures necessary to implement the requirements of respective RPs are detailed in a table format in Annex I of the document, whereas a checklist-type of questions and examples of tables to guide the national experts in the process are included in Annex II.

The document is primarily intended for the economists in the NAP update team who will be responsible for identification of necessary data to estimate overall costs of the Regional Plans implementation. It will be necessary, however, that they are supported by key NAP experts and thematic groups in identifying, collecting and analysing relevant information, especially when it comes to environmental standards, pollution loads and sources and activities of interest to the NAP.

## **2 Regional Plan on the reduction of BOD<sub>5</sub> from urban waste water**

### **2.1 Scope of the Plan**

The Regional Plan on the reduction of BOD<sub>5</sub> from urban waste water (hereinafter referred to as the RP on BOD from UWW or the Plan) refers to collection, treatment and discharge of urban waste water including:

- domestic waste water from residential settlements and services (originating predominantly from human metabolism and from household activities);
- domestic waste water mixed with industrial (pre-treated or not) and/ or run-off water.

The geographic area to which the RP on BOD from UWW applies is the hydrological basin of the Mediterranean Sea, in line with Article 3 of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources (LBS Protocol). All the direct or indirect discharges within the basin are subject to the Plan's provisions.

### **2.2 Main objectives**

The main objective of the RP on BOD from UWW is to protect coastal and marine environment and health from the adverse effects of direct and/ or indirect discharges of urban waste water within the hydrological basin of the Mediterranean Sea. The Plan in particular aims to address adverse effects on the oxygen content of the coastal and marine environment and eutrophication phenomena.

### **2.3 Key measures**

The RP on BOD from UWW requires Contracting Parties to ensure that urban waste waters are collected and treated prior to being discharged into the environment for all the agglomerations in the Mediterranean basin. For the purpose of the Plan, agglomerations are defined as areas where more

than 2,000 inhabitants and/ or economic activities are sufficiently concentrated for collection and treatment of waste water.

In designing and constructing waste water collection systems, the best technical knowledge regarding the volume and characteristics of UWW, high maintenance of piping system and of pumping equipment as well as separation of storm water (when applicable) need to be taken into account and applied.

The Plan also requires the Parties to:

- ensure treatment of all urban waste water;
- adopt national emission limit values (ELVs or maximum allowable concentrations of BOD<sub>5</sub> in treated waste water prior to discharge into environment);
- ensure that characteristics of collected and treated UWW meet the requirements of the following regional ELVs on BOD<sub>5</sub> (at 20°C without nitrification) for the effluents from every single wastewater treatment plant (WWTP):
  - o ≤ 50 mg/ l O<sub>2</sub> for secondary treatment,
  - o ≤ 200 mg/ l O<sub>2</sub> for primary treatment<sup>1</sup>.

The regional ELVs should only be adopted after consideration of local conditions and provided that total loads do not affect the receiving marine environment.

If stricter provisions are contained in the existing or future national, regional or international instruments or programmes, they will apply.

Discharges from WWTPs need to be monitored (in line with the Plan's Appendix II prescribing sampling method and frequency for different categories of agglomerations) by competent authorities to verify compliance.

Enforcement also needs to be ensured in line with national regulations.

The RP on BOD from UWW envisages two implementation deadlines: 2015 and 2019. The Contracting Parties are to decide on the appropriate deadline for implementation of ELVs taking into account national circumstances and ability to implement required measures. A national programme of action, including the adopted deadlines, was due for submission to the Secretariat within half a year from the Plan's adoption. National programmes and decisions on implementation deadlines should be prepared according to the guidelines and criteria included in Appendix III of the Plan. These guidelines and criteria aim at assisting the countries to take into account provisions of national legislation, size of agglomerations, and economic capacity to address collection and treatment of waste water in setting the implementation deadlines

The Parties are to report on the implementation of measures biannually and to review the status of implementation in 2013 and 2017.

## **2.4 Estimating the costs of the key measures**

In principle, five types of interventions are necessary to meet the requirements of the RP on BOD from UWW and they include:

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<sup>1</sup> Primary treatment: treatment of urban waste water by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD<sub>5</sub> of the incoming waste water is reduced by at least 20% before discharge and the total suspended solids of the incoming waste water are reduced by at least 50%.  
Secondary treatment: treatment of urban waste water by a process generally involving biological treatment with a secondary settlement or other process so that the treatment results in a minimum reduction of the initial load of 70-90% of BOD<sub>5</sub>.

1. Proper maintenance and upgrading (including rehabilitation) of the existing collection systems in line with best technical knowledge, including interventions on separation of storm water;
2. Expansion and/or development (new construction) of collection systems;
3. Upgrade of the existing WWTPs to meet regional ELVs (or national ones, if different than the regional);
4. Construction of new WWTPs to cover all agglomerations above 2,000;
5. Monitoring and enforcement activities.

Interventions 1 – 4 refer to investments or technical measures and their costs can be assessed in a three steps process

*STEP 1: Determine main cost elements*

- Quantify (in physical units such as km, number of pumping stations, population equivalent – p.e.<sup>2</sup> or similar) collection system maintenance and upgrade needs, including, where applicable, interventions to ensure separation of storm waters;
- Quantify the needs for new constructions of the collecting systems (in km, p.e);
- Quantify the necessary upgrade of existing WWTPs to reach the requirements of the RP (number and capacity of WWTPs needing upgrade, type of interventions necessary to ensure compliance with ELVs);
- Quantify the need for construction of new WWTPs to reach the requirements of the RP (how many, what capacity, what type of treatment).

In order to complete this step, national or regional waste water strategies, plans and goals need to be reviewed. If information is missing, estimations can be made based on comparative experiences/ data for urban centres where waste water collection and treatment needs have been assessed and quantified. National programme of action required under the RP on BOD from UWW, if prepared, should be taken into account as a reference for implementation deadlines. The same applies to the review of the implementation status performed in 2013 and biannual implementation reports (also required under the Plan), if any.

If the assessment of waste water collection and treatment needs will be done for the purpose of this exercise and not taken over (fully or partially) from other sources, it should be guided by criteria set out in the Appendix III and tailored according to national circumstances. In identifying the needs and assessing the costs, projects under implementation (where project documentation is completed, funding secured, works have started and/ or expected to start to lead to operation before national implementation deadline, e.g. 2019) should be excluded.

*STEP 2: Decide on unit costs to be applied*

Based on recent comparable projects or plans, identify realistic unit costs. Express in USD or EUR, or, when possible, in Purchasing Power Parity. Alternatively, available international costing methods could be applied<sup>3</sup>.

<sup>2</sup> For the purpose of Regional Plans on BOD from urban waste water and from food sector, one population equivalent (.e.) is defined as the organic biodegradable load having a five-day biochemical oxygen demand (BOD<sub>5</sub>) of 60 g of oxygen per day.

<sup>3</sup> UfM report *Update priority investment projects for protecting the Mediterranean Sea from pollution: evaluation of NAP investment portfolio – regional analysis*, for example, assessed investment costs of priority wastewater projects by using cost functions developed by COWI under FEASIBLE model whereas an adjustment (reduction) of 80% was applied for Southern Mediterranean countries.



*STEP 3: Aggregate the numbers, estimate the costs*

In the final step, aggregation of total costs will be made by multiplying unit costs and needs.

*Note: Level of detail in cost estimation can vary. Questions from the check list and associated table presented in Annex II of this document are meant to guide the countries to conduct detailed cost estimation. Nevertheless, if available data will not allow for such a level of detail, it will be possible to stop at more general level of analysis and have rougher estimates – they key question being what additional population<sup>4</sup> (p.e. estimate) needs to be served by adequate collection and treatment system by 2019 or other implementation deadline set in a given country to meet the RP requirements.*

Assessment of costs related to monitoring and enforcement activities required under the Plan can be made by determining the following elements:

- Number of samples that need to be tested annually and related prices; sampling method and frequency outlined in the Plan's Appendix II may be used as a reference.
- Inspection and other enforcement staff time and equipment needed to ensure compliance with ELVs.

Monitoring and inspection plans of competent authorities, when they exist, may be used as a source of information for estimating these costs. Capacity building needs, if estimated that current monitoring and enforcement capacities are insufficient to meet implement the Plan, should be also taken into account.

### **3 Regional Plan on the reduction of BOD<sub>5</sub> in the food sector**

#### **3.1 Scope of the Plan**

The Regional Plan on the reduction of BOD<sub>5</sub> in the food sector (hereinafter referred to as the RP on BOD from food sector or the Plan) refers to all the industries listed in the Plan's Appendix I within the hydrological basin (discharging directly or indirectly) of the Mediterranean Sea (the area is defined in accordance with Article 3 of the LBS Protocol). Industries included in Appendix I are: a) dairies; b) fruit and vegetable processing; c) breweries; d) wineries and distilleries; e) fish processing; f) sugar manufacturing; g) vegetable oil processing; h) canning and preserving; and i) meat processing and slaughtering.

#### **3.2 Main objectives**

The objective of this Regional Plan is to prevent pollution and to protect the coastal and marine environment from the adverse effects of discharges of organic load (BOD<sub>5</sub>) from food sectors.

#### **3.3 Key measures**

The main requirement of the Plan is for the Appendix I industries that discharge more than 4,000 p.e. to reduce pollution load through application of best available techniques (BAT)<sup>5</sup> or best environmental practices (BEP)<sup>6</sup>. In case respective industries discharge waste waters directly into recipient water bodies, the measures need to be tailored to ensure the following emission limit values (ELVs) are met:

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<sup>4</sup> Additional in the sense that is not covered by functional collection and treatment systems at the moment of assessment or by projects under implementation.

<sup>5</sup> BAT means latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste. (definition from Annex IV A of the LBS Protocol)

<sup>6</sup> BEP means the application of the most appropriate combination of environmental control measures and strategies. (definition from Annex IV B of the LBS Protocol)

- Chemical oxygen demand (COD) of 160 mg/l, or Total organic carbon (TOC) of 55 mg/l;
- Biochemical oxygen demand BOD<sub>5</sub> (or BOD<sub>7</sub>) of 30 mg/l.

In case industries discharge into sewerage systems, appropriate ELVs need to be set by competent authorities.

Provisions stricter than those set in the Plan may apply if they are adopted on the national level.

The Contracting Parties need to ensure appropriate monitoring takes place to verify compliance with the Plan's requirements.

The RP on BOD from food sector also requires Contracting Parties to enforce the set ELVs and application of necessary measures to reach them.

The emission limit values are to be reviewed by the Contracting Parties in 2015 based on experience with implementation of measures and recent developments, including any difficulties encountered with implementation and recent developments with BAT, BEP and/or environmental quality standard in the region.

The Contracting Parties have agreed upon adoption of the RP on BOD from food sector to implement the RPs ELVs by 2014 (taking into account national circumstances i.e. respective implementation capacities, as well as the need to reduce the use of water in food industries).

The Parties are to report on the implementation of measures biannually.

### **3.4 Estimating the costs of the key measures**

The costs associated with introduction of various measures listed as examples of BAT/ BEP in the RP on BOD from food sector will depend largely on the size of industry, local conditions and specificities and is therefore difficult to come up with generic cost units that could be applied to estimate overall costs on the national level. Instead, costs estimations will have to be made on a case by case basis. Some measures might be more demanding in terms of necessary investments as they may require major infrastructural interventions, purchase of specific technologies (equipment or know-how) and similar. On the other hand, for some measures (especially when it comes to BEP) expected costs would be rather low or negligible (or could even result with net savings).

Good sources of information would be industries themselves. Either on the planning basis (as part of their business and/ or investment plans) or through the already implemented upgrades, some industries might have available data on the scale of investments needed to bring their performance to the BAT/ BEP level. Certification for environmental standards (e.g. ISO 14000 family), if such processes had been applied in any of the industries under review, might also serve as a good source of information. There might be also available sector-specific studies in different countries (e.g. for modernisation of dairy sector, slaughter houses and meat processing etc.).

Similarly to the situation with the RP on BOD from UWW, monitoring and enforcement costs may be estimated by breaking down the task into:

- Number of samples that need to be tested annually and related prices (internationally accepted standardized sampling, analysis and quality assurance methods to be used whenever possible);
- Inspection and other enforcement staff time and equipment needed to ensure compliance of regulated industries with ELVs.

Monitoring and inspection plans of competent authorities, when they exist, may be used as a source of information for estimating these costs. Capacity building needs to ensure adequate monitoring and compliance, if any, should be also taken into account in estimating the costs of implementing the RP on BOD from food sector.

## **4 Regional Plan on the reduction of inputs of mercury**

### **4.1 Scope of the Plan**

The Regional Plan on the reduction of inputs of mercury (hereinafter referred to as the RP on mercury or the Plan) applies to the area defined in accordance with Article 3 of the LBS Protocol i.e. to the hydrological basin of the Mediterranean Sea. The Plan is intended to address all the anthropogenic releases in accordance with requirements of Article 4 of the LBS Protocol (primarily all land-based point and diffuse sources and activities within territories of the Contracting Parties that may affect directly or indirectly the Mediterranean Sea Area, as well as polluting substances transported by air).

### **4.2 Main objectives**

The objective of this Regional Plan is to protect the coastal and marine environment and human health from the adverse effects of mercury.

### **4.3 Key measures**

The measures that need to be implemented to fulfil the Plan's requirements refer primarily to chlor-alkali industries and non chlor-alkali industries using mercury in production processes. The RP on mercury also contains provisions pertinent to incineration plants and other sectors causing releases of mercury, to mercury containing wastes, contaminated sites and mercury mining. All the measures envisaged by the Plans can be categorised as:

1. Prohibiting (certain industrial processes, re-entry into the market, new mercury mines, including re-opening of the closed ones);
2. Phasing out releases of mercury from chlor-alkali plants;
3. Limiting emissions of mercury by adopting and enforcing emission limit values (ELVs); and
4. Ensuring environmentally sound management of metallic mercury from decommissioned plants, of wastes containing mercury as well as of contaminated sites.

Prohibiting requirements of the RP on mercury do not have direct cost implications<sup>7</sup> (and as such they are not of immediate interest for this cost estimation). They oblige Contracting Parties to:

- Prohibit installation of new chlor-alkali plants using mercury cells;
- Prohibit installation of vinyl chloride monomer production plants using mercury as catalyst;
- Prohibit re-entry into the market of metallic mercury from decommissioned plants;
- Prohibit opening of new, or re-opening of old mercury mining sites.

The remaining three groups of measures (progressive reduction, until final cessation, of total releases of mercury from chlor-alkali plants; ELVs for non chlor-alkali industries and other processes; and environmentally sound management of contaminated sites, wastes and remaining metallic mercury from decommissioned plants) will require specific interventions and technological upgrades (and thus have a direct cost attached to them) to ensure compliance with the Plan's provisions.

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<sup>7</sup> Indirect cost linked to implementation of these measures include for example costs of drafting and enforcing necessary legal acts.

Commitment to phase out releases of mercury from chlor-alkali plants the latest by 2020 is to be achieved by:

- Ensuring metallic mercury from decommissioned plants is managed in an environmentally sound manner;
- Progressively limiting total releases of mercury (until their final cessation) from operational chlor-alkali plants with the view not to exceed 1.0 g per metric tonne of installed chlorine production capacity in each plant; in doing so, emissions to air should not exceed 0.9 g per metric tonne of installed chlorine production capacity in each plant.

Contracting parties are to adopt (and enforce) ELVs for:

- Chemical industries using mercury catalysts;
- Batteries industries;
- Non-ferrous metal industry;
- Plants for the treatment of wastes (effluent and gaseous emissions from incineration plants).

Environmentally sound management requires measures to ensure there is no further contamination of air, soil or water from: metallic mercury remaining from decommissioned chlor-alkali plants; mercury containing wastes; and contaminated sites.

The Plan further specifies requirements regarding contaminated sites in the following manner:

- Contracting Parties are to identify sites that have been historically contaminated with mercury (including at least old mines and decommissioned chlor-alkali plants);
- Report the identified sites to the Secretariat by January 2013;
- Undertake measures (such as safety works, restrictions, or decontamination, as appropriate; apply BEPs<sup>8</sup>) to ensure environmentally sound management of these sites;
- Report in 2015 on the measures envisaged for identified sites.

Moreover, the RP on mercury requires Contracting Parties to take appropriate measures to reduce releases of mercury from other sectors (not regulated under the Plan).

The Contracting Parties need to ensure monitoring of releases of mercury into water, air and soil to verify compliance with the Plan's requirements.

The RP on mercury also requires Contracting Parties to enforce the stipulated measures.

Timetable for implementation: Prohibiting requirements of the Plan were to take immediate effect upon its adoption. Implementation deadline for phasing out existing chlor-alkali plants is 2020. As for the adoption of ELVs for non chlor-alkali industries, two sets of ELVs (50 and 5 µg/l of effluent) are to apply respectively as of 2015 and 2019. These ELVs are to be reviewed in 2015 with a view to establishing new ones in the framework of the implementation of Article 15 of the LBS Protocol. Finally, implementation deadlines for contaminated sites are 2013 and 2015.

The Parties are to report on the implementation of measures biannually.

#### **4.4 Estimating the costs of the key measures**

Technological improvements to progressively reduce and/ or eliminate total releases from chlor-alkali plants and other regulated industries and processes comprise a range of interventions. The cost of these will to large degree depend on the existing technological state of the plants, their overall environmental performance, knowledge of their employees, their production capacity, compliance

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<sup>8</sup> The Secretariat was to prepare Guidelines on BEPs

culture (i.e. degree to which the regulations are respected and enforced) and similar factors. Cost estimation is therefore possible only on a case by case basis (unless sectoral assessments for modernisation/ upgrading of certain industries have been carried out and related costs assessed), through identification of specific plants and processes that are affected by the Plan and of measures they need to implement to comply. Checklist included in Annex II of this document provides a series of questions to facilitate the process. Industries themselves might be a good source of information if they have, through planning or already made investments, considered or implemented technological and management improvements to limit releases of pollutants, in particular mercury.

Costs related to sound management of remaining metallic mercury, mercury containing wastes and contaminated sites will also highly depend on the specific characteristics of each location, in particular on size of the sites and quantities that need to be managed.

For the estimation of costs related to sound management of contaminated sites, inventory that was required for submission to the Secretariat in 2013 may be used as a starting point (provided that such an identification was completed). Alternatively, information may be retrieved from the data held by environmental authorities. Remediation plans or comparable implemented projects may be used as a basis for cost estimation.

Similarly to the situation with other Plans, assessment of costs related to monitoring and enforcement activities can be made by determining the efforts needed to sample and analyse effluents/ emissions from regulated industries, processes and sites, to control them and to enforce legal provisions.

## **5 Regional Plan on marine litter management**

### **5.1 Scope of the Plan**

The Regional Plan on marine litter management in the Mediterranean (hereinafter referred to as the RP on marine litter or the Plan) applies to the area defined in Article 3 of the LBS Protocol (paragraphs a., c., and d., i.e. the Mediterranean Sea Area, internal waters<sup>9</sup>, brackish waters, marshes and coastal lagoons, as well as groundwater communicating with the Mediterranean Sea). Moreover, the Plan applies to discharges referred to in Article 4 (a.) of the LBS Protocol (discharges from land-based point and diffuse sources and activities that may affect directly or indirectly the Mediterranean Sea Area), and any operational discharge from ships, platforms and any other man-made structures at sea.

### **5.2 Main objectives**

Objectives of the Plan are to:

- Prevent and reduce to the minimum marine litter pollution in the Mediterranean;
- Remove to the extent possible already existent marine litter by using environmentally respectful methods;
- Enhance knowledge on marine litter;
- Bring management of marine litter in the Mediterranean in line with accepted international standards and approaches.

The marine litter RP is guided by the set of principles including the principles of integration (of marine litter issues into solid waste management and other relevant strategies), prevention (requiring prevention of marine litter at source) and others (including precautionary and polluter pays principles, ecosystem-based approach, public participation and stakeholder involvement, and sustainable consumption and production).

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<sup>9</sup> Waters on the landward side of the baselines from which the breadth of the territorial sea is measured and extending, in the case of watercourses, up to the freshwater limit.

The objectives and principles of the marine litter RP mean that costs associated with this Plan will to a large extent coincide with costs related to sound management of solid waste from land-based and sea-based sources. Other costs that will arise from implementation of the RP on marine litter are the costs related to removal of already accumulated litter.

### 5.3 Key measures

The core of the RP on marine litter management are requirements set out in Articles 9 and 10 detailing measures to prevent marine litter (from land-based and sea-based sources) as well as those necessary to remove existing litter and dispose it in an environmentally sound manner.

#### 5.3.1 Prevention of marine litter

The following requirements (with implementation deadlines) are stipulated in the Plan (Article 9):

##### *For land-based sources*

1. Ensure urban solid waste management is based on reduction at source (application of waste hierarchy: prevention, preparing for re-use, recycling, other recovery – e.g. energy recovery, and environmentally sound disposal) by 2025 at latest.
2. Implement adequate waste reducing/ reusing/ recycling measures in order to reduce the fraction of plastic packaging waste that goes to landfill or incineration without energy recovery by 2019.
3. Explore and implement to the extent possible the following prevention measures by 2017:
  - a. Extended Producer Responsibility;
  - b. Sustainable Procurement Policies;
  - c. Establishment of voluntary agreements aiming to reduce plastic bags consumption and selling of appropriate products in special and reusable containers;
  - d. Fiscal and economic instruments to promote the reduction of plastic bag consumption;
  - e. Establishment of Deposits, Return and Restoration System for expandable polystyrene boxes in the fishing sector;
  - f. Establishment of Deposits, Return and Restoration System for beverage packaging prioritizing, when possible, their recycling;
  - g. In cooperation with plastics industry, establish procedures and manufacturing methodologies to minimize the decomposition characteristics of plastic, to reduce micro-plastic.
4. Establish as appropriate adequate urban sewers, wastewater treatment plants and waste management systems to prevent run-off and riverine inputs of litter by 2020.

##### *For sea-based sources*

5. By 2017, explore and implement to the extent possible ways and means to charge reasonable cost for the use of port reception facilities or when applicable, apply No-Special-Fee system; provide ships with updated information on obligations arising from Annex V of MARPOL Convention<sup>10</sup> and from applicable national legislation.
6. By 2017, explore and implement to the extent possible the “Fishing for Litter” environmentally sound practices.
7. By 2017, explore and implement to the extent possible “Gear marking to indicate ownership” concept and ‘reduced ghost catches through the use of environmental neutral upon degradation of nets, pots and traps concept’
8. By 2020 apply the cost effective measures to prevent any marine littering from dredging activities taking into account the relevant guidelines adopted in the framework of Dumping Protocol of the Barcelona Convention.

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<sup>10</sup> International Convention for the Prevention of Pollution from Ships.

9. By 2020 take the necessary measures to close to the extent possible the existing illegal dump sites on land in the area of the application of the Regional Plan.
10. Undertake enforcement measures to combat dumping in accordance with national and regional legislation including littering on the beach, illegal sewage disposal in the sea, the coastal zone and rivers in the area of the application of the Regional Plan.

### 5.3.2 Removal of accumulated marine litter and its environmentally sound disposal

Article 10 requires Contracting Parties to remove existing accumulated litter, where it is environmentally sound and cost effective (subject to Environmental Impact Assessment procedure). Priority should be given to specially protected areas and Specially Protected Areas of Mediterranean Importance (SPAMI), as well as to litter impacting endangered species. Specific measures that should be explored and implemented to the extent possible by 2019 are:

- a. Identification of accumulations/ hotspots of marine litter and implementation of national programmes on their regular removal and sound disposal;
- b. Implementation of National Marine Litter Cleanup Campaigns on a regular basis;
- c. Participation in International Coastal Cleanup Campaigns and Programmes;
- d. Application, as appropriate, of Adopt-a-Beach or similar practices and enhancement of public participation role with regard to marine litter management;
- e. Application of Fishing for Litter and ensure adequate collection, sorting, recycling and/or environmentally sound disposal of the fished litter;
- f. Charging reasonable costs for the use of port reception facilities or, when applicable application of No-Special-Fee system (when port reception facilities are used for implementing the measures provided for in Article 10).

### 5.3.3 Other measures

Other measures envisaged by the Plan include assessment of marine litter in the framework of ecosystem approach, establishment of national marine litter monitoring programmes and development of the regional one (with establishment of regional data bank by 2016), research and educational/ awareness raising activities.

Similar to other regional plans, the RP on marine litter also contains provisions on enforcement of measures to which the Parties have committed as well as on reporting (biannually).

## 5.4 Estimating the costs of the key measures

In comparison with other regional plans, the RP on marine litter is specific in terms of cost estimation due to several reasons.

First of all, the Plan envisages implementation of some measures that overlap (fully or partially) with measures required under other policy instruments. On the national level, a clear example would be national waste management legislation and strategies/ plans. On the regional level, requirement to establish adequate sewers and waste water treatment overlap with requirements of the RP on BOD from UWW. The fact that the Plan's requirements (to a certain extent, depending on specific conditions in different countries) coincide with national solid waste management frameworks can be utilised to draw information on costs for the purpose of this assessment. At the same, precautions should be taken to avoid possible duplications (e.g. assessment of costs for RP on BOD from UWW and for measure number 4 from Article 9 of the RP on marine litter – establishment of adequate urban waste water collection and treatment system).

Another specificity is linked to the fact that the RP on marine litter management allows for flexibility in determining measures that will be implemented as it leaves to the Contracting Parties to determine

what measures are feasible, cost-effective, etc. (e.g. use of formulation 'implement ... to the extent possible').

Article 7 of the Plan requires that marine litter management measures are integrated into the LBS National Action Plans (NAPs), which should include the following:

- Development and implementation of appropriate policy, legal instruments and institutional arrangements to incorporate marine litter prevention and reduction measures;
- Monitoring and assessment programmes for marine litter;
- Measures to prevent and reduce marine litter;
- Programmes of removal and environmentally sound disposal of existing marine litter according to the national legislation on management of this kind of waste; and
- Awareness raising and education programmes.

This means that key information needed for costing the Plan's implementation requirements will be identified through the NAP update when country-specific measures will be decided upon. Once set of measures to implement the Plan is agreed on the national level, the advices laid out in the following paragraphs may be used to assess the costs.

For prevention of marine litter, the bulk of costs will be related to development and implementation of adequate urban waste management strategies in the area to which the Plan applies, in particular to the investments in waste management infrastructure, equipment and organisational improvements. Existing waste management strategies and Plans should be used to the extent possible for specific figures. If such plans do not exist, attempts should be made to identify (quantify) needs for:

- upgrading of waste collection and separation systems;
- facilities to provide for waste re-use, recovery and recycling;
- appropriate disposal options;
- organisational improvements/ capacity development for waste management utilities.

The type of questions that need to be answered include: how many and what type of containers are needed, how many and what type of vehicles, how many recycling yards, what different disposal options (landfills, composting sites, incinerators, etc.) and with what capacity, how many staff needs to be employed in waste management companies, and similar. Once these are determined, costs can be assessed based on information from comparable projects, market or information from waste management utilities.

For addressing the marine litter from sea-based sources, it is important to assess the needs for infrastructural and organisational improvements for port reception facilities and in the fishing sector.

Assessment of costs related to development and implementation of appropriate legal and policy instruments (e.g. legislation, administration of specific schemes such as voluntary agreements, deposit-refund systems, fishing for litter, etc.) and of those related to educational and awareness raising activities can be approached in the following manner:

- For legal measures, the main costs elements are linked to time needed to draft the laws and implement them.
- For policy instruments, costs can be assessed by identifying necessary time to design and administer the schemes (e.g. work of civil servants), the needs for specific equipment that might be necessary (to be e.g. distributed to fishermen), level and scope of any incentives to be paid out, etc.
- Educational and awareness raising measures can be costed by e.g. determining how many people need to undergo different educational courses, what are the costs of amending curricula to include marine litter issues and of additional engagement of teachers, and similar. Public



campaigns costs can be assessed by breaking down the measures into type of communication materials, media time, work of specialized consultants etc.

Costs of removal of marine litter need to be established on case by case basis (an example of steps that might be needed is provided in Annex II of the document).

Annex II of the Plan contains detailed breakdown of tasks and timetables for implementing measures and operational targets of the Plan, and it includes cost estimates for some of the tasks (primarily those that are to be implemented on supra-national level). These can be used as a reference for estimating national costs for certain types of measures.

Moreover, *Background Document on Marine Litter Regional Plan Measures and Indicative Cost Estimation of Measures Implementation* (UNEP(DEPI)/MED WG 387/Inf. 13) contains (based on comparative practices and clean up actions) information on the costs of relevant programmes and unit costs for e.g. costs per km of beach cleaned, costs per person employed to control litter etc.) and should be used as a reference in estimating national costs in the framework of NAP update.

**Appendix I**  
**Overview of the key requirements of the analysed Regional Plans**

**Regional Plan on the reduction of BOD<sub>5</sub> from urban waste water**

Key requirements		Responsibilities/ who is affected	Measures including investments	Other measures
Art III	<ol style="list-style-type: none"> <li>1. Collect and treat UWW for all agglomerations (where &gt; 2,000 inhabitants and/or economic activities are sufficiently concentrated)</li> <li>2. Adopt and implement national ELVs on BOD<sub>5</sub> for discharges into recipient waters (as appropriate by 2015 or 2019):               <ol style="list-style-type: none"> <li>a. BOD<sub>5</sub> ≤ 50 after secondary treatment,</li> <li>b. BOD<sub>5</sub> ≤ 200 after primary treatment, while taking into account local conditions</li> </ol> </li> </ol>	<p><b>Utilities</b> and/ or <b>public administrations</b> responsible for provision of water/ waste water services in agglomerations with more than 2,000 inhabitants within the hydrological basin of the Mediterranean Sea</p> <p><b>Competent</b> environmental/ water <b>authorities</b> (monitoring, enforcement)</p>	<p>Maintenance, upgrade and/ or construction of WW collection systems (including separation of storm waters)</p> <p>Upgrade, construction and adequate operation of WWTPs</p>	<p>Monitor discharges to ensure compliance</p> <p>Enforcement activities</p>
Art IV	Commitment to implement the Regional Plan	Competent environmental/ water authorities		Prepare national programme of action with implementation deadlines
Art V	Reporting	Competent environmental/ water authorities		Biannual reports; review of the status of implementation in 2013 and 2017

**Regional Plan on the reduction of BOD<sub>5</sub> in the food sector**

	<b>Key requirements</b>	<b>Responsibilities/ who is affected</b>	<b>Measures including investments</b>	<b>Other measures</b>
Art IV	<p>1. Food industries discharging more than 4,000 p.e. shall apply BAT and/or BEP to meet the following requirements:</p> <p style="padding-left: 40px;">a. COD &lt; 160 mg/l or TOC &lt; 55 mg/l</p> <p style="padding-left: 40px;">b. BOD<sub>5</sub> (or BOD<sub>7</sub>) &lt; 30 mg/l</p> <p>ELVs may be set differently when installation discharges into sewages systems; all ELVs to be reviewed in 2015</p>	<p><b>Food industries</b> discharging more than 4,000 p.e. into water bodies (of the Mediterranean hydrological basin), including:</p> <ul style="list-style-type: none"> <li>- Dairies</li> <li>- Fruit and vegetable processing plants</li> <li>- Breweries</li> <li>- Wineries and distilleries</li> <li>- Fish processing plants</li> <li>- Sugar manufacturing</li> <li>- Vegetable oil processing</li> <li>- Canning and preserving</li> <li>- Meat processing and slaughter houses</li> </ul> <p><b>Competent environmental/ water authorities</b></p>	<p>Replacement and/ or upgrading of technologies to achieve ELVs</p> <p>Introduction and implementation of BEP</p>	<p>Monitoring to verify compliance with ELVs (internationally accepted standardized sampling, analysis and quality assurance methods to be used whenever possible)</p> <p>Enforcement</p> <p>Review of regional ELVs in 2015 based on prepared implementation reports (difficulties encountered, new developments on BAT, BEP or environmental quality standards); consider possibility to develop ELVs based on</p>
Art V	<p>Commitment to implement RP ELVs by 2014 taking into account national circumstances and capacity to implement required measures as well as the need to reduce the use of water by using BAT and BEP</p>	<p>Competent environmental/ water authorities</p>		<p>Consideration of national circumstances</p>
Art VI	<p>Reporting</p>	<p>Competent environmental/ water authorities</p>		<p>Biannual reports</p>

**Regional Plan on the reduction of inputs of Mercury**

Key requirements	Responsibilities/ who is affected	Measures including investments	Other measures	
<p>Art IV</p>	<p><b>A Chlor alkali industry</b></p> <ol style="list-style-type: none"> <li>1. prohibit new chlor alkali plants using mercury cells</li> <li>2. prohibit new vinyl chloride monomer production plants using mercury as a catalyst</li> <li>3. cease releases of mercury from the activity of Chlor alkali plants by 2020 at the latest and:               <ol style="list-style-type: none"> <li>a. ensure environmentally sound management of metallic mercury from the decommissioned plants (prohibit re-entry into the market)</li> <li>b. ensure progressive reduction (until cessation) of releases with the view not to exceed 1.0 g per mt of installed chlorine production capacity in each plant (air emissions should not exceed 0.9 g per mt)</li> </ol> </li> </ol> <p><b>B Non Chlor alkali industries</b></p> <ol style="list-style-type: none"> <li>1. ELVs for emissions from non Chlor alkali industries to be adopted: less than 50 µg/ l of effluent by 2015 and less than 5 µg/ l of effluent by 2019</li> <li>2. ELVs for mercury emissions from incineration plants – less than 0.05 mg/ Nm<sup>3</sup> in the waste gas</li> <li>3. Other sectors – reduce emissions of mercury as appropriate</li> <li>4. Isolate and contain the mercury containing wastes to avoid potential contamination of air, soil or water</li> <li>5. Identify existing sites which have been historically contaminated with mercury (at least the old mines and decommissioned Chlor alkali plants) and implement environmentally sound management measures such as safety works, restrictions or decontamination, as appropriate</li> <li>6. Non-opening of new and/ or old mercury mines</li> </ol>	<p><b>Chlor alkali industry</b></p> <p><b>Non Chlor alkali industries</b> including:</p> <ul style="list-style-type: none"> <li>- chemical industries using Mercury catalysts</li> <li>- batteries industries</li> <li>- non-ferrous metal industry</li> <li>- waste treatment plants</li> </ul> <p><b>Incineration plants</b></p> <p><b>Other sectors</b> emitting mercury</p> <p>Those responsible for <b>management of mercury containing wastes</b></p> <p>Those responsible for <b>management of contaminated sites</b></p>	<p>Upgrading and/ or replacement of technologies or introduction of BEPs in order to comply with:</p> <ul style="list-style-type: none"> <li>• requirement to phase out (by 2020) emissions from chlor alkali industry</li> <li>• ELVs for emissions from non chlor alkali industries by 2015 and 2019</li> </ul> <p>Technologies/ procedures to keep emissions from incineration plants below .05 mg/ Nm<sup>3</sup> in the waste gas</p> <p>Identify appropriate measures</p> <p>Interventions to prevent contamination of air, soil and water through mercury containing wastes (isolation, containment)</p> <p>Safety works, restrictions or decontamination of contaminated sites (at least old mines and decommiss. chlor alkali plants)</p>	<p>Monitoring of releases of mercury to water, air and soil by competent authorities or appropriate bodies to ensure compliance with ELvs</p> <p>Enforcement measures</p>

Art V	Commitment to implementation timetable			Consideration of ELVs for non chlor-alkali industries in 2015
Art VI	Reporting	Competent environmental authorities		Identification of contaminated sites in 2013 and report on envisaged measures in 2015  Biannual reports

### Regional Plan on marine litter management

Key requirements	Responsibilities/ who is affected	Measures including investments	Other measures	
Art 9	<p><b>PREVENTION</b></p> <p><u>Land-based sources</u></p> <ol style="list-style-type: none"> <li>1. Implement waste hierarchy in managing urban solid waste</li> <li>2. Reduce the fraction of plastic packaging through adequate waste reducing/ reusing/ recycling measures</li> <li>3. Extended Producer Responsibility</li> <li>4. Sustainable Procurement Policies</li> <li>5. Voluntary agreements</li> <li>6. Fiscal and economic instruments</li> <li>7. Deposits, Return and Restoration System for expandable polystyrene boxes</li> <li>8. Deposits, Return and Restoration System for beverage packaging</li> <li>9. Reduce micro-plastic</li> <li>10. Prevent run-off and riverine inputs of litter (through adequate collection and treatment of waste water)</li> </ol> <p><u>Sea-based sources</u></p> <ol style="list-style-type: none"> <li>1. Charges for the use of port reception facilities or No-Special-Fee system</li> <li>2. Fishing for Litter</li> <li>3. Gear marking to indicate ownership” concept and ‘reduced ghost catches concept’</li> <li>4. Prevent marine littering from dredging activities</li> <li>5. Close the existing illegal dump sites on land</li> <li>6. Combat dumping including littering on the beach, illegal sewage disposal in the sea, the coastal zone and rivers</li> </ol>	<p>Environmental authorities at national, regional and local level</p> <p>International and regional organisations</p> <p>Waste management utilities</p> <p>Producers, importers/ distributors and retailers (in particular products entailing plastic packaging, beverages and similar)</p> <p>Associations</p> <p>Fisheries authorities, fishermen</p> <p>Port authorities</p> <p>Water/ wastewater utilities</p> <p>Plastics industry</p>	<p>Establishment of adequate waste management system (collection, transport, treatment, final disposal)</p> <p>Establishment of adequate reusing/ recovery/ recycling system</p> <p>Upgrade of port reception facilities</p> <p>Adequate collection and treatment of waste water</p> <p>Closure of existing illegal dump sites on land</p>	<p>Design and implementation of appropriate legal and policy instruments</p> <p>Enforcement activities</p>
Art 10	<p><b>REMOVING</b> existing marine litter and its environmentally sound disposal</p> <p>Remove existing accumulated litter, where it is environmentally sound and cost effective (subject to EIA); priority to specially</p>	<p>Environmental authorities at national, regional and local</p>	<p>Removal of litter from</p>	

	protected areas, SPAMIs and litter impacting endangered species. Specifically: a. Identify accumulations/ hotspots of marine litter and implementation of national programmes on their regular removal and sound disposal b. National Marine Litter Cleanup Campaigns c. Participate in International Coastal Cleanup Campaigns and Programmes; d. Adopt-a-Beach or similar practices e. Fishing for Litter and ensure adequate collection, sorting, recycling and/or environmentally sound disposal f. Charging for the use of port reception facilities or No-Special-Fee system (when port reception facilities are used for implementing the measures provided for in Article 10).	level  International and regional organisations  Fishery authorities, fishermen  Port authorities  Communities, schools, non-governmental organisations	selected locations  Clean up campaigns	Education and awareness raising
Art 11	Assessment of marine litter	Environmental authorities at national, regional and local level		Assessments of the state and impacts of marine litter
Art 12	Monitoring Programme	International and regional organisations		National Monitoring Programme by 2017 based on ecosystem approach
Art 13	Research and scientific cooperation	Educational institutions  Research/ academic institutions		Enhance cooperation and research to improve knowledge on marine litter and minimise impacts
Art 16	Education and public awareness	Industries  Civil society		Partnerships and synergy with sustainable development initiatives in carrying out public awareness and educational activities



**Appendix II**  
**Checklists for cost estimation**

## Checklist and table for the estimation of costs of the RP on BOD<sub>5</sub> from UWW on the national level

### GENERAL DATA

1. How many agglomerations (according to the definition adopted by the Plan) are discharging urban waste water (directly or indirectly) within the Mediterranean Sea hydrological basin? List agglomerations and provide necessary data (proposal how to organize data is provided in the table below).

### COLLECTION SYSTEMS

2. Does the collecting system exist:
  - a. What is the share of population served by the existing collection system?
  - b. What is the estimated p.e. served by the collection system?
3. Identify maintenance and upgrading needs for the existing collection system:
  - a. How many km of piping needs to be replaced to prevent leaking?
  - b. How many outfalls need to be repaired/ replaced?
  - c. How many pumping stations need to be replaced?
  - d. How many km of separate storm water collection system are needed?
  - e. What other types of interventions are needed to bring the existing collection systems in line with requirements set forth in Appendix I of the Plan?
4. Identify needs for construction of new collection systems

### WASTE WATER TREATEMENT

5. Identify needs for upgrade of the existing WWTPs
6. Identify needs for construction of new WWTPs
- 7.

Agglomeration	Size (no of inhab)	Connections to sewage (share or p.e.)	WWT, if any (share of total or in p.e.)		Collection system needs				Waste water treatment needs		Unit cost	Total cost
			prim	sec	Maintain/upgrade ( km, units, p.e.)			New km or p.e.	If ELVs not met – type of intervention needed , capacity	New WWTP (capacity)		
					piping	pumps	separation					
A												
B												
C												
D												

Note: for easier management of data, excel tables may be created using this proposed template

UNEP(DEPI)/MED WG.414/5

Annex V

Appendix II

Page 2

#### MONITORING AND ENFORCEMENT

8. How many samples annually?
9. Time and equipment of enforcement authorities (inspectorates, others)?

### Checklist and table for the estimation of costs of the RP on BOD<sub>5</sub> from food sector on the national level

1. List industries from Appendix I of the RP discharging more than 4,000 p.e., directly or indirectly into the Mediterranean and provide their key characteristics; proposed format to structure necessary information for cost estimates is presented in the table below.
2. Do they discharge directly into environment or into the sewage system? Do they meet Regional Plan's (or applicable national) ELVs?
3. Identify industries and type of measures needed to comply with applicable ELVs.
4. Provide information on costs needed to implemented identified measures.

Type and name of industry (discharging > 4,000 p.e.)	Production capacity (or other indication of the size of industry, e.g. wastewater discharges in p.e.)	Discharges		ELVs met <sup>11</sup>		Select one or more measures (list below the table/ Appendix II or other applicable measures) needed to reach ELVs	Costs of applying measures (BAT/ BEP)
		Direct	Sewage	Yes	No		
<b>DAIRIES</b>							
1. Abc							
2. Def							
3. Ghi							
<b>FRUIT AND VEGETABLE PROCESS</b>							
list							
<b>BREWERIES</b>							
list							
<b>WINERIES AND DISTILLERIES</b>							
<b>FISH PROCESSING</b>							
<b>SUGAR MANUFACTURING</b>							
<b>VEGETABLE OIL</b>							
<b>CANNING AND PRESERVING</b>							
<b>MEAT PROCESSING AND SLAUGHTERING</b>							

<sup>11</sup> Provide applicable ELV, if different from those set by the RP on BOD from food sector

**List of measures leading to reduction of waste water volume and pollution load (Appendix II of the Plan)**

- A. automatic control of processes;
- B. installation of cooling circuits instead of run-through-cooling;
- C. use of vapour condensates for cleaning operations;
- D. recycling of preheated water from heat exchangers for cleaning operations;
- E. recycling of low polluted waste waters for cleaning operations;
- F. multiple use of cleaning waters;
- G. use of biodegradable cleaning agents;
- H. decentralized cleaning stations in order to shorten the pipes for cleaning agents;
- I. push away of liquid products in pipes with compressed air and vacuum instead of water;
- J. use of nitric acid for cleaning operations instead of other acids;
- K. control of product losses by continuous waste water sampling and analyses;
- L. improving the basic technology for reducing raw material losses;
- M. installation of safety mechanisms to prevent overflowing;
- N. use of peroxyacids instead of chlorine-containing cleaning agents and disinfectants to avoid generation of hazardous chlorinated substances;
- O. mechanical cleaning before cleaning with liquids and disinfection to minimize the use of cleaning agents and disinfectants;
- P. controlled discharge of waters containing disinfectants in order to protect subsequent biological treatment;
- Q. collection of product residues for further use, e.g. as feed for animals and fertilizers;
- R. separate collection and disposal of disinfectant rests and used concentrates;
- S. separate collection and treatment of fat, blood and nutrients;
- T. transportation of processed fish and sea products in a plant preferably without water;
- U. equipment of floor drains with fixed sink strainers.

*Checklist questions continued...*

- 5. What is the annual number of samples needed to verify compliance?
- 6. Enforcement staff time and equipment needed to enforce the ELVs?
- 7. Is 2015 review of the RP ELVs planned? If yes, are there any indications of the new ELVs?
- 8. Is it possible to assess what industries will be affected by the new ELVs and what level of investment will be needed to attain them?

## Checklist for the estimation of costs of the RP on mercury on the national level

### UPGRADING AND/ OR REPLACEMENT OF TECHNOLOGIES OR INTRODUCTION OF BEPs

1. Existing chlor-alkali plants
  - a. List operational plants, if any; provide capacity
  - c. Are current releases of mercury exceeding 1.0 g per mt of installed chlorine production capacity in each plant? Are air emissions exceeding 0.9 g per mt of installed chlorine production capacity in each plant?
  - b. For the plants exceeding these thresholds, are there any plans or programmes on how compliance should be achieved? If yes, take over identified measures and related costs while cross-checking (to the extent possible) existing data.
  - c. If not, identify measures (specific technological improvements, installation of equipment, etc.) that need to be implemented to comply with above requirements.
  - d. Assess the costs of implementing necessary measures (through comparative examples of plants that have already aligned their performance with standards, survey of market prices of equipment, existing assessments/ plans or similar).
  
2. Decommissioned chlor-alkali plants
  - a. Are there any such installations within hydrological basin?
  - b. If so, provide quantities of remaining metallic mercury not managed in an environmentally sound manner; environmental reports of competent authorities or records of the plants themselves may be used to this end.
  - c. Identify measures that need to be implemented to ensure environmentally sound management and break them down into specific tasks/ works.
  - d. Assess the costs for specific sites (by finding, for example, comparative examples; unit costs might be available for physical measure/ quantity of metallic mercury; alternatively, costs of implementing specific tasks/ works will need to be assessed).
  
3. Chemical industries using mercury catalysis
  - a. Determine are there any individual operational plants (and what are their capacities) in each of the following categories:
    - i. Use of mercury catalysts in the manufacture of polyurethane elastomers
    - ii. Acetaldehyde production with mercury-sulphate (HgSO<sub>4</sub>) as catalyst
    - iii. Vinyl acetate production with Hg catalysts
    - iv. Production of the cube (1-amino anthrachion) colours/pigments with Hg catalyst
    - v. Use of mercury intermediates for production of other mercury compounds
    - vi. Use of mercury intermediates in the pharmaceutical/ chemical industry
    - vii. Manufacture of mercury catalysts
    - viii. Manufacture of organic and non-organic mercury compounds

- b. Are current releases of mercury in line with the ELV of 50µg per litre of effluent?
    - c. If not, identify measures (specific technological improvements, installation of new equipment, use of know-how, improvement of management practices etc.) that need to be implemented to comply with 2015 ELV.
    - d. Identify measures that need to be implemented to comply with 2019 ELV (5µg per litre of effluent).
    - e. Assess the costs of implementing necessary measures.
4. Industries manufacturing batteries containing mercury
  - a. Determine are there any such individual operational plants (and what are their capacities)?
  - b. If yes, repeat the same questions (b – e) as under point 3.
5. Non-ferrous metal industry
  - a. Determine are there any individual operational plants (and what are their capacities) in each of the following categories:
    - i. Mercury recovery plants;
    - ii. Extraction and refining of non-ferrous metals.
  - b. If yes, repeat the same questions (b – e) as under point 3
6. Plants for the treatment of wastes
  - a. Determine are there any such individual operational plants in the hydrological basin?
  - b. If yes, repeat the same questions (b – e) as under point 3
7. Incineration plants
  - a. Determine are there any operational incineration plants that may affect directly or indirectly the Mediterranean Sea Area?
  - b. If yes, establish whether current emissions are below the limit of 0.05 mg/ Nm<sup>3</sup> of the waste gas.
  - c. If not, identify measures that need to be implemented to comply with the target.
  - d. Assess the costs of implementing necessary measures.
8. Other sectors emitting mercury
  - a. Identify any other industrial facilities or processes that cause releases of mercury into the environment and may affect directly or indirectly the Mediterranean Sea Area.
  - b. Identify appropriate measures to reduce releases of mercury from such facilities/ processes.
  - c. Assess the cost of implementing such measures

#### SITES WITH MERCURY CONTAINING WASTES

- a. Identify sites with mercury containing wastes that have potential to contaminate air, soil or water; reports of environmental authorities and other relevant documentation may be used to that end.
- b. Identify measures needed to avoid contamination; break down into tasks/ works.
- c. Assess the costs of implementing such measures.

#### CONTAMINATED SITES

- a. Identify sites contaminated with mercury in the past (as a minimum, old mercury mines and de-commissioned chlor-alkali plants); reports of environmental authorities and/ or the Report of the Contracting Party o the Secretariat (if submitted under the RP on mercury) could be used to this end.
- b. Identify measures needed to ensure environmentally sound management (e.g. safety works, restrictions, decontamination); break down into tasks/ works.
- c. Assess the costs of implementing such measures



**Checklist and table for the estimation of costs of the RP on marine litter management on the national level**

<b>PREVENTION</b>			
<b>Land-based sources</b>			
<b>Measures prescribed by the Plan</b>	<b>Deadlines</b>	<b>Appropriate national measures to implement the Plan</b>	<b>Costs</b>
Urban solid waste management is based on reduction at source	2025	<i>Details to be taken over from waste management strategies and plans, if any</i>	
		Quantified needs for upgrading waste collection and separation system	
		Facilities (e.g. separation points, transfer stations, recycling yards) to provide for re-use, recovery, recycling	
		Identification of different disposal options (e.g. landfills, incinerators, composting sites) with capacities	
		Organisational improvements in waste management utilities	
Implement adequate waste reducing/ reusing/ recycling measures to reduce the fraction of plastic packaging waste that goes to landfill or incineration without energy recovery	2019	<i>Details to be taken over from waste management strategies and plans, if any</i>	
		Identify specific measures needed to reduce, reuse and/or recycle the share of plastic packaging that goes to final disposal [if measures are already included under solid waste management, do not repeat assessment of costs]	
Extended Producer Responsibility	2017	Define the scope of scheme, identify inputs needed to design and administer	
Sustainable Procurement Policies	2017	Identify inputs needed to develop and implement policy	
Voluntary agreements to reduce plastic bags consumption and selling of appropriate products in special and reusable containers	2017	Define the scope of such schemes, determine how many would be needed. Identify inputs needed to administer each scheme if more than one are needed	
Fiscal and economic instruments to promote the reduction of plastic bag consumption	2017	Assess options, determine scope of the scheme and identify inputs needed to administer it	
Deposits, Return and Restoration System for expandable polystyrene boxes in the fishing sector	2017	Identify inputs needed to design and implement the scheme	
Deposits, Return and Restoration System for beverage packaging prioritizing when possible their recycling	2017	Identify inputs needed to design and implement the scheme [link the assessment to previously assessed re-use and recycling measures, avoid overlaps]	

Procedures and manufacturing methodologies to minimize the decomposition characteristics of plastic, to reduce micro-plastic	2017	Identify the needs to develop appropriate procedures and manufacturing methodologies	
Adequate urban sewers, wastewater treatment plants and waste management systems to prevent run-off and riverine inputs of litter	2020	Determine whether measures identified under Regional Plan on BOD from UWW are sufficient to implement this requirement. If yes, do not assess costs here. If not, identify additional measures needed to address marine litter from urban sewers and/ or WWTPs	

<b>PREVENTION</b>			
<b>Sea-based sources</b>			
<b>Measures prescribed by the Plan</b>	<b>Deadlines</b>	<b>Appropriate national measures to implement the Plan</b>	<b>Costs</b>
Charge reasonable cost for the use of port reception facilities or when applicable, apply No-Special-Fee system; provide ships with updated information on obligations	2017	Decide on the appropriate scope of national efforts to comply with the Plan; break down into tasks (e.g. upgrading port infrastructure, improve organisation) and assess costs	
“Fishing for Litter” environmentally sound practices	2017	Decide on the extent to which it is possible to implement the measure on the national level; breakdown into tasks and assess costs	
“Gear marking to indicate ownership” concept and ‘reduced ghost catches through the use of environmental neutral upon degradation of nets, pots and traps concept’	2017	Decide on the extent to which it is possible to implement the measure on the national level; breakdown into tasks and assess costs	
Prevent marine littering from dredging activities	2020	Identify needs (regulations, technical measures, enforcement) and assess costs	
Close the existing illegal dump sites on land in the area of the application of the Regional Plan	2020	Identify number of improper waste disposal sites in the area to which the Plan refers and specify the tasks/ works related to their closure	
Combat dumping in accordance with national and regional legislation including littering on the beach, illegal sewage disposal in the sea, the coastal zone and rivers in the area of the application of the Regional Plan.		Specify scope and level of enforcement activities needed to implement the requirement; identify any other possible actions to contribute to fulfilment of this requirements (as provided for in the national and regional legislation) [avoid duplication of costs of actions that might be included under other requirements]	

## REMOVAL

Example of steps that need to be taken to assess the costs of removal of accumulations/ hot spots of marine litter (if any such locations have been identified in the so far implementation of the Plan on the national level or will be identified in the course of NAP update) are provided below. Suggestions on how to estimate costs related to other removal measures required by the Plan (e.g. cleanup campaigns, fishing for litter etc.) can be found in section 5.4 of this document and in the above tables).

Article 10 of the Plan: “Where environmentally sound and cost effective, remove existing accumulated litter, subject to EIA procedure, in particular from SPAs and SPAMIs, and when impacting endangered species listed in Annexes II and III of the SPA and Biodiversity Protocol”

Prior to cost estimation, the following questions need to be considered: What is environmentally sound? What actions would environmentally sound removal entail and what are the associated costs? What is cost-effective? To determine cost-effectiveness of an action, effects (improvement to be achieved by intervention) need to be quantified. Is a unit of removed marine litter a sufficient measure of effect, or can e.g. one tone of removed litter from one location have a more significant effect than a tone removed from another?

Possible steps to enable estimation of costs and decision on the final selection of sites for which removal of accumulated marine litter will be carried out to comply with the RP on marine litter:

1. Identify sites under national jurisdictions (SPAs, SPAMIs, distribution of species from Annexes II and III) affected by accumulated litter; describe sites (include data on surfaces that need to be cleaned up, quantities of litter to be taken out and/ or similar).
2. Prioritise sites based on existing data and scientific knowledge (on the biological importance of sites, the level of threat marine litter poses to endangered species, overall impacts on affected marine ecosystems, etc.).
3. Perform EIA for priority sites.
4. Ascertain for which ones it is environmentally sound to carry out clean-up.
5. Look for comparable studies/ interventions for estimation of costs, or, if these are not available, breakdown the measure into following cost elements:
  - a. How many people, what qualifications, for how long are needed to carry out clean-up;
  - b. What equipment is needed, for how long (scuba diving, ships with adequate equipment, etc);
  - c. What ways to transport removed litter (how many boats, distances, road transport on land, etc.);
  - d. Disposal costs (per unit);
6. Calculate costs for different sites.
7. Find costs-effectiveness ratios for considered sites.
8. Select site/s with highest cost effectiveness ratios and include its/their costs in the overall cost estimation.

## **Annex VI – Presentations and training materials**

### **Contents**

- 1) Overview of the NAP process (MED POL)
- 2) Complete NAP process (MED POL)
- 3) Socio-economic assessments at regional and national levels, experiences gained through specific projects (Plan Bleu)
- 4) Exchange of best practices for cost-effective marine measures including guidance for financing opportunities under the EMFF 2014-2020 (Arcadis)
- 5) Processus Français de développement du Programme de Mesures dans le cadre de la DCSMM (France)
- 6) State of play of MSFD Programme of Measures in Spain (Spain)
- 7) Integrated management of human activities in Slovenian coastal and marine waters (Slovenia)
- 8) Economic and Social Analysis of Use and Costs of Degradation of Marine Environment and Coastal Area (Croatia)
- 9) Economic analysis, including CEA, CBA and MCA (MED POL)
- 10) Training materials on CEA, CBA and MCA (MED POL)

# Overview of the updating process for the National Action Plans (NAP)

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MED POL Focal Points Meeting on NAP Update  
11-13 May 2015, Athens



United Nations Environment Programme /  
Mediterranean Action Plan (UNEP/MAP)  
Barcelona Convention

**Horizon2020**  
CAPACITY BUILDING/MEDITERRANEAN ENVIRONMENT PROGRAMME

# Mediterranean Action Plan (MAP) 1975

Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution, 1976

Land-based Sources  
and Activities  
Protocol, 1996

11 ecosystem based ecological objectives  
for the Mediterranean (ECAP roadmap  
implementation)

Strategic Action Programme to address  
pollution from land-based sources



10 regional plans  
and 3 decisions

Qualitative objectives and operational targets

*streamlining EO5: eutrophication, EO9: contaminants, EO10: marine litter,  
while fulfilling commitments and obligations of the regional plans and the  
provisions in the framework of the SAP-MED*

# Mediterranean Action Plan (MAP) 1975

Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution, 1976

Land-based Sources and Activities Protocol, 1996

11 ecosystem based ecological objectives for the Mediterranean (ECAP roadmap implementation)

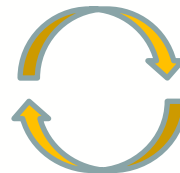
Strategic Action Programme to address pollution from land-based sources



10 regional plans and 3 decisions

Qualitative objectives and operational targets

National Action Plans  
2004-2005



National Baseline Budgets  
2003, 2008, every 5 years

Compliance, trends?

# Framework for updating the NAP

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- Article 5 of the LBS Protocol
- COP 18 Decisions in Istanbul, Turkey (2013); and
- Decision IG 18/X by COP 16 in Almeria, Spain (2008);
- The CPs were requested to:

*Initiate the process of updating their NAPs with the view to achieve good environmental status through implementation of the LBS Protocol and Regional Plans*



United Nations Environment Programme /  
Mediterranean Action Plan (UNEP/MAP)  
Barcelona Convention

**Horizon2020**  
CAPACITY BUILDING/MEDITERRANEAN ENVIRONMENT PROGRAMME



# Framework for updating the NAPs

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- ✓ Streamlining ECAP objectives and targets;
- ✓ Meeting commitments and obligations of the regional plans and legally binding requirements;
- ✓ Promoting the NAP as an important sectorial policy tool fully reflected in the Parties' development policies;
- ✓ Ensuring better complementarities between NAP priorities/targets and relevant regional and global commitments; and
- ✓ Ensuring a sustained participatory process of relevant stakeholders in particular the Horizon 2020 initiative.



United Nations Environment Programme /  
Mediterranean Action Plan (UNEP/MAP)  
Barcelona Convention

**Horizon2020**  
CAPACITY BUILDING/MEDITERRANEAN ENVIRONMENT PROGRAMME

# Framework for updating the NAPs

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- ❑ The LBS Protocol and its Regional Plans in the Framework of the SAP-MED .
- ❑ Provisions and requirements of the following legally binding measures and decisions:
  - ✓ Strategic Action Programme (SAP-MED), 1997.
  - ✓ Decision IG.19/7 “Regional Plan on the Reduction of BOD5 from Urban Wastewater”.
  - ✓ Decision IG.19/8 “Regional Plan on the Elimination of Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Mirex and Toxaphene”.
  - ✓ Decision IG.19/9 “Regional Plan on the Phasing Out of DDT”.
  - ✓ Decision IG.20/8.1 “Regional Plan on the Reduction of Inputs of Mercury”.



# Requirements of the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED

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- ✓ Decision IG.20/8.2 “Regional Plan on the Reduction of BOD5 in the food sector”.
- ✓ Decision IG.20/8.3.1 “Regional Plan on the Elimination of Alpha hexachlorocyclohexane; Beta hexachlorocyclohexane; Hexabromobiphenyl; Chlordecone; Pentachlorobenzene; Tetrabromodiphenyl ether and Pentabromodiphenyl ether; Hexabromodiphenyl ether and Heptabromodiphenyl ether; Lindane; Endosulfan, Perfluorooctane sulfonic acid, its salts and perfluorooactane sulfonyl fluoride”.
- ✓ Decision IG.20/8.3.2 “Regional Plan on the Phasing out of Lindane and Endosulfan.
- ✓ Decision IG.20/8.3.3 “Regional Plan on the Phasing out of Perfluorooctane, Sulfonic Acid, its salts and Perflourocotane Sulfonyl Fluoride.



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# Requirements of the Ecosystem Approach targets and Regional Plans in the framework of SAP-MED

---

- ✓ Decision IG.20/8.3.4 “Regional Plan on the Elimination of Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Chlordecone, Hexabromobiphenyl, Pentachlorobenzene.
- ✓ Decision IG.20/9 “Criteria and Standards for bathing waters quality”.
- ✓ Decision IG.20/10 “Adoption of the Strategic Framework for Marine Litter Management”.
- ✓ Decision IG.21/3 on the Ecosystems Approach including Adopting Definitions of Good Environmental Status (GES) and Targets.
- ✓ Decision IG.21/7 “Regional Plan on Marine Litter Management in the Mediterranean”.



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# Objectives of the NAP

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- ❑ To identify and prioritize national programmes of measures to achieve Good Environmental Status with regard to pollution-related ecological objectives under ECAP.
- ❑ Taking into consideration that:
  - Countries formulating relevant integrated programmes of measures for implementation of the 11 ECAP ecological objectives may submit their integrated programmes of measures being the NAPs

# Phased approach for development of the NAP Programme of Measures

---

I- Assessment of the midterm baseline

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# Available information in support of the NAP updating process

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- Report on midterm evaluation of SAP/NAP implementation
- Country profiles and fact sheets for each of the Mediterranean countries
- NBB 2013 and trends of levels of marine pollution
- UfM also prepared national country and regional reports with regards to the investment portfolio of NAP implementation
- MSFD initial assessment
- State of environment reports



# Key findings from the midterm evaluation of SAP/NAP implementation – regional level

---

- PAH, Mercury, Cadmium, Lead, Zinc and Chrome showed a significant reduction of discharges into the Mediterranean Sea.
- BOD5, PCB/PCT, Hexachlorobenzene, Hexachlorocyclohexane, PCDD/PCDDF, Butyltin compounds and Copper have not been achieved because an increase is observed.
- Other target substances, e.g. some POPs, could not be assessed due to the lack of NBB data.





# Key findings from the midterm evaluation of SAP/NAP implementation – legal/policy framework

---

- Over 80% of national laws and policy frameworks for the Mediterranean Countries support NAP implementation.
  - ❑ However, 43% of these laws do not provide for integrated monitoring programmes based on the ecosystem approach indicators.
- Whereas over 85% of national laws and legislation support monitoring, permitting, inspection and application of sanctions.



# Key findings from the midterm evaluation of SAP/NAP implementation – institutional setting

---

- Reporting improved, monitoring to be strengthened
- Threats from land-based sources as well as from other sources are not monitored in a regular and systematic manner.
- Compliance and enforcement focuses on traditional pollution command and control tools and does not promote the use of economic instruments for pollution prevention and control.
- Only two thirds of the Countries promote their national policies public participation in decision-making processes and protect public's right to access to environmental data and information.



## In summary, ...

---

- ✓ The NAP is a tool for Implementation of the LBS Protocol and its Regional Plans in the Framework of the SAP-MED to achieve Good Environmental Status for Pollution-Related ECAP Ecological Objectives
  - *i.e. NAP is a PoM to comply with ECAP-GES and Regional Plans targets in the framework of SAP-MED.*
- ✓ The NAPs can be viewed as the first step for preparing programmes of measures by all Mediterranean Countries for pollution prevention and control in line with the 11 ECAP ecological objectives and targets.



# Contact

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# Assessing midterm benchmark analyzing gaps, prioritizing issues and setting operational targets

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MED POL Focal Points Meeting on NAP Update  
11-13 May 2015, Athens



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# Phased approach for development of the NAP Programme of Measures

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# Objectives

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- ❑ Capture outcomes of actions taken in SAP-MED/NAP since 2005.
- ❑ Evaluate effectiveness of existing measures vis-à-vis:
  - ✓ the long-term provisions of the SAP-MED
  - ✓ 10 Regional Plans and their timetables for implementation standards
  - ✓ the GES targets of EO5, EO9 and EO10.
- ❑ Trends in pressures and their future impact on the environmental status.





# How is midterm baseline assessed?

---

-  Describe **current environmental status** vis-à-vis the underlying SAP-MED sectors and priority substances.
  -  Describe **human activities** living of the coastal and marine environment.
  -  Describe **existing measures** implemented in the framework of SAP-MED (i.e. 2005 NAPs) and RPs.
  -  Describe **expected environmental status** according to pressures, existing measures, and implemented policies.
-

# Consider answering the following questions...

---

- What are the **existing measures** (i.e. policies, strategies, plans, programmes for pollution prevention and control) that should be considered for the NAP update?
- What are the **existing sectorial or integrated operational targets** and commitments of NAP-relevance which are in place?
- What are the **trends of pollutants' loads** for key SAP MED/LBS sectors and priority substances?
- What is the most **updated list of hotspots and sensitive areas**?
- What are the **major impacts/ pressures** on marine environment and ecosystems?
- Ongoing projects and programmes**, and their prospects in terms of timing and impacts?



# In order to underpin the overall assessment with a good description of socio-economic situation, consider ...

---

- ❑ **Distribution of population and key economic sectors** and sub-sectors.
- ❑ **Direct and indirect benefits from different uses of marine environment** (e.g. revenues, employment, direct and indirect contribution to GDP, value of services provided by ecosystems, etc.).
- ❑ **Pressures from economic sectors** (e.g. size of fishing fleet, total catches, number of overnight stays of tourists, type and capacity of tourist accommodation, type and size of coastal industries) and related impacts (e.g. per sector/ sub-sector).
- ❑ **Trends in human activities** (demography, economy) with related pressures and impacts within the timespan of updated NAP.



# Consider using NAP follow-up indicators

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- ❑ MEDPOL Focal Point in their meeting in December 2014 agreed, in principle, on a number of NAP follow-up indicators.
- ❑ NAP update teams are highly recommended to base the midterm assessment, to the extent possible, on the **populated data of the most relevant indicators** from this list.
- ❑ In so doing, the selected indicators would provide:
  - ✓ A factual description of the current baseline
  - ✓ A tool for identifying gaps and underlying issues
  - ✓ A midterm baseline from NAP 2003 to 2025



# Available sources of information

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- ✓ Midterm evaluation of SAP- MED/NAP implementation report
- ✓ Country profiles and fact sheets
- ✓ National country and regional reports prepared by the UfM with regards to the investment portfolio of NAP implementation
- ✓ National state of the environment reports (2003-2013) and MSFD initial assessment
- ✓ Mediterranean state of environment reports (2009, 2011, 2012)
- ✓ ECAP sub-regional reports on pollution (MEDPOL, 2010-2011)
- ✓ Initial integrated assessment report elaborated under ECAP (2011)
- ✓ Joint report EEA-UNEP/MAP on the progress of H2020
- ✓ UNEP/MAP transboundary analysis report and hotspot reports.



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# Midterm baseline covers...

## Legislations and institutional frameworks

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Prevention and control of priority substances

Legal structures for inspection of pollutants discharges and application of sanctions in case of non-compliance

Authorization and regulation of point and diffuse source discharges

Public participation / access to information

GES targets / monitoring requirements

Requirements of 10 Regional Plans

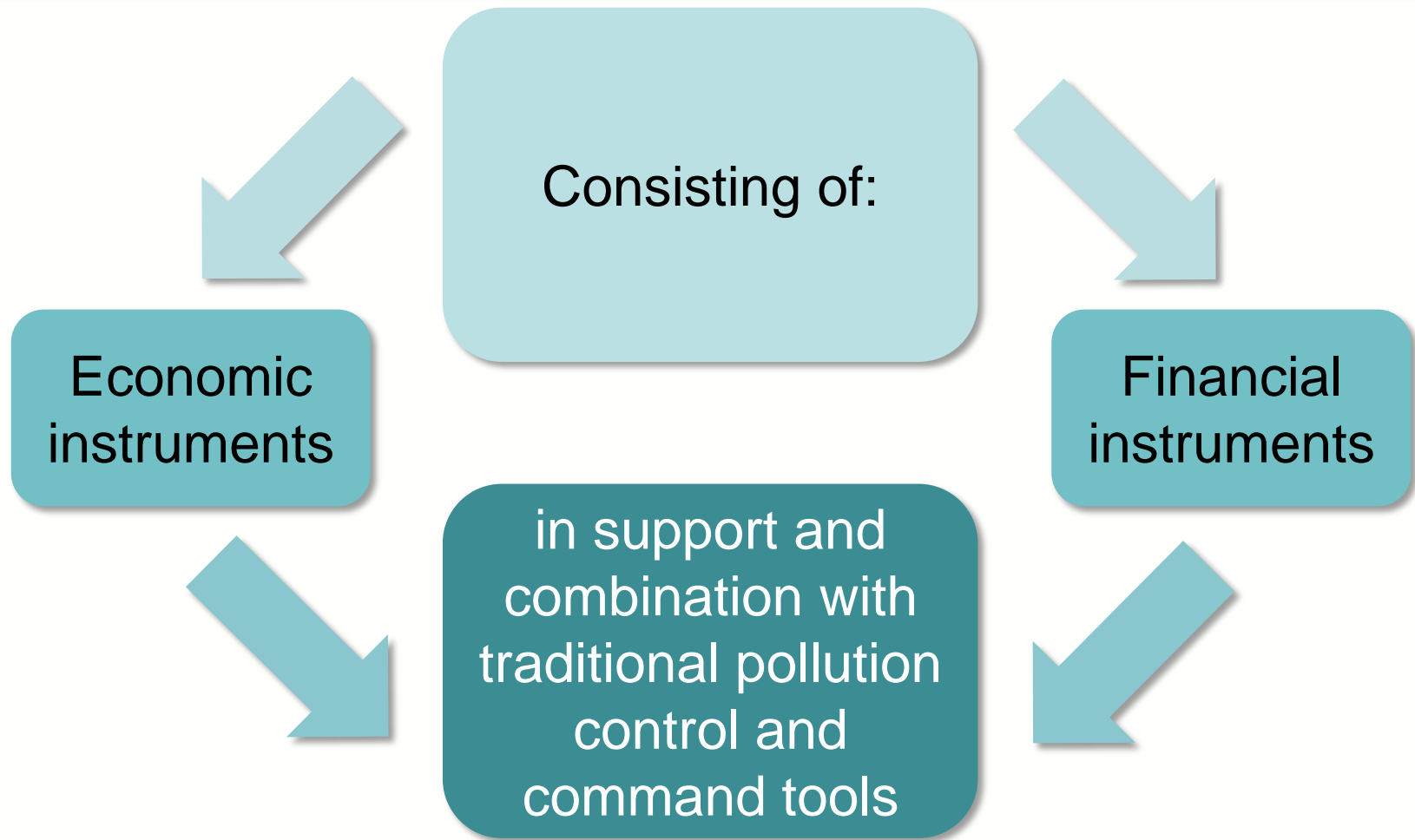
Phasing out inputs of substances included in Annex (I) of the LBS Protocol



# Midterm baseline covers...

## Economic tools

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# Midterm baseline covers...

## Policies and strategies

Strategies and action plans addressing:

- treatment and disposal of municipal sewage;
- reduction, recycling and composting of urban solid waste;
- reduction of point source discharges from industrial installations; disposal of hazardous wastes;
- safeguarding the ecosystem and maintaining the integrity and biological diversity.

Strategies that promote:

- sustainable development,
- ICZM and
- integration of environmental protection into national development policies.

Strategies that promote:

- raising public environmental awareness
- Building capacity building
- Promoting environmental policy formulation
- Strengthening institutional capability.



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# Midterm baseline covers...

## On-going technical/ investment measures

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- ❑ These may consist of:
  - ✓ Pollution prevention, control and phase-out schemes regarding releases of SAP priority substances and groups of pollutants; BAT, BEP, SCP, etc.
  - ✓ PRTR reports/ NBB reports for 2008 and 2013/ status of hotspots and sensitive areas.
  - ✓ On-going projects for pollution prevention and control



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# Phased approach for development of the NAP Programme of Measures

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# Defining the gaps

---

- ❑ The gaps are determined between:
  - GES targets/ Regional Plans requirements and SAP-MED provisions
  - and*
  - the midterm baseline.
- ❑ The presence of a gap depends on the extent to which **existing measures have been implemented** and their impact vis-à-vis the stated requirement.

# How are gaps analyzed?

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**1** → Describe the **national situation with regards to requirements** of SAP-MED and GES targets/ RPs

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**2** → **Populate** to the extent possible the list of NAP indicators including EcAp/GES

---

**3** → **Identify the gaps** between the legal requirements and the midterm baseline

---

# Gaps may be...

---

- At **legal/ institutional** levels.
- In implementation of **strategies** and achievement of existing operational targets
- In the effectiveness of pollution prevention and control **measures**.
- In **hotspots evaluation** based on updated criteria.
- **Information** gaps for optimal monitoring required under ECAP for EO5, EO9 and EO10 and other LBS Protocol requirements.



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# Identification of issues

---

- ❑ Each sector/substance has its own gaps with underlying issues behind the these gaps.
- ❑ Some of the underlying issues may be:
  - ✓ highly related to aspects for reducing pollution from land-based sources (e.g. existing operational targets, etc.)
  - ✓ completely irrelevant and should be discarded

# Need for prioritization of issues

---

- ❑ To establish a proper framework for setting realistic quantifiable/ operational targets.
- ❑ The degree of importance of each issue will depend on its impact and the significance of that impact on:
  - ✓ human health
  - ✓ marine environment
  - ✓ socio-economic losses
  - ✓ global environment.





# For prioritization of issues, please consider...

---

- ✓ Existing operational targets/measures
- ✓ New commitments with a particular focus on Regional Plans.
- ✓ Significant deviations from the GES targets for key priority contaminants and related sectors.
- ✓ List of priority contaminants currently under development.
- ✓ Higher focus on hotspots.
- ✓ Worrisome and substantive increases of pollution loads for key contaminants.
- ✓ Geographical categorization of direct and indirect releases to the marine environment



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# Why defining quantifiable objectives/ operational targets?

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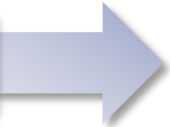
- ❑ In order to:
  - ✓ Comply with ECAP-GES and Regional Plans targets in the framework of SAP-MED.
  - ✓ Guide in elaborating potential PoM.
- ❑ A comprehensive list of key commitments and obligations stipulated in the ECAP–GES and regional plans targets in the framework of the SAP-MED has been compiled in Annex A of the NAP update document.



# How are targets set?

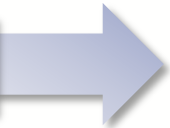
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1



- Refer to document WG414.3 (NAP Update Guidelines):
- Tables 2, 3 and 4 contain provisions of SAP-MED and requirements of Regional Plans for each EO5, EO9 and EO10.
  - Can serve as a template for ensuring that the established operational targets do address legally binding obligations and commitments.
- 

2



Formulate the national operational targets in order to meet GES targets/ Regional Plans requirements and provisions of the SAP-MED.

---

# Operational targets should be...

---

- ❑ SMART (specific, measurable, achievable, realistic and timely).
- ❑ Set at the national level, but if necessary, targets be may be also set at the regional level (i.e. river basin)



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# Operational targets maybe ...

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- ❑ Set halfway in time or phased prior to reaching the final target date.
- ❑ Similar to those required by the SAP MED, Regional Plans or EcAp GES targets in case no existing measures are implemented.
- ❑ Lower in quantifiable terms than the legally binding requirements in case the existing measures are effective in pollution prevention and control.

# Regarding economic aspects in setting operational targets...

---

- ❑ Consider:
  - ✓ Overall socio-economic conditions
  - ✓ Environmental improvements in light of economic benefits that the operational targets would bring.



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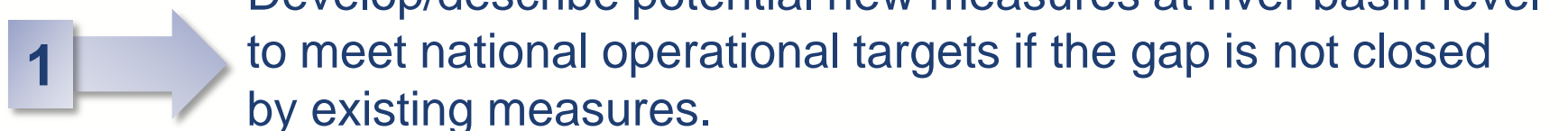
**VII- Shortlisting of measures based on agreed criteria**

**VIII- Final selection of measures for the NAP**

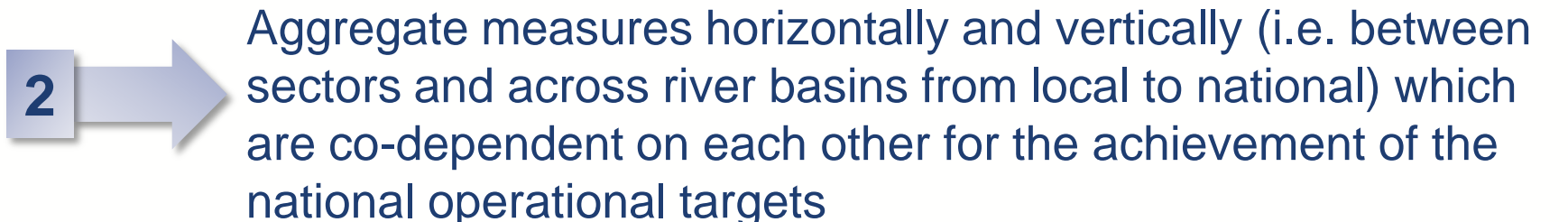


# How is the PoM developed?


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- 


1 → Develop/describe potential new measures at river basin level to meet national operational targets if the gap is not closed by existing measures.

---
- 


2 → Aggregate measures horizontally and vertically (i.e. between sectors and across river basins from local to national) which are co-dependent on each other for the achievement of the national operational targets

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- 

3 → Short list aggregated measures nationally based on agreed criteria.

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- 

4 → Integrate proposed policies into framework of existing policies and undertake economic analysis of shortlisted measures.

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- 

5 → Select final NAP PoM and elaborate in more detail 10 to 15 priority investment projects

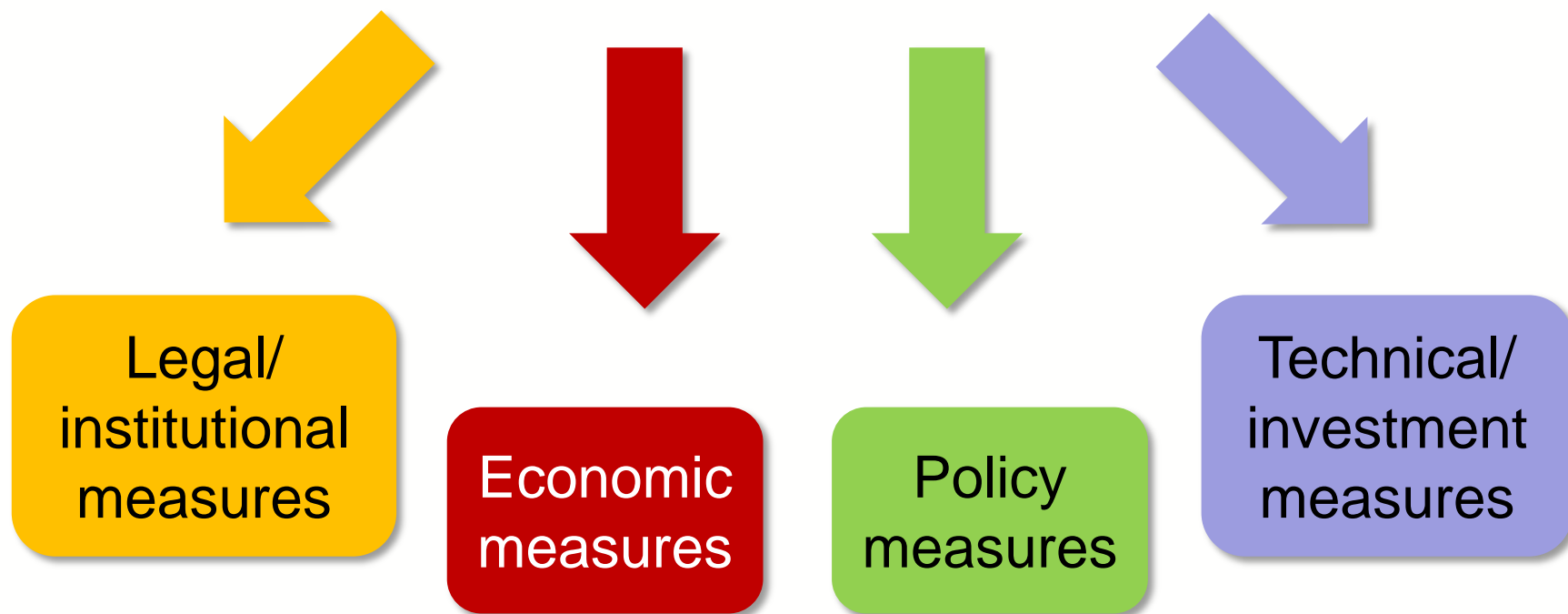
# Identification of potential measures

---

- ❑ Potential new measures can be suggested to bridge each gap (unless the gap is closed already by an existing measure).
- ❑ Measures should be first developed at the river basin level.
- ❑ Potential measures are directly linked to each operational target and related ecological objective.
- ❑ Measures may be legal, institutional, policy, economic or technical/ investment.



# TYPES OF MEASURES



# Aggregation of measures

---

- ❑ Established measures may be aggregated horizontally between sectors within a single river basin, and vertically from local to national levels (or from a single river basin to combined river basins).
- ❑ The aggregated measures are linked to the operational target noting the administrative hierarchy where the measure will be implemented (regional or local) and the type of measure (legal, institutional, policy, economic, technical/investment).



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# Aggregation of measures

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- ❑ One simple criterion to apply for aggregation is whether a single measure is dependent on another for the achievement of an operational target.
- ❑ Measures strictly of legal, institutional, policy or economic nature should be integrated into existing national/regional policy frameworks and structures; hence, strengthening these frameworks.



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# Shortlisting of measures

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- ❑ Aggregated measures can be shortlisted, prioritized and ranked based on the categories and criteria.
- ❑ Six categories are proposed:
  - ✓ Overall GES achievements;
  - ✓ Elimination of hot spots;
  - ✓ Contribution to ecological objectives;
  - ✓ Technical feasibility;
  - ✓ Geographical scope; and
  - ✓ Implementation timetable.

# Shortlisting of measures

---

- ❑ Scores from 1 to 4 are suggested with the prioritization criteria, as tabulated in Document WG.414/3.
- ❑ Measures with the highest scores are ranked first in the Shortlisted Measures and hence are candidates for economic analysis.
- ❑ It is recommended that ranking is limited to pollution prevention and control measures.



# Final selection of measures

---

- ❑ After the short-listed measures are determined, it is recommended to apply economic analysis tools such as cost-effectiveness analysis (CEA), cost-benefit analysis (CBA) and/ or multi-criteria analyses (MCA) for final selection of programmes of measures.
- ❑ Examples of questions that need to be considered and agreed upon include:
  - ✓ What specific tool (CEA, CBA or alternatives) will be used in selecting the programmes of measures and in which form (quantitative, semi-quantitative or qualitative);
  - ✓ What role will economic analysis tools play in the process; and
  - ✓ At which level should selected tool(s) be applied.





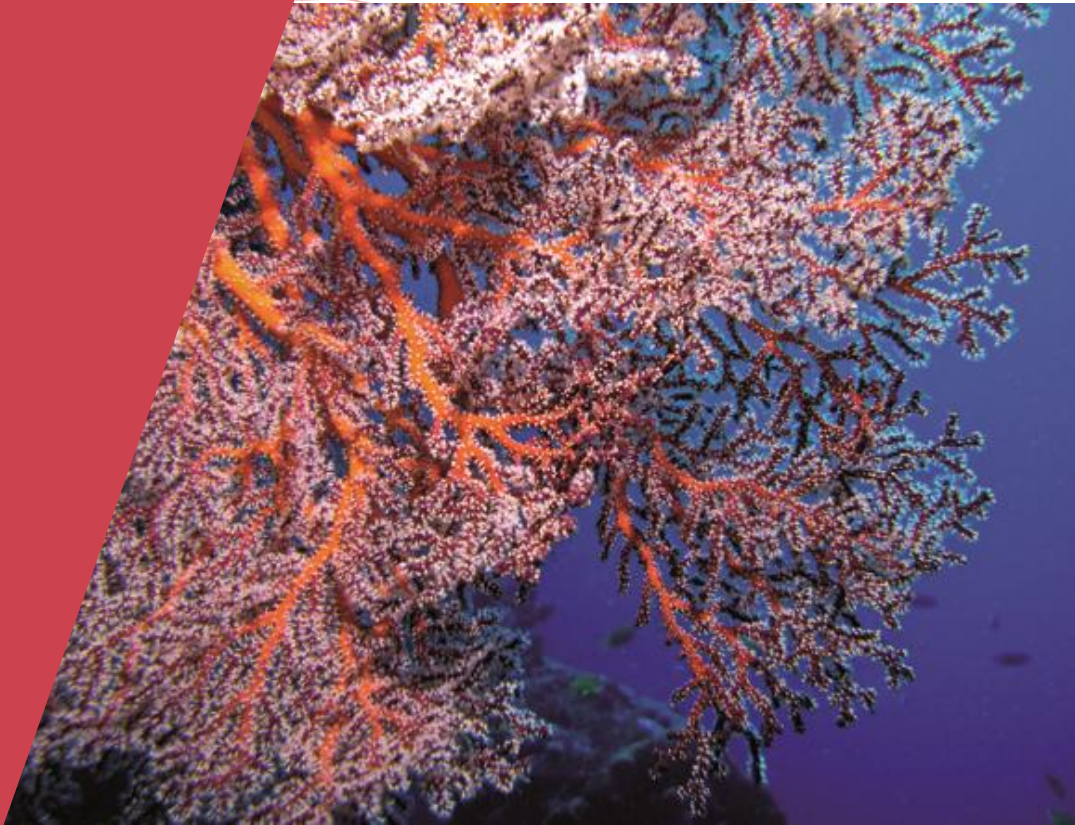
PNUE



**Socio-economic assessments at regional and national levels, experiences gained through specific projects**

**Didier Sauzade**  
Sea programme Officer

Plan Bleu pour l'environnement et le développement en Méditerranée



**Regional Meeting on applying methodology for programmes of measures and economic analysis in the NAP update**

**Athens, 11-13 May 2015**

# Plan of the presentations

- 1. Regional socio-economic analysis**
  - a. Economic and social analysis of the uses of the coastal and marine water in the Mediterranean
  - b. Scoping study of the assessment of the costs of degradation of the Mediterranean marine ecosystems
- 2. Pilot cases for national Assessment: Egypt, Lebanon, Morocco, Tunisia**
- 3. Guidelines for national Economic and Social Analysis of Mediterranean marine ecosystems, adapted to non EU Mediterranean Countries**
- 4. Presentation of the Adaptive Marine Policy Toolbox, to support elaboration of programmes of measures (PERSEUS research project)**

# 1. Regional socio-economic analysis

## Introduction

- Why an Economic and Social Analysis ?
- How it has been done under EcAp
- The EcAp ESA COR Group

## 1. Regional Analysis, objectives and methods

1.a Economic and Social Analysis of the main uses of the marine and coastal waters

1.b Regional Cost of degradation (CoD)

# Why an Economic and Social Analysis ?

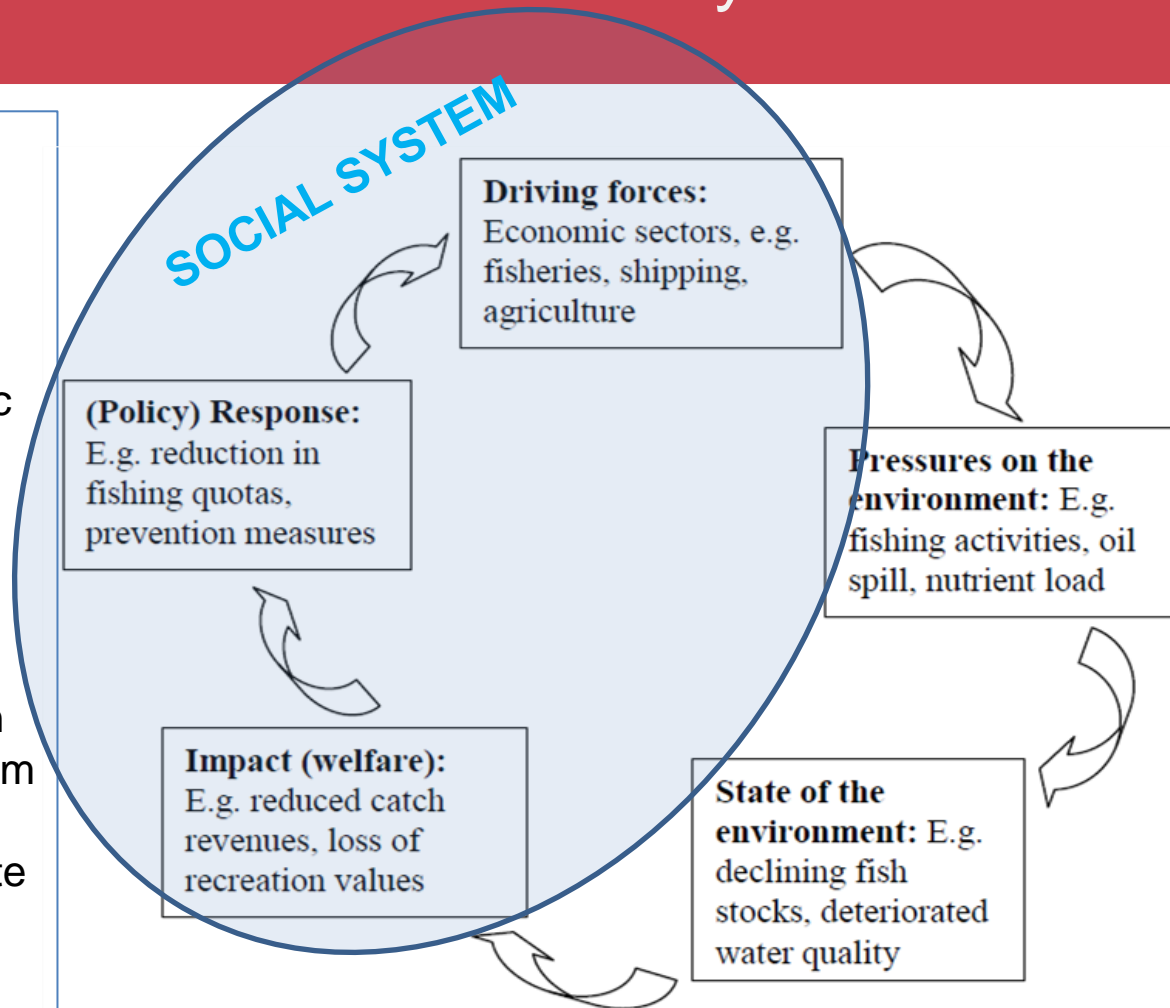
## Two aspects:

### ESA of the uses of coastal and marine waters

- Assessing their economic and social importance

### CoD

- The welfare foregone, reflecting the reduction in the value of the ecosystem services provided compared to another state (WG ESA, 2010).



# How the Mediterranean Economic and Social Analysis has been done under EcAp

**ESA: additional to the State of the Environment: Physical and chemical, Biological characteristics, Habitat, Pressures and impacts**

**Pillars of the Ecosystem Approach, better understandings of the links between human activities and natural systems, background to develop targets and to design management measures**

**A new field, calling for a pragmatic two steps approach:**

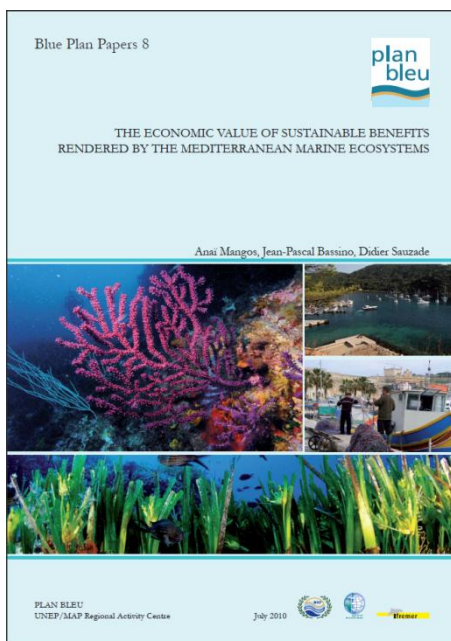
- ✓ **The Economic value of the sustainable benefits rendered by Mediterranean ecosystems (2009)**
- ✓ **An ESA inspired the MSFD ESA, adapted to the Mediterranean context (2013-2014)**

**EcAp ESA general objectives:**

- ✓ **Provide the E&S background to EcAp,**
- ✓ **Establish a common understanding and standards at different scales**
- ✓ **Develop acquaintance and appropriation of principles and methods**



**ESA COR Group**



# The EcAp ESA COR Group

## Implementation of the ESA COR Group

- Similar to COR Groups on GES – Targets and Monitoring
- Composed of national experts nominated by the Contracting Parties and international experts plus MAP components.

## Objectives

- Thematic forum, advisory committee on methodologies and approaches to select in order to achieve the ESA expected outputs
- Advise considering Mediterranean situation, e.g. socioeconomic data
- Agree on an road map, considering the COPs

## Meetings: 11-12 April 2013, 4-5 June 2014

- 15 countries represented, half non EU
- International experts, including some from the EC ESA WG



# 1. Regional Analysis, objectives and methods

- **Develop a socioeconomic analysis of marine ecosystem uses within the Mediterranean region, and assess them at sub-regional level**

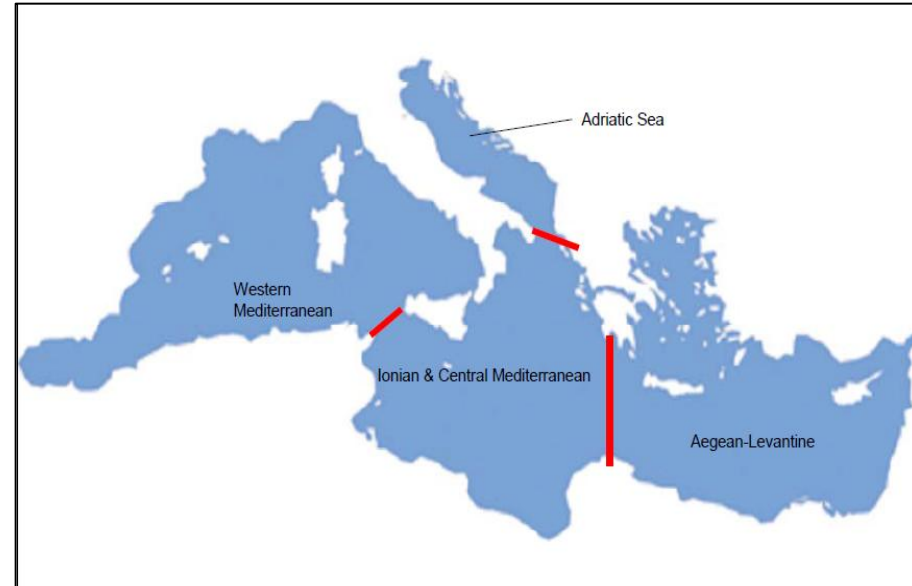
Method: Marine Water Accounts Approach, adaptation of the EC ESA WG guidance,

Focus on priority sectors:

Fisheries, aquaculture, maritime transport, recreational activities, offshore oil and gas extraction

- **Evaluate costs of degradation for human wealth in the absence of the implementation of the relevant actions plans and programmes of measures aiming to achieve or maintain GES**

Method: EC ESA WG guidance, scoping study in progress to recommend the most suitable approach



## The EC ESA WG guideline reference

•Socio-economic analysis

- ✓ Ecosystem services
- ✓ Marine water accounts

•Cost of degradation

- ✓ Ecosystem approach
- ✓ Thematic approach
- ✓ Cost-based approach

# 1.a Regional Economic and Social Analysis of the main uses of the marine and coastal waters

## Parameters, data, methods and assumptions

### Sector indicators

#### Fisheries:

Fishing effort  
Landing statistics  
Exports and imports

#### Aquaculture

Production  
Number of Farms

#### Tourism and recreational activities

International and domestic arrivals

#### Maritime Transport

Ports  
Nb vessels  
Fleet deadweigh tonnage  
Transport of goods & passengers

#### Offshore extraction of oil and gas

Oil production  
Gas production  
Active and projected fields

### Economic indicators

#### Production Value

#### Value Added



- Data sources
- Spatial disaggregation
- Assumptions, approximations

### Social indicators

#### Contribution to Employment



# Presentation of the report “Economic and social analysis of the use of the coastal and marine water in the Mediterranean”

- Characterization and impacts of 5 key human activities in the Mediterranean: Fisheries, Aquaculture, Tourism and recreational activities, Maritime transport, Offshore extraction of oil and gas

## **Structure of the activity analysis:**

- Introduction to the sector’s general context
- Regional analysis
- Sub-regional analysis
- Future trends
- Environmental impacts



# Sector : Fisheries in the Mediterranean

## GENERAL CONTEXT

- Long tradition of exploitation of fishing resources in the Mediterranean region
- Mediterranean Sea:
  - One of the world's largest and most ancient fishing grounds
  - High biodiversity
  - Few monospecific fisheries.
  - Commercial fisheries remain primarily artisanal (except. Semi-industrial fleet targeting large pelagics).
  - Fisheries target small and large pelagics, and demersal species.
  - Subject to increasingly intense anthropic pressure; fish stocks currently exploited at unsustainable levels as the result of technological advancement.
  - Since 1990s, fish catches show declining trends, particularly the most valuable species (demersal sp. and pelagic top predators).



# Sector 1: Fisheries in the Mediterranean

## RESULTS: FISHERIES THE MEDITERRANEAN REGION

### Sector indicators

GFCM, Sacchi, 2011

Region	Number of vessels 2008-2010	Vessel Tonnage 2008-2010	Fish Landings (tons) 2011
Mediterranean Sea	73 000	6 000 000	980 000

### Economic indicators

Sacchi, 2011

Region	Direct gross revenues (M Euros), 2008	Total gross revenues (M Euros), 2008	Value added (M Euros), 2008
Mediterranean Sea	3 000	10 000	2 000

Dyck and Sumaila, 2010

Region	Weight (000 Tonnes) 2009			Value (Million EUR) 2009		
	Exports	Imports	Exports-Imports	Exports	Imports	Exports-Imports
Mediterranean Sea	1 800	3 600	-1 800	4 700	10 000	-5 300

### Social indicators

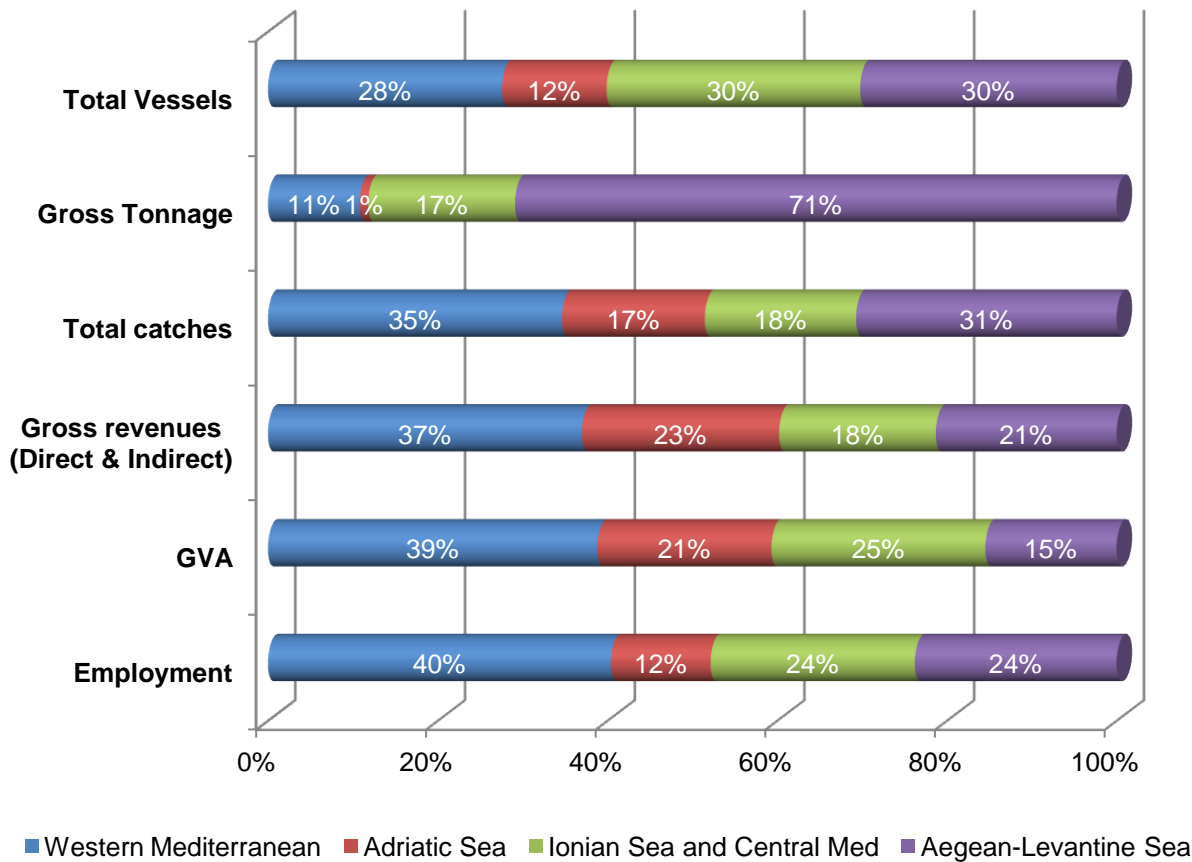
UN Data regarding  
national fisheries  
and aquaculture

Region	Direct employment (Nb of jobs), 2008
Mediterranean Sea	230 000

**Mostly artisanal**

# Sector 1: Fisheries in the Mediterranean

## Sub-regional analysis



Contrasted sector/ socioeconomic impacts in the four sub-regions:

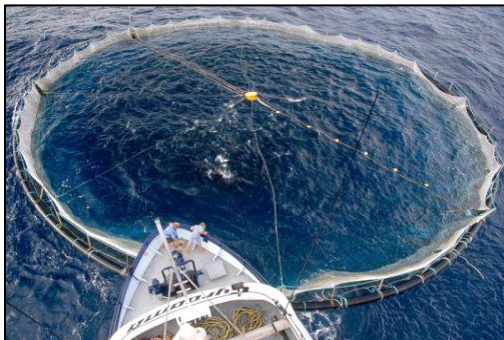
- Gross tonnage: low share of the Adriatic Sea compared to the large share of the Aegean Levantine Sea
- Gross revenues: more balanced shares among sub-regions

# Fisheries in the Mediterranean, Future trends

## The Mediterranean fisheries: facing smaller catches and an uncertain future.

### Past:

- Shift: from a primarily artisanal and coastal activity into intensive exploitation.
  - Regular rise of the semi-industrial fleet size in most areas in the 70s and 80s.
  - Huge increase of fishing capacity: vessel's power and technological equipment
  - Fishing pressure has increased rapidly
- Since 1990s :
  - ↗ from 15% to 60% of fisheries in senescent phase (Garcia, 2011).
  - declining fishing catches (15% ↘ since 2007).



Fishing activities catch more fish than can be safely reproduced, exhausting fish stocks.

### Future:

- Current fleet: 73 000 vessels (↘ in EU, ↗ in the SMC).
- Plan Bleu, 2012: shifting the fishing industry to a more sustainable scenario, maximizing sustainable economic rents. Fishing capacity ↘ by 50% ⇒ ↘ employment
- If, no action in the coming years:
  - Critical collapse of several stocks.
  - Socio-economic impacts of declining catches on trade and the livelihoods of coastal communities
  - Increase in the dependence on imported seafood
  - Environmental costs: degraded marine biodiversity and alteration of the marine trophic web, already evident: well-documented proliferation of autotrophic organisms and jellyfish
  - Uncertainties: CC and invasive species effects

# Fisheries in the Mediterranean

## ENVIRONMENTAL IMPACTS 1

EOs – ECOLOGICAL OBJECTIVE		Description of Impacts		
		Fishing activity	By-catches	Discards
EO1	Biological diversity	<ul style="list-style-type: none"> <li>Nursery areas affected.</li> <li>Mortality of seabirds, monk seals and cetaceans due to food depletion.</li> <li>Deliberate killing of monk seals and cetaceans by fishermen.</li> <li>Damage or killing of species by entanglement in fishing gears ( cetaceans, seabird s, sea turtles and monkseals).</li> <li>Illegal practices (e.g. local dynamite fishing ) causing monkseal killing and inhibiting normal trophic behaviour of other species.</li> <li>Attraction of predator species (pelagic fishes and cetaceans) by lights of fishing vessels at night.</li> </ul>	<ul style="list-style-type: none"> <li>Demersal and pelagic fisheries capturing non targeted species (chondrichthyans, elasmobranch- pelagic and demersal species).</li> <li>Accidental seabird captures in fisheries, especially for bottom and surface longliners (related to longline setting).</li> <li>Massive incidental catches of marine turtles (particularly for surface longlines, bottom trawls and gillnets, and also driftnet fleets).</li> <li>Incidental catches of cetaceans (driftnets, purse seiners and surface longlines, occasionally tuna traps).</li> </ul>	
EO2	Non - indigenous species	<ul style="list-style-type: none"> <li>Fishing gears as a vector for NIS in localised areas</li> </ul>		
EO3	Commercial species	<ul style="list-style-type: none"> <li>Severe decline of elasmobranch populations, unsustainable catches of rays including disappearance of certain taxa.</li> <li>Reduction of commercial species diversity</li> <li>Decline of fish size and abundances</li> </ul>	<ul style="list-style-type: none"> <li>Fishing on juveniles affecting population dynamics, future fish cohort.</li> </ul>	<ul style="list-style-type: none"> <li>Finning.</li> <li>Juvenile fractions suffering the most, since caught and discarded.</li> </ul>
EO4	Food webs	<ul style="list-style-type: none"> <li>Mortality of seabirds, monk seals and cetaceans due to food scarcity</li> <li>Deliberate killing of monk seals and cetaceans by fishermen.</li> </ul>		<ul style="list-style-type: none"> <li>Seabird trophic habits changed (feeding on discards).</li> </ul>

# Fisheries in the Mediterranean

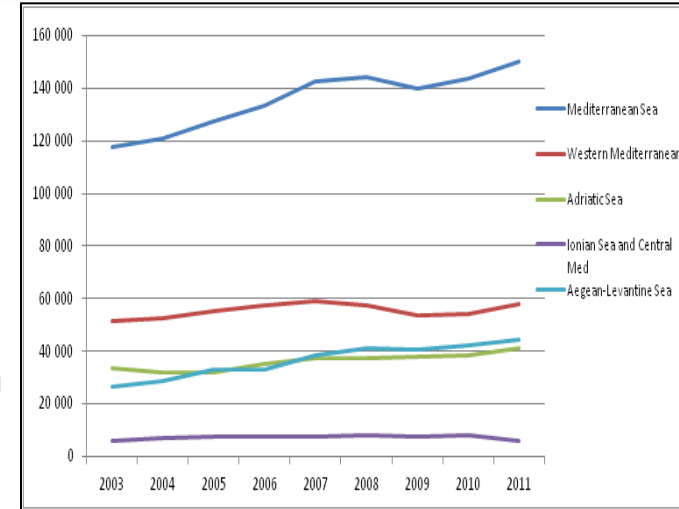
## ENVIRONMENTAL IMPACTS 2

EOs – ECOLOGICAL OBJECTIVE		Description of Impacts		
		Fishing activity	By-catches	Discards
EO6	Sea - floor	<ul style="list-style-type: none"> <li>Mechanical impacts on vegetal, coralligenous surfaces, muddy, sandy or rocky habitats and communities and direct destruction of physical support.</li> <li>Dynamite fishing: affecting all ecosystem components, also demersal.</li> <li>Changes in demersal ecosystem structure and function (trawling, bottom-otter trawling).</li> </ul>		
EO10	Marine Litter	<ul style="list-style-type: none"> <li>Litter: "networks ghost", fishing nets discharged, abandoned or lost at sea/ "domestic" litter from fishermen.</li> </ul>		
EO11	Noise	<ul style="list-style-type: none"> <li>Underwater noise generated by vessel engines.</li> </ul>		

# Tourism and recreational activities in the Mediterranean

## GENERAL CONTEXT

- Mediterranean region: World's leading tourist destination
- Tourism and recreational activities in the Mediterranean:
  - Constant growth since 1970 (400% increase in international arrivals)
  - Development following a “mass tourism” model
  - Spatially and temporally concentrated
  - Mediterranean mature destinations: NW countries
  - Tourism in the SEMC show highest growth rates during the last 20 years.
  - Vital economic role in the Mediterranean riparian countries (source of economic growth and employment)





# Tourism and recreational activities in the Mediterranean

## RESULTS:

### TOURISM AND RECREATIONAL ACTIVITIES IN THE MEDITERRANEAN

**Sector analysis 2011**  
(WTTC Country fact sheet)

Region	Coastal Mediterranean Sea (000 arrivals)		
	International	Domestic	Total
Mediterranean Sea	153 355	215 178	368 533
% World	15%	4%	6%
World	1 035 000	5 053 000	6 088 000

**Economic analysis, 2011** (WTTC Country fact sheet)

Region	Coastal gross revenues (M Euros)	Regional gross revenues (M Euros)	World gross revenues (M Euros)
Mediterranean Sea	250 786	522 260	4 239 300
	6%	12%	-

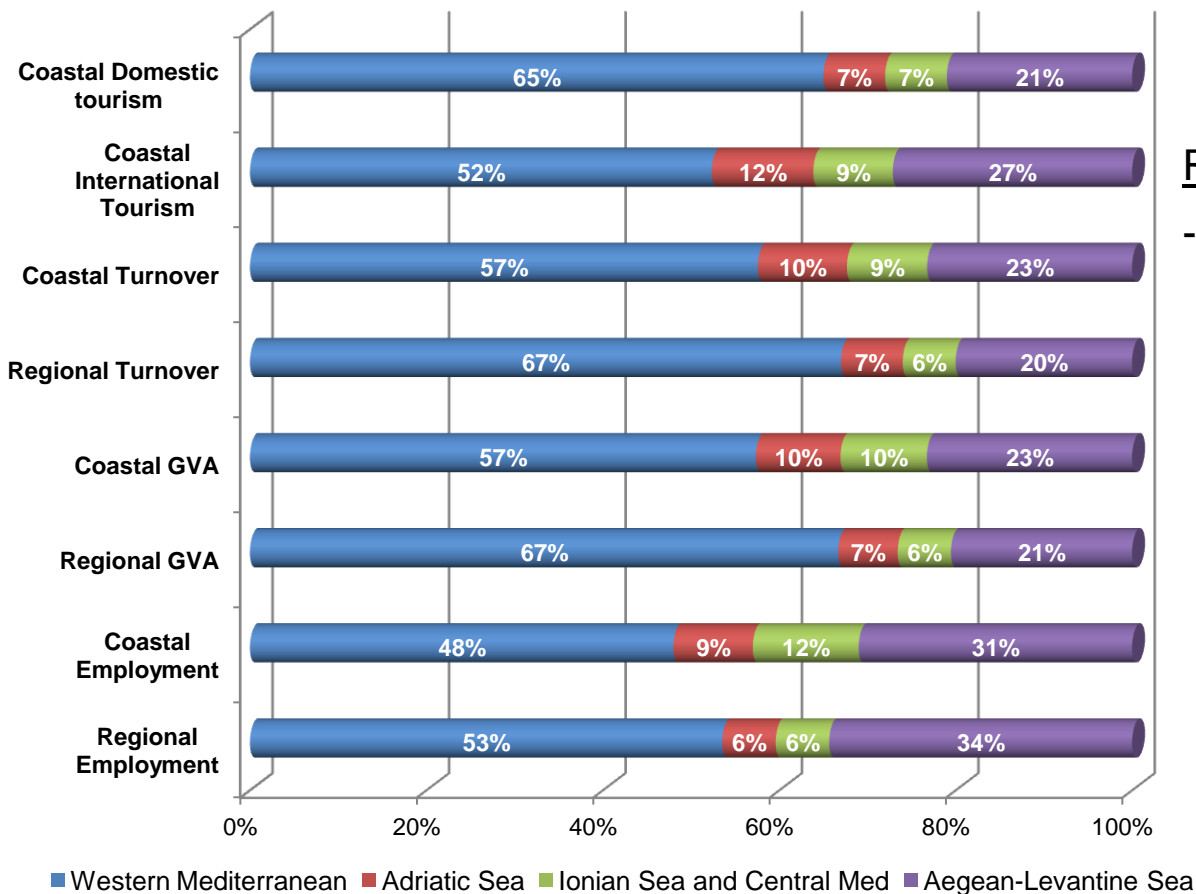
Region	Coastal GVA (M Euros)	Regional GVA (M Euros)	World GVA (M Euros)
Mediterranean Sea	135 233	282 580	2 056 600
	7%	14%	-

**Social analysis, 2011** (WWTC)

Region	Direct employment - Coastal (000s jobs)	Total employment – Coastal (000s jobs)
Mediterranean Sea	3 297	8 450

# Tourism and recreational activities in the Mediterranean

## Sub-regional analysis



### Regional versus sub regional:

- Western Mediterranean, the leading destination in the region

# Tourism and recreational activities in the Mediterranean

## FUTURE TRENDS

- Mediterranean Sea: Increasing tourist activity expected throughout the whole basin
  - Croatia, Greece, Morocco, Tunisia and Turkey present more dynamic growth patterns than mature destinations (i.e. Spain, France, Italy)
- Factors influencing tourism development:
  - Investment in tourism equipment and infrastructure, in SEMC
  - Political, social and economic stability
  - Adaptation to Climate Change effects
  - Mediterranean as a “3 S: sea, sand, and sun” destination hopefully challenged by innovative products/services such as environmental, nautical, medical, religious and cultural tourism and cruises



# Tourism and recreational activities in the Mediterranean

## ENVIRONMENTAL IMPACTS I

EOs – ECOLOGICAL OBJECTIVE		Description of impacts	
		Coastal dev. / Construction of infrastructure	Recreation
		Hotels, marinas, transport, waste water facilities	Golf courses, water sports, beach access, water parks, parking...
EO1	<b>Biological diversity</b>	<ul style="list-style-type: none"> <li>Tourist facilities mostly developing near fragile marine ecosystems;</li> <li>Altering species behaviour;</li> <li>Loss of biodiversity in coastal terrestrial and marine areas, in particular rare, endangered or endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>Bathing near turtle nesting sites;</li> <li>Disturbing and altering natural behaviours of marine species: cetaceans, seals, seabirds, turtles, etc.</li> <li>Extinction of population of certain species (e.g. Mediterranean monk seal) from areas where they were traditionally present.</li> </ul>
EO3	<b>Commercial species</b>	<ul style="list-style-type: none"> <li>Seafood consumption: pressuring on local fish populations and even contributing to overfishing.</li> </ul>	
EO5	<b>Eutrophication</b>	<ul style="list-style-type: none"> <li>Local, derived from emptying untreated waste waters directly into the marine environment.</li> </ul>	<ul style="list-style-type: none"> <li>Releases of treated/ untreated waste waters,</li> <li>Generation of a greater volume of waste water.</li> </ul>
EO6	<b>Sea - floor</b>	<ul style="list-style-type: none"> <li>Alteration of water quality (e.g. turbidity, water transparency, sediment resuspension, sediment releases) affecting benthic habitats such as seagrass meadows, coralligenous assemblages, etc., leading to their destruction.</li> </ul>	<ul style="list-style-type: none"> <li>Boating, anchoring, diving, snorkelling affects seafloor habitats, including endemic seagrass meadows and coralligenous assemblages;</li> <li>Extraction of building materials (e.g. sands) leading to erosion and destruction of habitats</li> </ul>
EO7	<b>Hydrographic conditions</b>	<ul style="list-style-type: none"> <li>Sediment stirring up;</li> <li>Development of marinas and breakwaters can cause changes in currents and coastlines.</li> </ul>	<ul style="list-style-type: none"> <li>Water shortages and degradation of water supplies;</li> <li>Excessive extraction of water can result in water scarcity. If the water comes from wells, over pumping can cause saline intrusion into groundwater.</li> </ul>

# Tourism and recreational activities in the Mediterranean

## ENVIRONMENTAL IMPACTS II

EOs – ECOLOGICAL OBJECTIVE		Description of impacts	
		Coastal/ Construction of infrastructure	Recreation
		<b>Hotels, marinas, transport, waste water facilities</b>	<b>Golf courses, water sports, beach access, water parks, parking...</b>
<b>EO8</b>	Coastal areas's natural dynamics	<ul style="list-style-type: none"> <li>Artificialisation, compactation and sealing of the coastal fringe.</li> <li>Construction of tourist facilities causing severe disturbance and erosion of the local ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Large scale beach and sand dune erosion.</li> <li>Alteration of natural beach nourishment.</li> <li>Modification of dune soils, loss of natural vegetation, disturbance of sensitive wildlife and extra demands on limited water resources.</li> </ul>
<b>EO9</b>	Contaminants	<ul style="list-style-type: none"> <li>Local, emptying sewage directly into the marine environment.</li> <li>Indirect inputs of pollutants from streams derived of torrential rainfalls.</li> </ul>	<ul style="list-style-type: none"> <li>Releases of oil and chemicals.</li> </ul>
<b>EO10</b>	Marine Litter	<ul style="list-style-type: none"> <li>Emptying wastes into the marine environment.</li> </ul>	<ul style="list-style-type: none"> <li>Releases of solid waste and littering.</li> </ul>
<b>EO11</b>	Noise	<ul style="list-style-type: none"> <li>Land-based sources of noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Noise from motor boats and jet skis, cars and buses, nightlife and other activities.</li> </ul>

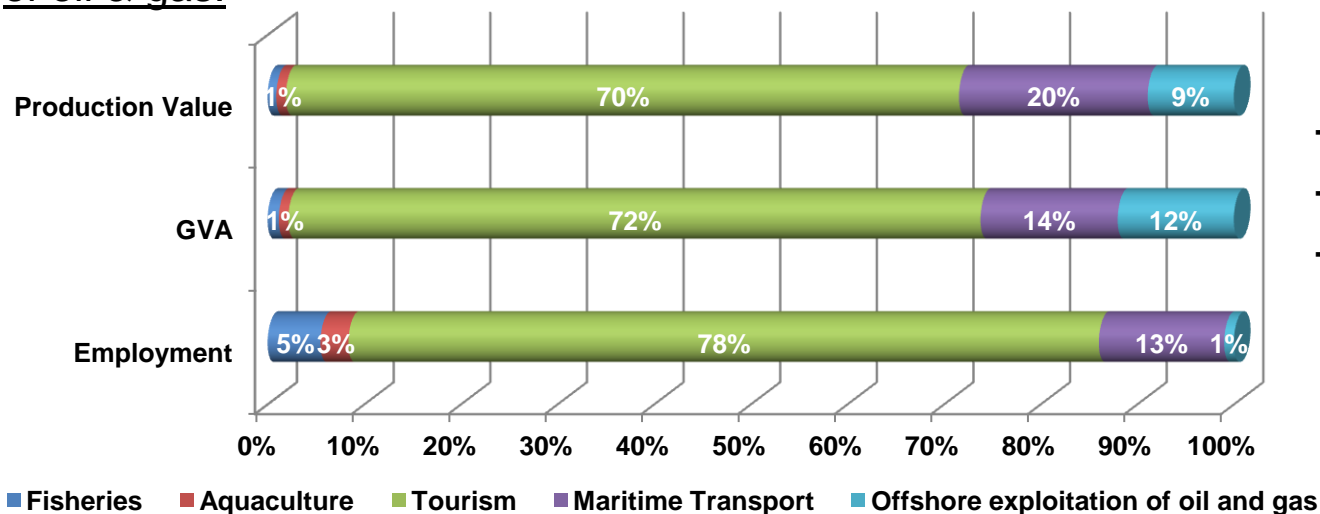
# Environmental Impacts on Marine and Coastal Ecosystems - Synthesis

Ecological Objectives (EO)		Fisheries	Aquaculture	Tourism and Recreational Activities	Maritime transport	Offshore extraction of oil and gas
		Fishing activity, bycatches and discards		Coastal dev. and construction of infrastructure and Recreation		Presence of structures and operations & Marine pollution
EO1	Biological diversity	X	X	X	X	X
EO2	Non - indigenous species	X	X		X	X
EO3	Commercial species	X	X	X		
EO4	Food webs	X				
EO5	Eutrophication		X	X	X	
EO6	Sea - floor	X	X	X	X	X
EO7	Hydrographic conditions	X	X	X		X
EO8	Coastal areas's natural dynamics			X		X
EO9	Contaminants	X	X	X	X	X
EO10	Marine Litter	X	X	X	X	X
EO11	Noise	X		X	X	X

# The Mediterranean Region – Overall results

## Main maritime Sectors in the Mediterranean region:

Fisheries, Aquaculture, Tourism & recreational activities, Maritime transport and Offshore extraction of oil & gas:



**Total revenues:** 360 billion Euros

**Total GVA:** 190 billion Euros

**Total jobs:** 4,2 million jobs.

### **Coastal Tourism**

High economic and social impacts

### **Fishing, Aquaculture**

Relatively high social impacts (employment generators)

### **Offshore Oil and Gas Industry and Maritime Transport**

High economic impacts, low contribution to employment

# 1.b Regional Cost of degradation (CoD)

Why should we assess the CoD?

- Provide a socioeconomic argument to improve the state of the environment

A difficult task as a result of the need to...

- Define projected changes in the environmental status of marine ecosystems
- Understand the links between the environmental status and economic activities

Objective: identify and discuss possible options for assessing the CoD

- What are the different methods for assessing the costs of degradation?
- What are the strengths and weaknesses of these methods?
- What could be options/ways forward to assess the costs of degradation for the Mediterranean Sea?

How?

- Review of the theoretical background and of the available literature on the CoD in the Med
- Identification of possible options for assessing the CoD of the Med
- Collation of feedbacks on these options from Mediterranean country representatives (Regional assessments and National pilot cases)



# Report available online

In French and English  
versions

For more information:

[dsauzade@planbleu.org](mailto:dsauzade@planbleu.org)



# Example: assessment of CoD by France under the MSFD

## Degradation problem areas:

-Marine litter

-Chemical co

-Oil spills

-Eutrophicatic

-Non-native invasive species

-Biological degradation

-...

## Degradation of fish stocks

### Monitoring and information costs

Spending of public authorities for fisheries sustainable management € 25.9 million

### Mitigation costs

Costs of legal decisions to temporary stop some activities €6.8 million

### Residual costs

Loss of revenues for fishermen Not quantified

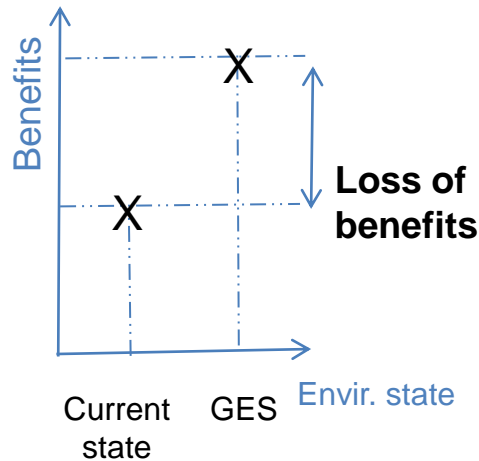
**A total CoD estimated at €2 billion in 2010, 1.06% of national GDP**

million

# Different methods for assessing CoD

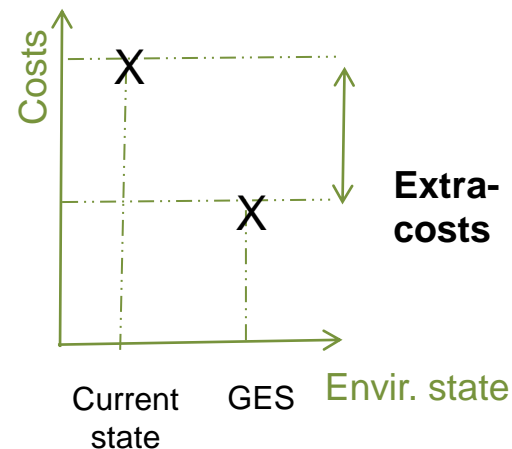
## Ecosystem services approach

Difference in values of ecosystem services provided in two different state: the GES and a degraded state.



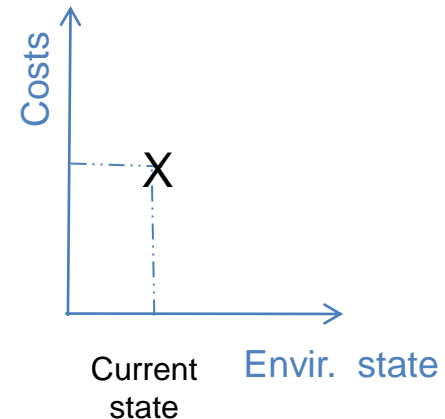
## Thematic approach

Costs arising from current environmental degradation compared to a reference situation.



## Cost-based approach

Current quantified spendings for mitigating degradation



Proxy of CoD

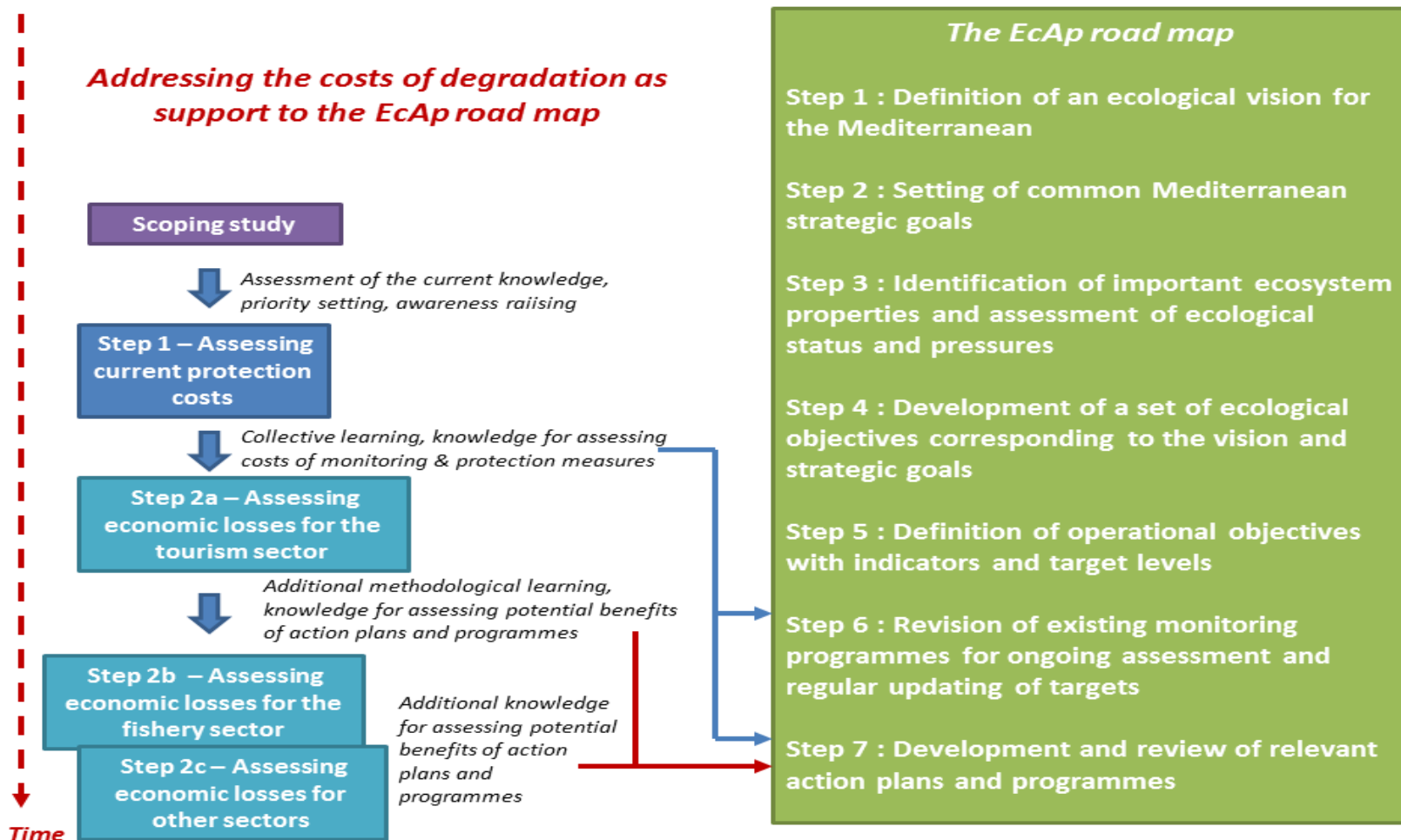
# Different methods to assess CoD

	Ecosystem service approach	Thematic approach	Cost-based approach
Main strengths	<ul style="list-style-type: none"> <li>-Provides a detailed and exhaustive overview of the CoD</li> <li>-Informs on the link between environmental health and economic activities</li> </ul>	<ul style="list-style-type: none"> <li>-Does less rely on the construction of uncertain scenarios</li> <li>-Uses a smaller range of quantitative data that are more available</li> </ul>	<ul style="list-style-type: none"> <li>-Does not rely on a reference scenario</li> <li>-Uses a smaller range of quantitative data that are more available</li> </ul>
Main weaknesses	<ul style="list-style-type: none"> <li>-Demands a lot of data</li> <li>-Relies on uncertain assumptions</li> <li>-Assesses quantitatively a part only of the proxy of CoD</li> </ul>	<ul style="list-style-type: none"> <li>-Relies on an environmental reference state that needs to be expressed for each cost</li> <li>-Assesses quantitatively a part only of the proxy of CoD</li> </ul>	<ul style="list-style-type: none"> <li>-Relies only on quantitative data that are not always easy to disaggregate at a small scales</li> <li>-Depends on the actions undertaken</li> <li>- Does not assess benefits of future policies</li> </ul>

The most useful methods for assessing future policies impacts

The most simple method from a data perspective

# CoD, further steps



# Report available online

In French and English  
versions

For more information:

[dsauzade@planbleu.org](mailto:dsauzade@planbleu.org)



## 2. Pilot cases for national Assessment within the Mediterranean Sea, conducted under the «ReGoKo» Project

- **The ReGoKo Project**
- **Objectives of the action**
- **How it has been done**
- **Results obtained**
- **Main challenges and difficulties**
- **Potential use of assessment results**

# The Regional – Governance and Knowledge generation Project («ReGoKo Project»)

« Fostering the integration of environmental issues into sectoral and development policies of the Beneficiaries »

GEF grant:  
3 million \$US

Duration:  
3 years  
(2012-mid 2015)

Beneficiaries: Egypt,  
Lebanon, Morocco,  
Palestinian  
Territories, Tunisia

Plan Bleu:  
Implementing  
agency

**A demand-oriented project...**

- ... with **5 main pillars: observation, evaluation, regulation, participation and green economy**
- ... with a **strong interest in socio-economic evaluation of maritime activities!**



# Four national pilot cases for a socio-economic evaluation of Mediterranean maritime activities

## Analyzing maritime economic activities regarding:

- their present situation and perspectives concerning their socio-economic and environmental characteristics;
- ecosystem services that support them and the pressures/ impacts they exert on marine ecosystems and human welfare;
- the cost of degradation linked to the bad state of the marine/ coastal environment;
- indications on their sustainability and development; and
- recommendations for public policies and methodological guidance for similar socio-economic evaluations in the MED by reporting to COR-ESA.

4 pilot countries:  
EG, LB, MA, TN

Implementation:  
07/2013 - 05/2015

Outputs:  
4 national reports;  
synthesis report  
with  
methodological  
guidance;  
national and  
regional  
workshops

# The consortium

## Consortium led by:

- **Mr. Nick Marchesi (PESCARES), administrative project manager**
- **Mr. Pierre Strosser (ACTeon as sub-contractor), regional coordinator**



## With national experts:

- **Ms. Nancy Kanbar (SES), Lebanon**
- **Mr. Saad Belghazi (Phénixa), Morocco**
- **Mr. Samir Meddeb (COMETE), Tunisia**
- **Mr. Hussein Abaza, Egypt**

# Results obtained

You may consult the national reports for detailed data.

- Qualitative and quantitative information has been summarized for presenting the socio-economic importance of sectors
- **For example in Tunisia**
  - **Fisheries : 41 ports, 117 000 tons of seafood products, 0.6% of GDP, 100 000 Tunisians depending directly or indirectly**
  - **Maritime transport: 8 commercial ports, one third of exports and two thirds of imports, 700 000 passengers, 6000 cruises**
  - **Coastal tourism: 7 million tourists, 6% of GDP, 96 000 direct jobs and 298 000 indirect jobs (11.5% of total employment)**
- **More illustrative with the “costs of degradation” (directly from available literature)**

# Main challenges (1)

**Availability of data is the main challenge**

Data at the right ...

... Scale

... Scope

... Time

- **Access to data (e.g. from individual operators – harbour operators, from government departments/services)**
- **Absence of dedicated statistics for the specific sectors of interest (e.g. fisheries aggregated with agriculture, wind-fields aggregated with renewable energy, etc. )**
- **Challenge with the definition of “coastal” and “marine” (where are the geographic and sectoral boundaries) => definition that depends on the sector investigated? (e.g. sources of pressures up to the water catchment, tourism more connected to the coast...)**
- **Costs of degradation – most from existing WB studies, some localized illustrations developed but challenge with data availability**

## Main challenges (2)

Another main difficulty is the comparability of the different sectors ...

- Availability of data for the same socio-economic indicator varies across different sectors
- Analyzing the socio-economic importance is not just about value-added and employment. Different socio-economic indicators capture the socio-economic importance of the sector, e.g.
  - **Maritime transport => limited employment, but strategic for the economy => share of exports/imports overall/for strategic goods**
  - **Fisheries => for traditional fisheries, employment for low income groups in coastal areas**
  - **Tourism => share in total GDP, contribution to balance of payments**
  - **Cables => share of information flows that transit through the telecommunication cables, “ supplying insurance ” (diversification of electricity sources, capacity to respond to high demands...)**

# How will the information be used?

**The results of the pilot cases have mainly indirect relevance to....**

- **Support the implementation of current legislation (Europe) and of EcAp (SEMC)**
- **Support the development of coastal & marine management strategies/ programs of measures**
- **Provide input for economic assessment (cost-benefit) of new marine/maritime projects**
- **Stress the need for and foster integrated governance (inter-ministry/sectoral working group)**
- **Support the development of new knowledge creation activities (research, studies) for enhancing the existing knowledge base**

# Download the national reports

National reports are available online:

<http://regoko.planbleu.org/en/evaluation-socio-economique-des-activites-maritimes>

GEF: Governance and Knowledge Generation  
Socio-economic Evaluation of Maritime Activities  
Mediterranean Regional Activity: Lebanon, Morocco, Tunisia  
Project ID: P118143  
Borrower/Elig No: FC004



*Etude D'évaluation Socioéconomique Des  
Activités Maritimes En Tunisie  
Décembre 2014 Rapport final*

Semir MEDOEB

Submitted by:



For more information:

<http://regoko.planbleu.org/>

[dsauzade@planbleu.org](mailto:dsauzade@planbleu.org)

[ltode@planbleu.org](mailto:ltode@planbleu.org)

### 3. Guidelines for National Assessments adapted to non – EU countries



- **Achieving GES within the Mediterranean Region involves developing action plans and measures at the national level.**
- **Conducting ESA at national level is strongly recommended.**
- **The objective:**  
Make recommendations regarding ESA at national level, particularly oriented to non-EU countries.

➤ **Guidelines are built on:**

- Available methods developed in the framework of MSFD: guidelines and analysis already carried out.
- Experience gained in socioeconomic analysis in the Mediterranean region: regional analysis and national pilot cases within the ReGoKo Project.



# Outline of the Guide

1. Introduction
  2. ESA for EcAp's implementation
  3. Definition of main key concepts
  4. ESA of the use of marine waters:
    - 4.1 Different approaches:
      - Marine Water Accounts approach
      - Ecosystem Services approach
      - Differences between the approaches and recommendations
    - 4.2 Capturing the use of marine waters:
      - Economic activities, potential indicators of importance
      - Direct uses beside economic activities, potential indicators
      - Other benefits, indirect use-values
      - Non-use values
      - Selecting the most suitable method
  5. Cost of degradation assessment
    - 5.1 Different approaches
      - Ecosystem Services approach
      - Thematic approach
      - Cost Based approach
      - Differences and recommendations
    - 5.2 Valuation methods adapted to each approaches
      - Valuations in qualitative, quantitative and monetary forms
      - Selecting the most suitable method
- ## ANNEXES
- Indicative list of human activities and uses
  - ESA Reporting Format
  - Potential data sources, adapted to the Mediterranean context

**Will be soon available on line in French and English versions**



PNUE



**Plan  
Bleu**

Plan Bleu pour l'environnement et le développement en  
Méditerranée

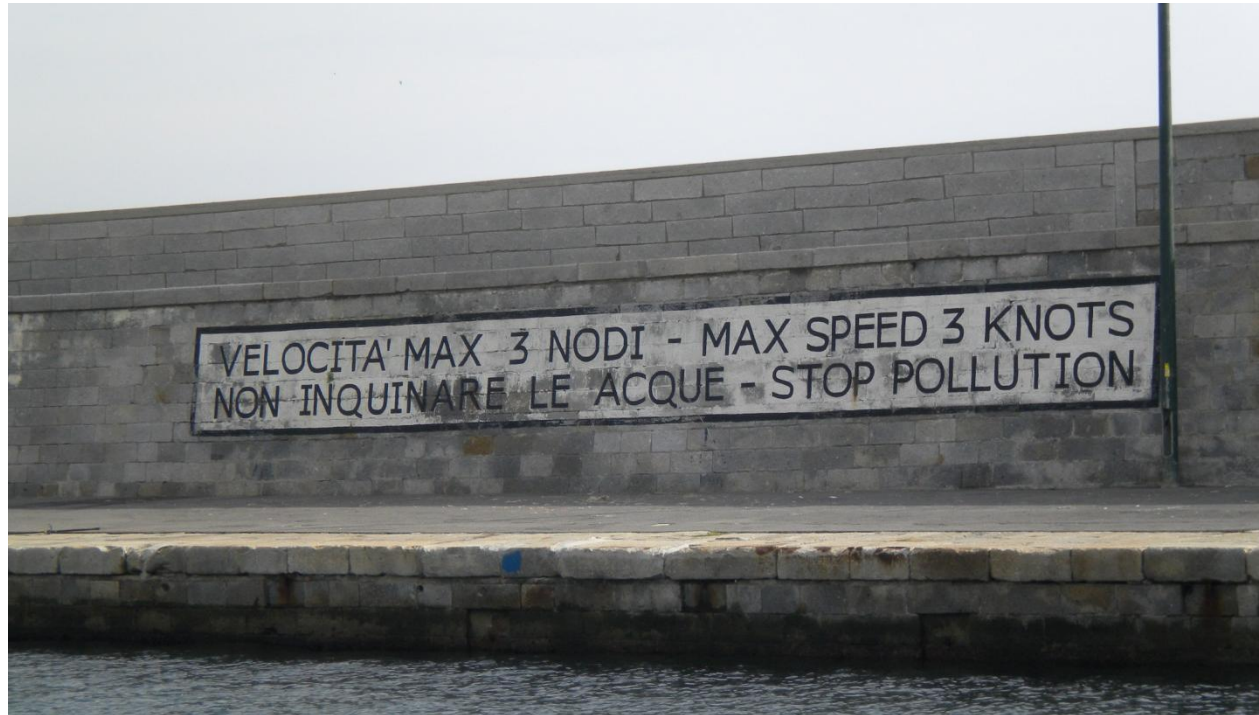


**Thank you for your attention**

[www.planbleu.org](http://www.planbleu.org)

# Exchange of best practices for cost-effective marine measures including guidance for financing opportunities under the EMFF 2014-2020

*Under Framework contract ENV.D.2/FRA/2012/0025*



Imagine the result



**BACKGROUND DOCUMENT SUMMARISING EXPERIENCES WITH RESPECT TO  
ECONOMIC ANALYSIS TO SUPPORT MEMBER STATES WITH THE  
DEVELOPMENT OF THEIR PROGRAMME OF MEASURES FOR THE MARINE  
STRATEGY FRAMEWORK DIRECTIVE**

**EC DG Environment**

**Project number BE0113000716 | version D | 26-09-2014**



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3	Starting points: MSFD CYCLE .....
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3.2	Baseline scenario (BAU) in function of CBA/CEA .....

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5.3	Recommendations .....
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# 1 Introduction

## 2 Background and objectives

- Art 13.3 of the MSFD.

Member States shall ensure that measures are cost-effective and technically feasible, and shall carry out **impact assessments, including cost-benefit analyses**, prior to the introduction of any new measure.

- **How** to assess the effects, effectiveness and benefits of measures?
- **What** does the impact assessment requirement imply (art. 13.3)?

## 2

# Background and objectives

- What are the **practical approaches** / experiences already available and lessons learned?
- How to consider a possible **link** between the economic analysis and the **initial assessment** (including the baseline)?
- How could one apply/**interpret the outcome** of the results of the economic analysis and how to deal with uncertainty?
- How to embed the economic analysis into decision making? Which **other criteria** are of importance? (e.g. stakeholder involvement)

## 3

# Starting points: MSFD CYCLE



# 4. Economic evaluation

## 4.2. CEA

### Availability of cost data

- Costs of already implemented measures can be extrapolated from the initial assessment.
  - Business as Usual scenarios and
  - the analysis of the cost of degradation

#### *Mediterranean area*

#### *Indicative cost estimation of measures*

*(Background doc on marine litter; UNEP-MAP;2013).*

- Damage from marine litter
- Cost to agriculture and aquaculture
- Costs to harbours, power stations, shipping, vessels
- Cost associated with tourism
- Cost associated with fishing and invasive species
- ...

# 4. Economic evaluation

## 4.2. CEA

### Availability of cost data

UK

*Approach for assessing costs of management measure implementation, enforcement and surveillance (IA in support of the Regional MCZ's)*

**Table 7: Eastern IFCA enforcement cost assumptions for a byelaw**

Actions required to enforce a byelaw, and unit cost assumptions	Cost estimate
Based on patrol boat rate per day: £5,500 Rigid inflatable boat (RIB) rate per day: £50 Shore-based officer rate per day: £128 For other organisations, surveillance costs per day: £125 Cost of pursuing prosecution: £1,000 per prosecution Value of fines paid: average £100 per successful prosecution (paid to HM Treasury)	Varies per rMCZ from £3,724 to £205,500

Source: Eastern IFCA, pers. comm., 2011

# 4. Economic evaluation

## 4.2. CEA

### Knowledge gaps in the driver-pressure-effect relations of MSFD measures

- Qualitative, based on expert judgment;  
*NL (CEA for MSFD; 2012)*

Measures	Effect
Fee on plastic bags in supermarkets	Reduce the second source of litter on the beach
Additional beach cleaning on non-bathing beaches (once a year)	Less litter on the beach
Adding individually recognisable markers to fishing nets and wires	Reduce illegal or improper spill of nets (the first source of litter on the beach)

## 4. Economic evaluation

### 4.2. CEA

#### Knowledge gaps in the driver-pressure-effect relations of MSFD measures

- Semi-quantitative: expert judgment within classes (1 to 5)

*France*

*3 levels of evaluation of the environmental effectiveness & 4 levels of cost-effectiveness  
(IA in support of the PoM MSFD; 2014)*

- Semi-quantitative: expert judgment with scales

(„+++” to „---”)

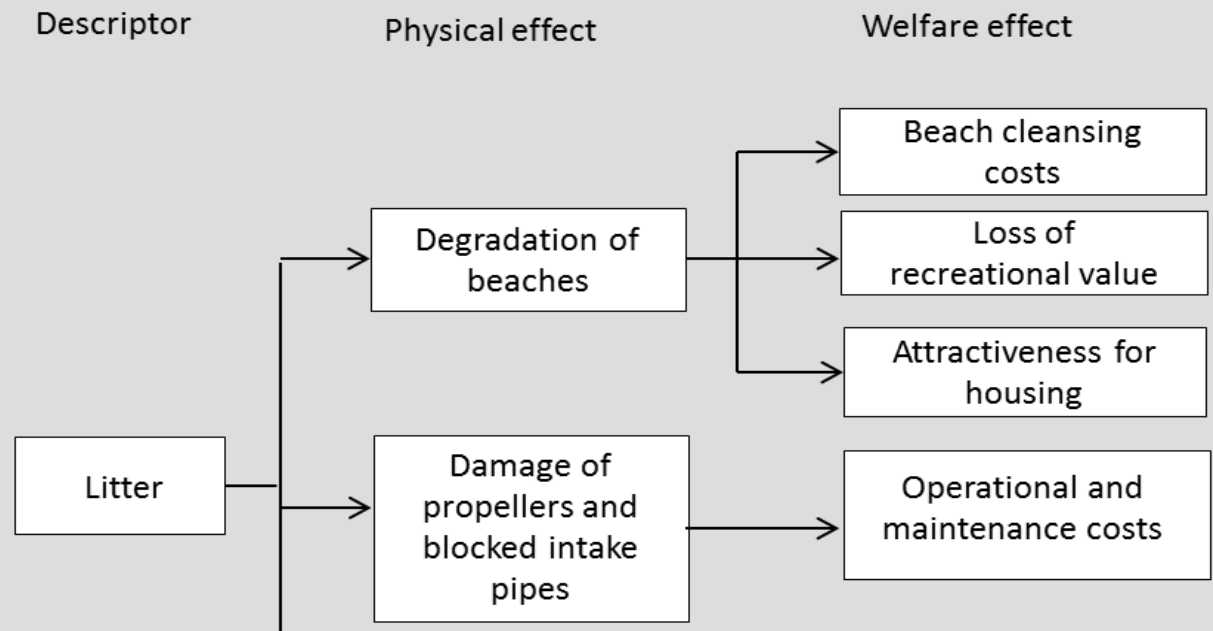
# 4. Economic evaluation

## 4.3 Impact assessment including CBA

### Identification of benefits

- Lack of knowledge on the links between potential measures, improvement of marine ecosystems and corresponding economic and social value

### *NL: Logical Diagrams of Impact (LDI)*



## 4. Economic evaluation

### 4.3 Impact assessment including CBA

#### Feasibility and limitations of potential methods to monetise effects

- Choice Experiments can be used to estimate a willingness to pay value
- Avoided damages or market prices method
- Use / non use values

#### *Latvia*

*Valuing benefits of reaching the MSFD targets  
by applying the 'Choice Experiment' Method*

*The estimated mean WTP for achieving the GES state is 5.7  
LVL (8.1 EUR) per person per year*

#### *DE*

*Development of a socioeconomic valuation scheme  
linking pressures and sectors with use and non-use  
values*

## 4. Economic evaluation

### 4.3 Impact assessment including CBA

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- Choice Experiments can be used to estimate a willingness to pay value
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LVL (8.1 EUR) per person per year*

#### *DE*

*Development of a socioeconomic valuation scheme  
linking pressures and sectors with use and non-use  
values*

Pressure		Use Values									Non-use values	
		Direct use values (consumptive)			Direct use values (non-consumptive)				Indirect use values	Option values	Altruistic existence heritage values	
		Fisheries	Angling	Aquaculture	Tourism	Recreation	Shipping	Industry	Health	Agriculture	All affected sectors	Society
Physical loss	Smothering	✓	✓		(✓)	(✓)					✓	✓
	Sealing											
Physical Damage	Siltation	(✓)	(✓)				✓				✓	✓
	Abrasion	✓	✓								✓	✓
	Selective Extraction	✓	✓		(✓)	(✓)					✓	✓



# MESP

MARINE ECOSYSTEM SERVICES PARTNERSHIP

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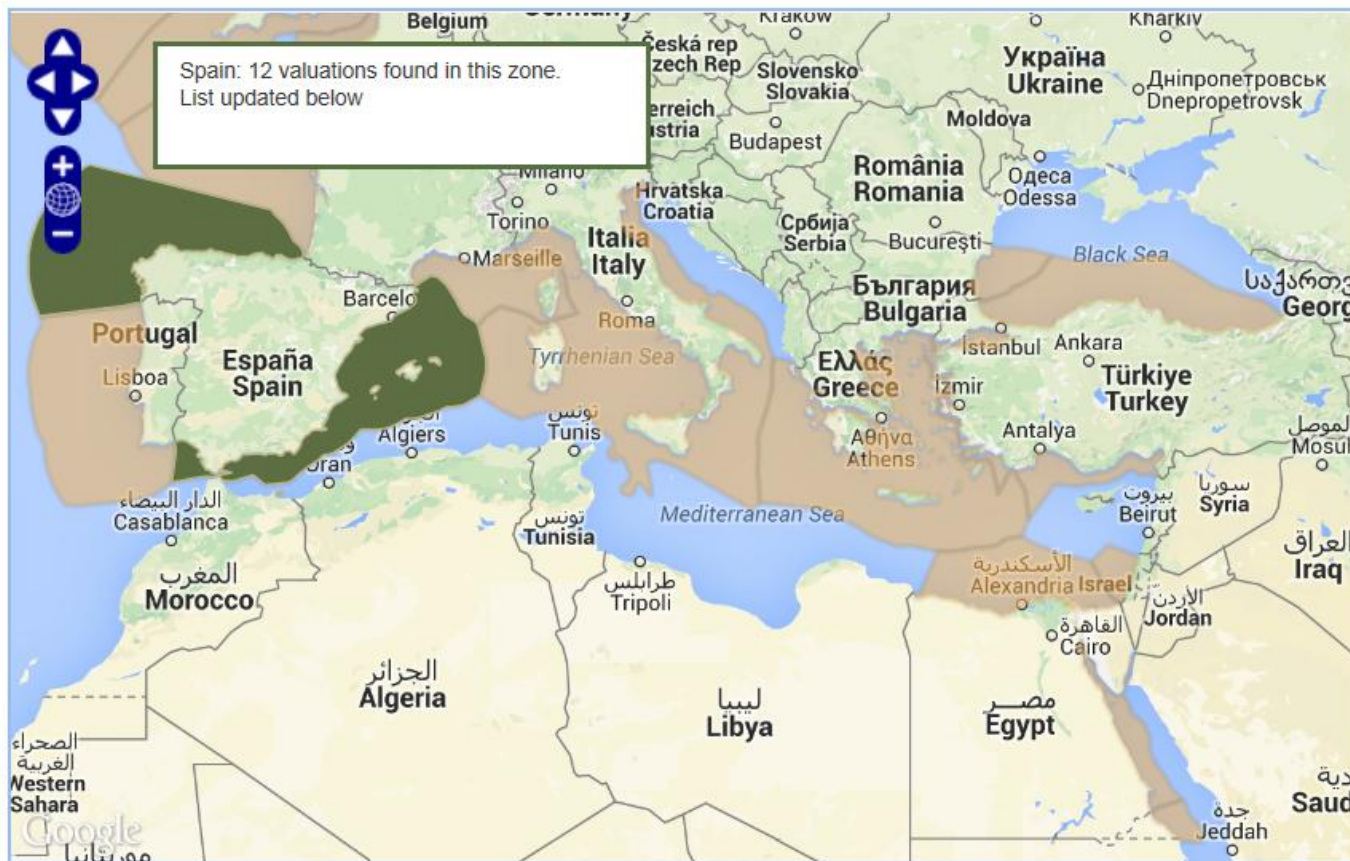
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### Locate Ecosystem Services Valuation

#### Getting Started

When the map loads, all countries with v studies are highlighted in gold. Clicking coastal zones in the will select that coun show ecosystem service studies in the g the map.

Click to expand the panels below and dis areas based on Ecosystem type or a spe Exclusive Economic Zone. The map will u show the zones which fit this criteria. Use key to select multiple rows.

Selecting items from the grid at the botto page places them on the map and offers details, with a *more* link to see the compl

Exclusive Economic Zones

Ecosystem Type

Valuations listed below: 12

Subset: Spain

Click on column headers to sort and group results.

Reset and show all re

# 4. Economic evaluation

## 4.3 Impact assessment including CBA

### Feasibility and limitations of potential methods to monetise effects

#### *Mediterranean*

*Economic study of impacts of marine and coastal protected areas (Mangos A, et al; 2013).*

Table 4. Present value of benefits and costs from 2010 to 2030 (in thousands of €)

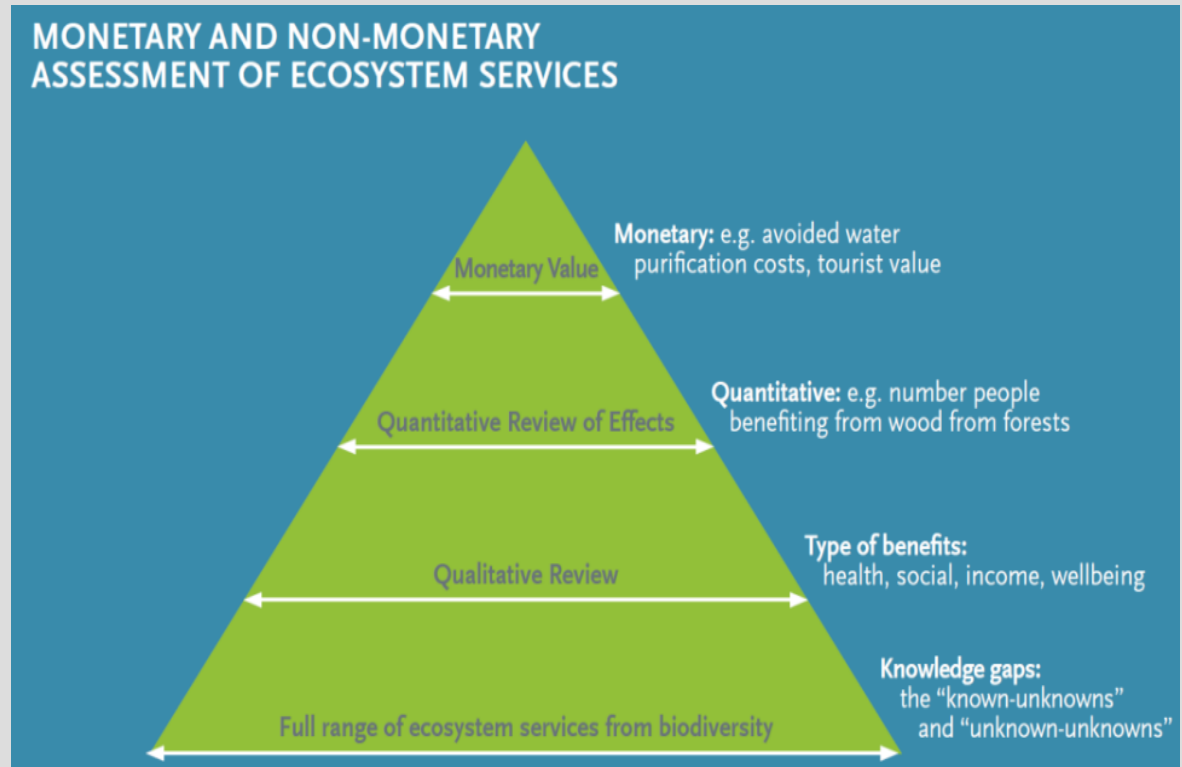
		Scenario 1	Scenario 2	Scenario 3
Benefits present value	Commercial fishing	30,915	32,312	29,953
	Recreational fishing	2,334	503	2,614
	Tourism	14,020	15,519	15,182
	Scuba diving	440	460	446
	CO <sub>2</sub> sequestration	2,809	2 913	2,600
	<b>Total</b>	<b>50,517</b>	<b>51,707</b>	<b>50,794</b>
Costs present value	Budget de fonctionnement	164	283	27
	Dépenses de surveillance	0	193	0
	Dépenses d'éducation à l'environnement	0	249	0
	<b>Total</b>	<b>164</b>	<b>726</b>	<b>27</b>
<b>Net present value</b>		<b>50,353</b>	<b>50,981</b>	<b>50,767</b>

# 4. Economic evaluation

## 4.3 Impact assessment including CBA

### On alternatives for CBA

The problem



## 4. Economic evaluation

### 4.3 Impact assessment including CBA

#### On alternatives for CBA

#### The solution

*FR*

*MCA based on 4 criteria + approach of economic,  
social & environmental impacts*

*Latvia*

*MCA based on 11 criteria*

**Table 4.1 Assessment categories (with 5-category scale) for the criteria used in the analysis.**

Criteria	Specifications of the categories
1. Cost-effectiveness (CE)	For the effectiveness: from 1 “very low load reduction efficiency” to 5 “very high load reduction efficiency”, for the direct (financial) costs: from 1 “very high” to 5 “very low”. (Further quantitative specifications for the categories are developed, see the chapter 4.4). A matrix is used for deriving CE scores (see the chapter 4.4.4).
2. Time until effect	From 1 “long” to 5 “short” (although the measures were not assessed with this criterion).
3. Multiple effects	From 1 “low multiple effects” to 5 “high multiple effects” (further specification for the categories is developed, see the chapter 4.6).
4. Economic costs	For the ‘economic costs’: from 1 “very high” to 5 “very low”. For the ‘economic gains’: from 1 “very low” to 5 “very high”.
5. Administrative costs	From 1 “very high” to 5 “very low” (although measures could not be assessed with these categories due to lack of information).
6. Indirect costs and wider negative socioeconomic impacts	“Low” / “Moderate”/ “High” possible negative impacts. Indication of considerable possible distributional impacts.
7. Certainty of the effectiveness and costs’ assessments	For both the effectiveness and costs: from 1 “very low” to 5 “very high” certainty (further specification for the categories is developed, see the chapter 4.10).
8. Socioeconomic benefits from environmental improvements	From 1 “low possible benefits” to 5 “high possible benefits”.
9. Availability of enforcement scheme(s)	From 1 „not existing” to 5 „fully operational”.
10. Acceptance by stakeholders	From 1 „low” to 5 „high”.
11. Certainty in funding availability	From 1 „low” to 5 „high”.

# 5 Embedding economic analysis in the decision- making

## Stakeholder involvement

*FR*

### *Stakeholder process within the MSFD cycle*

- inventory of existing measures
- workshop to discuss how measures contribute to GES
- ideas of new measures and local discussions
- workshop on technical and legal feasibility of new measures

## Other criteria of relevance for PoMs development

*FR*

### *Coordination of MSFD-WFD measures*

- Set milestones for both directives Review existing measures Determine where the pressures occur in transitional or marine waters
- Assess which targets are adequate and which ones are not

# Q & A

- Your turn!



# Q & A

- Your turn!





---

# PROCESSUS FRANCAIS DE DEVELOPPEMENT DU PROGRAMME DE MESURES DANS LE CADRE DE LA DCSMM

*Mardi 12 mai 2015, Athènes*

*Léa DALLE GERARD  
Ministère de l'écologie, du développement durable  
et de l'énergie*



# *Plan de la présentation*

---

- 1. Contexte général*
- 2. Contexte de la mise en œuvre du programme de mesures*
- 3. Principales étapes de l'élaboration, calendrier associé*
- 4. Réalisation de l'étude d'incidence*
- 5. Exemples de mesures nouvelles*



---

# ***1. Contexte général***



# La directive-cadre “stratégie pour le milieu marin”

**Directive 2008/56/CE** du 17 juin 2008 établissant un cadre d’action communautaire dans le domaine de la politique pour le milieu marin (DCSMM)

Elle conduit les États membres de l'Union européenne à **prendre toutes les mesures nécessaires pour réduire les impacts des activités humaines sur le milieu marin** afin de réaliser ou de maintenir un **bon état écologique des eaux marines au plus tard en 2020**.

→ Pilier environnemental de la politique maritime intégrée de l’Union européenne, qui favorise une approche intégrée de la gestion du milieu marin

## 5 éléments de la stratégie :

- évaluation initiale, définition du bon état écologique et objectifs environnementaux (2012)
- programme de surveillance (2015)
- **programme de mesures** (2016)

---

## ***2. Contexte de la mise en œuvre du programme de mesures***



# Constat et mise en oeuvre

---

Les **mesures existantes** au titre des diverses politiques existantes **ne permettent pas d'atteindre l'ensemble des objectifs environnementaux** d'ici à 2020

→ Il est nécessaire d'envisager l'adoption de **mesures nouvelles**

→ Mesures prises au titre de la DCSMM ou au titre d'autres politiques publiques dans l'objectif d'atteinte du bon état écologique (DCE par exemple)

Sous l'égide de la Commission européenne, les Etats-membres ont élaboré une recommandation sur l'élaboration des programmes de mesures DCSMM, adoptée en décembre 2014.

La directive requiert que ces mesures fassent l'objet d'une **étude de leur incidence**

---

### ***3. Principales étapes de l'élaboration du programme de mesures, calendrier associé***



# Les grandes étapes du processus d'élaboration (1/2)

---

- Recensement des **mesures existantes** au niveau des sous-régions marines mises en œuvre dans le cadre d'autres politiques publiques (1<sup>er</sup> semestre 2013)
- **Analyse de la suffisance et de l'efficacité** des mesures existantes et identification de pistes de mesures nouvelles – travaux au niveau des sous-régions marines puis ateliers nationaux (juin 2013)
- Atelier de **restitution avec les acteurs et parties prenantes** (été 2013) et projet de liste consolidée de **mesures complémentaires**
- Analyse au niveau national de la **faisabilité technique et juridique** des pistes de **mesures nouvelles** proposées par les sous-régions marines (septembre 2013)
- Sélection au niveau national des **mesures nouvelles techniquement faisables à soumettre à étude d'incidence** économique, sociale et environnementale (octobre 2013)



# Les grandes étapes du processus d'élaboration (2/2)

---

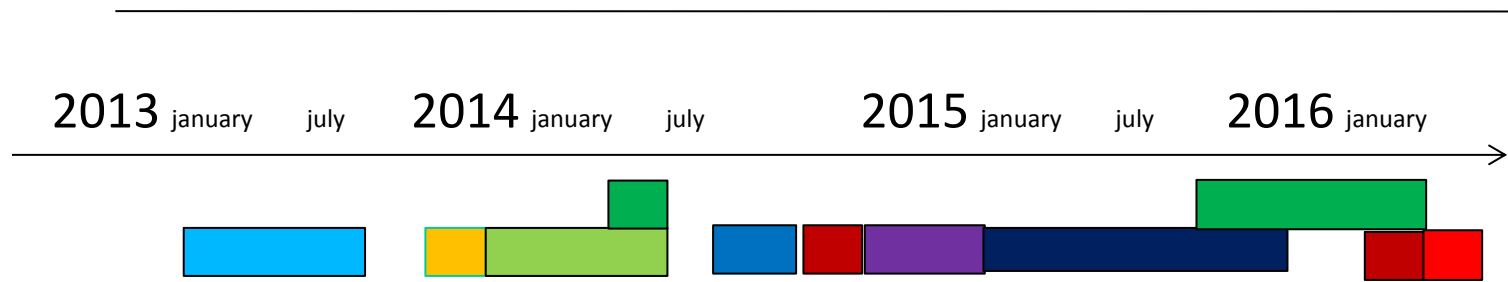
- **Etude d'incidence** par un groupement de bureau d'étude des mesures nouvelles sélectionnées (analyse coût- efficacité (ACE)) (octobre 2013 – mars 2014)
- **Mise en cohérence nationale** des mesures nouvelles (avril 2014)
- **Association des parties prenantes** au niveau national et dans les SRM (mai- juillet 2014)
- **Finalisation** des projets de programmes de mesures et du rapport environnemental (juillet 2014)
- Saisine de l'autorité environnementale pour **évaluation environnementale** des projets de programmes de mesures (septembre 2014)
- **Consultation des instances** (4 mois) **et du public** (6 mois) sur les projets de programmes de mesures **à compter du 19 décembre 2014**. Cette consultation est articulée avec la consultation sur les SDAGE et PdM DCE (DCE) et les PGRI (directive Inondations)

# Etapes en cours et à venir

---

- **Echanges avec les autres Etats Membres** pour **harmoniser** les programmes de mesures entre eux, **informer** les autres Etats Membres des programmes de mesures et de leurs incidences éventuelles, **discuter** des éventuelles propositions de recommandations à la Commission européenne
- **Approbation** par arrêté des autorités compétentes **des programmes de mesures** (fin 2015)
- **Notification, rapportage** et mise en œuvre des programmes de mesures à la Commission européenne (premier trimestre 2016)

# Calendrier récapitulatif



- Mesures existantes // mesures nouvelles / Existing measures //new measures
- Projets de mesures nouvelles / Project of new measures
- Evaluation des incidences / Impact assessment
- Elaboration PdM harmonisation / Global work on PoM
- Consultation des parties prenantes / Stakeholders consultation
- Projet de programmes de mesures / PoM draft
- Avis de l'autorité environnementale /Approval
- Consultations / Public and stakeholders consultation
- Décision politique, approbation, notification / Decision, approval, notification

---

## ***4. Réalisation de l'étude d'incidences***



# Cadre d'analyse de l'étude d'incidence

---

Schématiquement, l'étude d'incidence évalue les mesures selon un cadre d'analyse simple basé sur **cinq critères** :

- la **faisabilité de mise en œuvre de la mesure** ;
- les **incidences sociales** ;
- les **incidences économiques** ;
- les **incidences environnementales** ;
- le caractère **coût-efficace** de la mesure.



# Les incidences économiques, sociales et environnementales

---

L'**incidence économique** est principalement analysée de manière **qualitative** en identifiant les **activités impactées** par la mesure, la **nature** et la **durée** des impacts.

Des **éléments quantifiés** sur des variations potentielles de chiffres d'affaires ou de la valeur ajoutée sont également présentés **lorsque cela a été possible** pour renforcer l'analyse.

Les **incidences sociales** des mesures sont appréhendées via **l'emploi, la santé** ainsi que **la distribution des impacts** pour un secteur donné ou une zone géographique donnée ; une attention particulière étant apportée aux populations et secteurs les plus fragiles.

Concernant les **incidences environnementales**, l'étude évalue les **incidences sur le milieu marin, relatives aux descripteurs du bon état écologique**.

NB : les incidences hors milieu marin sont évaluées dans le cadre de l'évaluation environnementale des Plans d'actions, menée en parallèle de l'étude d'incidence par un organisme technique de l'Etat.

# L'analyse coût-efficacité

Elle permet de **comparer les mesures entre elles** au regard de deux critères uniquement : les **coûts directs** de mise en œuvre de la mesure **comparés à l'efficacité environnementale** de la mesure au regard de l'atteinte des objectifs de la DCSMM.

L'efficacité environnementale d'une mesure a été analysée par l'**impact potentiel de la mesure sur l'état du milieu marin par rapport à l'objectif environnemental proposé pour le descripteur ciblé.**

Evaluation de l'efficacité des mesures sur une **projection à l'horizon 2021, selon trois catégories** :

- Les mesures conduisant à une **efficacité forte**
- Les mesures conduisant à une **efficacité potentiellement forte** (au regard d'incertitudes jugées limitées)
- Les mesures conduisant à une **efficacité non quantifiable ou incertaine**

→ **Trois niveaux d'évaluation de l'efficacité environnementale** (forte, potentiellement forte, incertaine),

**et trois tranches de coûts de mise en œuvre** (faibles - inférieurs à 100 000 € ; moyens – entre 100 000 et 300 000 € ; et élevés - supérieurs à 300 000 €).

---

## *5. Exemples de mesures nouvelles*





# Quelques chiffres, et mesures nouvelles

---

En Méditerranée, **63 mesures nouvelles proposées** :

- 32 relatives à l'état écologique (intégrité des fonds, biodiversité, ressources halieutiques, mammifères et oiseaux marins, ...)
- 12 liées aux pressions et impacts (contaminants, déchets, polluants rejetés par les navires, espèces non-indigènes)
- 19 mesures transversales (recherche et développement, instruments réglementaires encadrant les activités maritimes, sensibilisation et éducation, ...)

**Nature des mesures** : études, gouvernance, réglementaire, sensibilisation/éducation, travaux...



# Quelques chiffres, et mesures nouvelles

---

## Exemples de mesures nouvelles pour le descripteur « déchets marins » (8 mesures) :

*Deal with the specific issue of marine waste and litter in departmental prevention and management plans for non-hazardous waste*

*Define and develop a best practise guide for managing and disposing of waste in the coastal zone*

*Identify and promote the most relevant systems to limit the transfer of macrowaste during dredge spoil dumping operations*

*Install recovery and recycling systems which are adapted to the type of litter collected by fishermen and promote their use to general value*

*Examine the options for collecting and processing or recycling fishing gear and equipment at the end of its serviceable life and waste from shellfish farming*



---

**Merci à tous pour votre attention**





# STATE OF PLAY OF MSFD PROGRAMME OF MEASURES IN SPAIN

**Laura Díaz**  
**Division for the Protection of the Sea.**  
**Ministry of Agriculture, Food and Environment**  
**of Spain**

UNEP/MAP and  
CAM 3b, Athens  
11-13 May 2015



GOBIERNO  
DE ESPAÑA

MINISTERIO  
DE AGRICULTURA, ALIMENTACIÓN  
Y MEDIO AMBIENTE



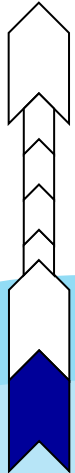
# Overview



- I. MSFD: overall approach**
- II. Drafting process of PoM**
  - 1. To identify existing measures**
    - 1.1. Budget programmes research
    - 1.2. Request on information
    - 1.3. Compilation of WFD relevant measures
    - 1.4. Measures database
  - 2. Gap analysis and proposal of new measures**
  - 3. CBA/CEA analysis (new measures)**
  - 4. Proposal of exceptions**
- III. Future steps of the drafting process**

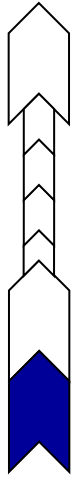
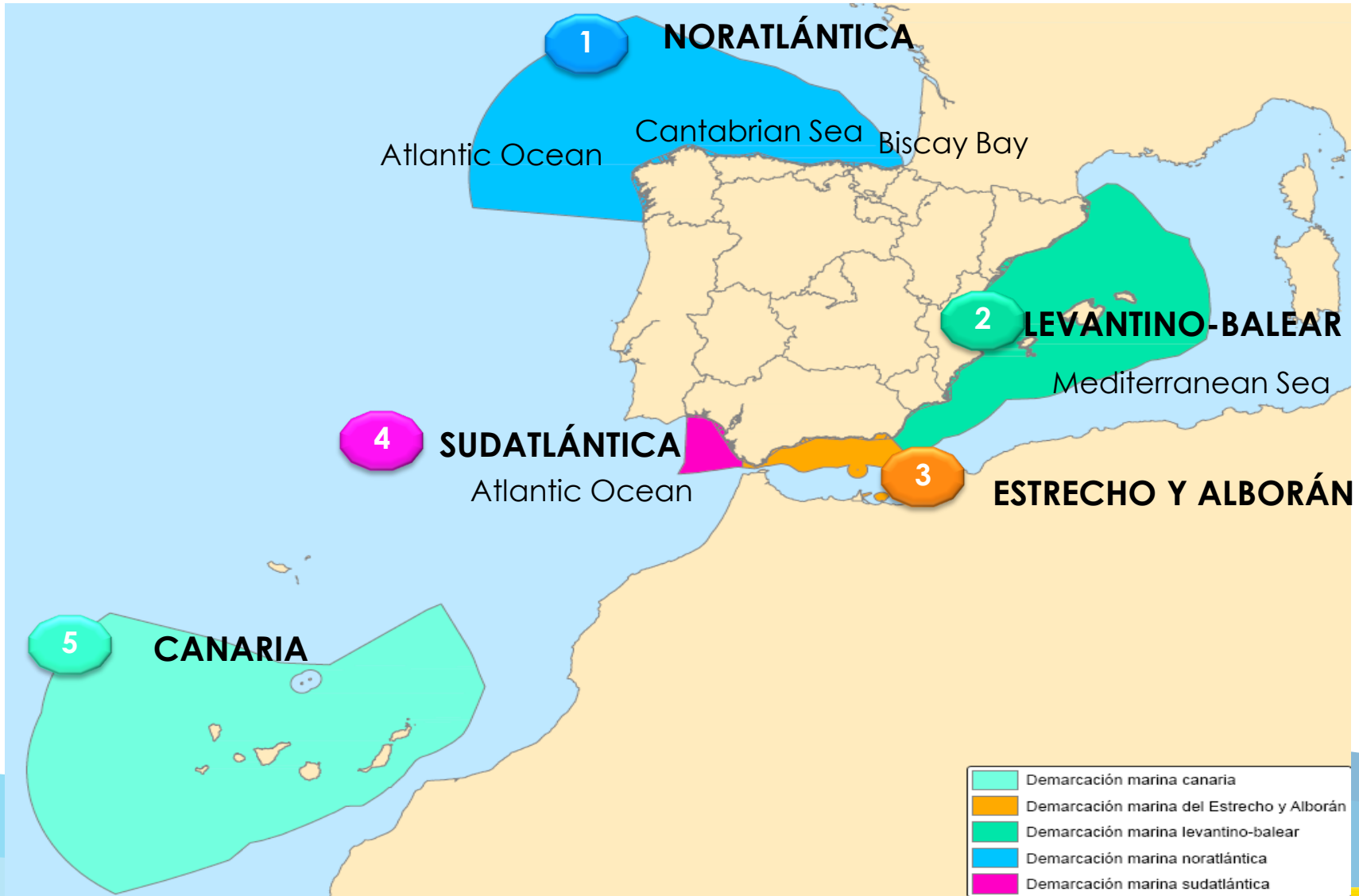


# I. MSFD: Overall Approach





# 5 Marine Subdivisions in Spain

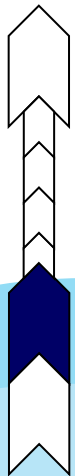




# II. Drafting process of PoM



1. A big effort in research work has been done **to identify existing measures: Done Sept 14-Jan15**
  - 1.1. Compilation, updating and analysis of the Government and the Autonomous Regions **budgets programmes** which are directly related with the marine protection/conservation: **Done**
  - 1.2 **Request on information** to competent authorities in Ministries and Autonomous Regions  
A **questionnaire** has been sent: **Done**
    - 1<sup>st</sup> call: **Feb15**
    - 2<sup>nd</sup> call: **April 15**
  - 1.3 Phase II: WFD and other measures **Ongoing Jan-Jun15**







# II. Drafting process of PoM



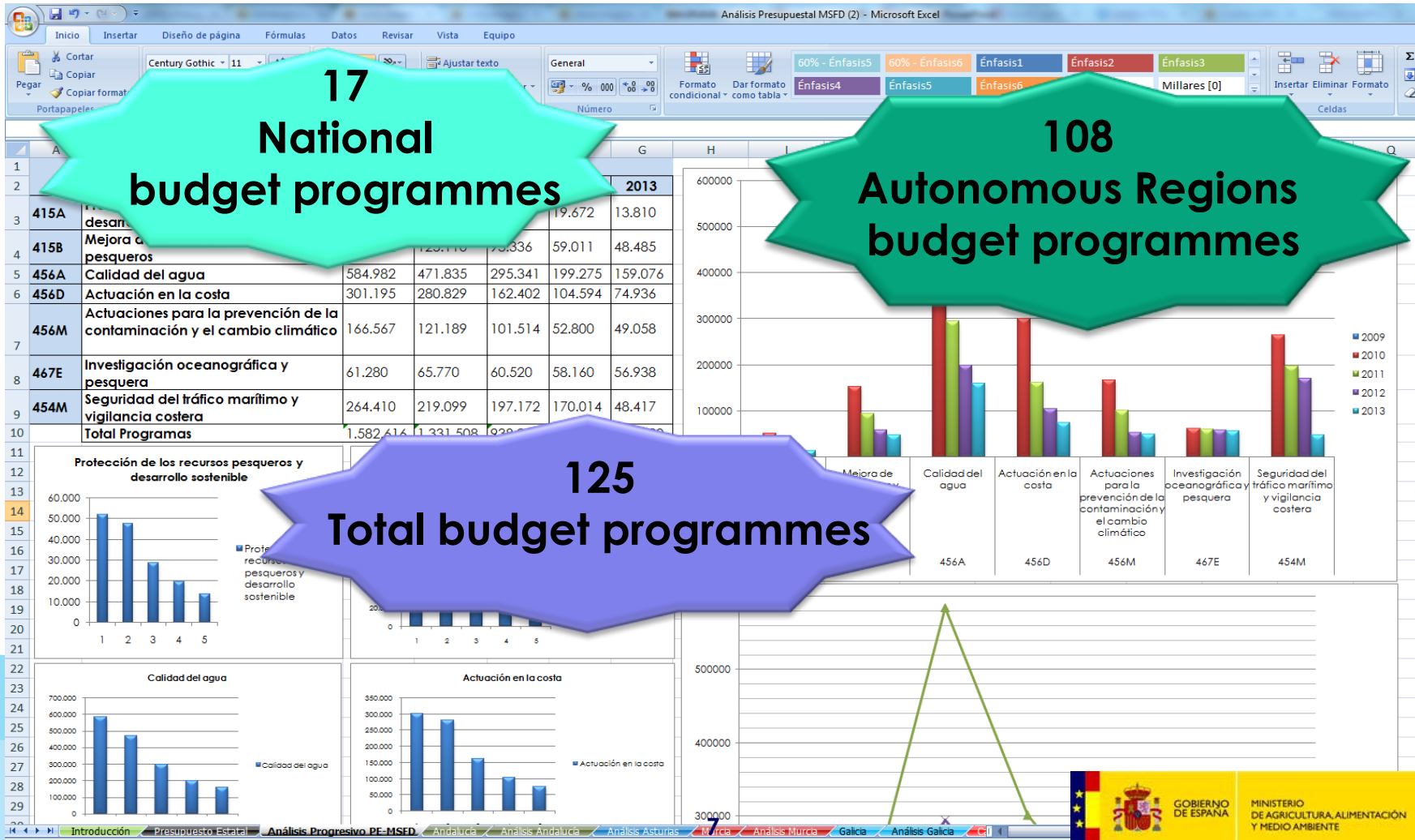
2. **Gap analysis** and proposal of **new measures** based on its results: **ongoing May-Sep15**
  3. **CBA/CEA analysis** (new measures): **pending May-Sep15**
  4. Analysis of the proposed **exceptions**: **pending May-Sep15**
- To write the draft technical document of PoM: **ongoing May-Sep15**



# 1. TO IDENTIFY EXISTING MEASURES



## 1.1. COMPILATION, UPDATING AND ANALYSIS OF MARINE BUDGET PROGRAMMES





# National level

**10 Ministries**

**19 General Directorate/  
other Units**

**identified**

**17 National  
Budget  
Programmes**



The Ministry of Agriculture, Food and Environment



The Ministry of Economy and Competitive



The Ministry of Public Works and Transport



The Ministry of Health, Social Services and Equality



The Ministry of Internal Affairs



The Ministry of Foreign Affairs



The Ministry of Defense



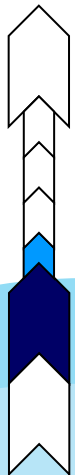
The Ministry of Industry



The Ministry of Finance and Public Administration

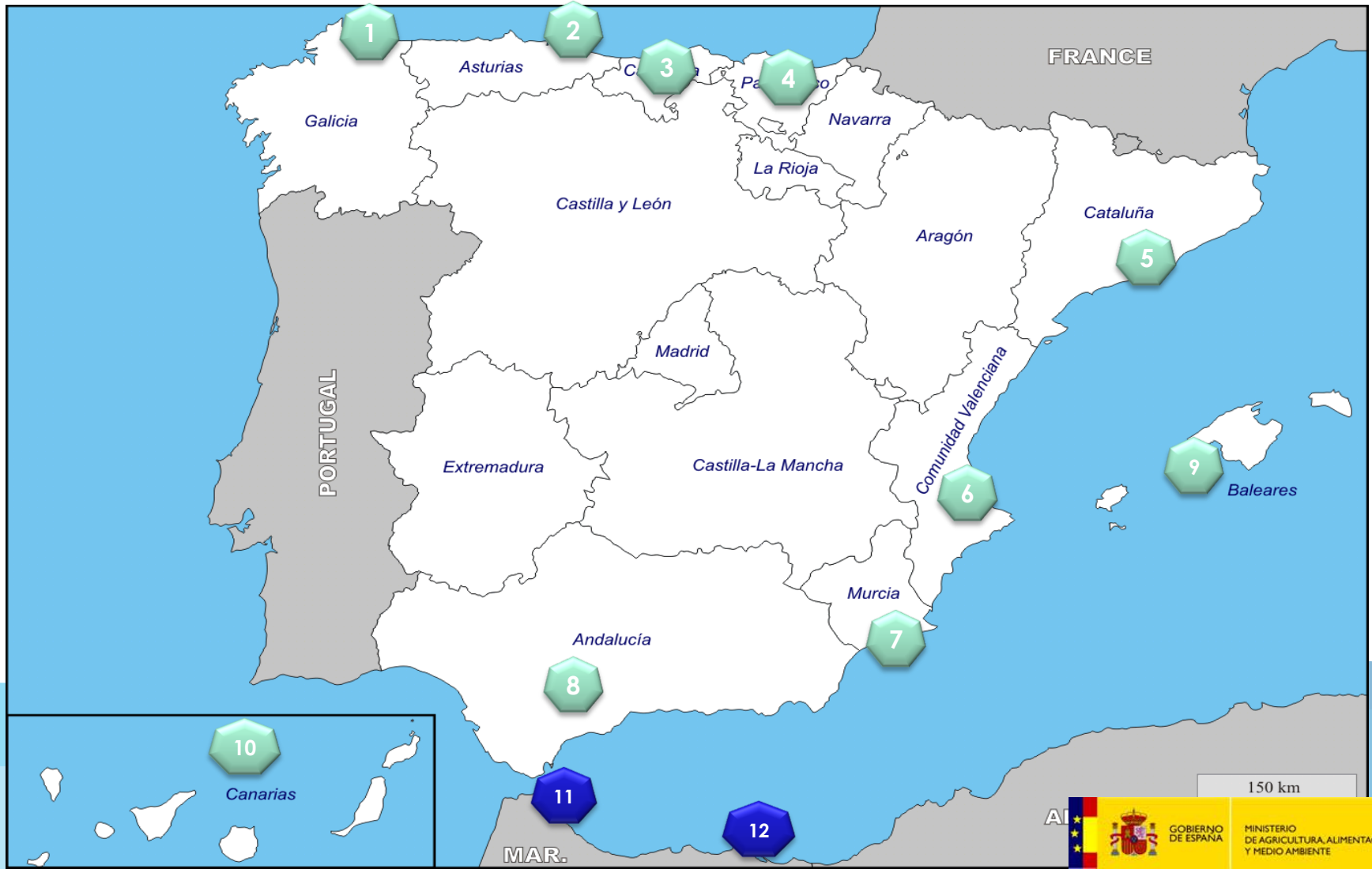


The Ministry of Education, Culture and Sports





# Regional level: 10 coastal Autonomous Regions, 2 Autonomous Cities

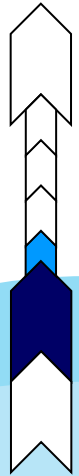
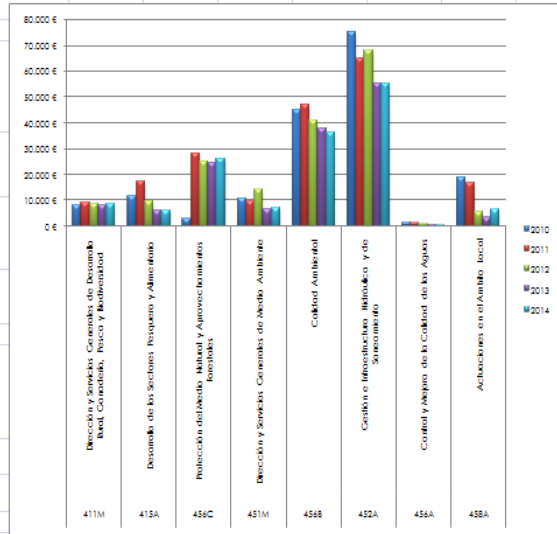




# BUDGET PROGRAMMES DATABASE: National and regional level



	A	B	Cifras en Miles de Euros					H	I	J	K	L	M	N	O	P	Q	R	S	T	
1	Programas		2010	2011	2012	2013	2014		Bar Chart Data												
3	411M	Dirección y Servicios Generales de Desarrollo Rural, Ganadería, Pesca y Biodiversidad	8.015	9.279	8.430	8.335	8.559	Consejería de Ganadería, Pesca y Biodiversidad	80.000	70.000	60.000	50.000	40.000	30.000	20.000	10.000	0				
4	415A	Desarrollo de los Sectores Pesquero y Alimentario	11.487	17.249	9.533	5.951	6.199		30.000	20.000	10.000	0									
5	456C	Protección del Medio Natural y Aprovechamientos Forestales	2.958	28.245	24.766	24.430	26.055		10.000	0											
6	451M	Dirección y Servicios Generales de Medio Ambiente	10.805	9.726	14.279	6.510	7.193	Consejería de Medio Ambiente, Ordenación del Territorio y Urbanismo	40.000	30.000	20.000	10.000	0								
7	456B	Calidad Ambiental	44.882	47.022	40.974	37.529	35.949		70.000	60.000	50.000	40.000	30.000	20.000	10.000	0					
8	452A	Gestión e Infraestructura Hidráulica y de Saneamiento	74.860	64.706	67.807	55.269	55.066		10.000	0											
9	456A	Control y Mejora de la Calidad de las Aguas	1.399	1.276	824	612	312		0												
10	458A	Actuaciones en el Ambito Local	18.993	16.560	5.519	3.287	6.328														
11	<b>Total Programas</b>		<b>173.399</b>	<b>194.062</b>	<b>172.133</b>	<b>141.922</b>	<b>145.661</b>														



**Dirección y Servicios Generales de Desarrollo Rural, Ganadería, Pesca y Biodiversidad**

**Desarrollo de los Sectores Pesquero y Alimentario**

**Protección del Medio Natural y Aprovechamientos Forestales**

**Dirección y Servicios Generales de Medio Ambiente**

**Line Chart: Quality of Water and Local Actions**

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[Análisis Asturias](#)
[Murcia](#)
[Análisis Murcia](#)
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[C. Valenciana](#)
[Islas Canarias](#)

GOBIERNO DE ESPAÑA  
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE



# INVENTORY OF EXISTING MEASURES

**8 GROUPS**

**BUDGET PROGRAMMES**

Environment and Biodiversity Management

Water Quality, Control and Protection of Water Resources

Fishery Business Structures

Environmental Protection and Continuous Improvements

Fishery Resources Protection and Sustainable Development

Climate Change Actions and Environmental Quality

Coastal Control and Maritime Traffic

Ocean and Fisheries Research





# ANALYSIS DESCRIPTORS - GROUPS OF PROGRAMMES - MSFD KTM

1. Biological diversity
2. Non indigenous species
3. Commercially exploited species
4. Marine food webs
5. Eutrophication
6. Sea-floor integrity
7. Hydrographical conditions
8. Contaminants
9. Health issues
10. Marine litter
11. Marine energy

## GROUPS OF BUDGET PROGRAMMES

7. Environmental Protection and

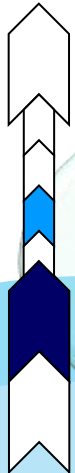
## KTM's

## 11 DESCRIPTORS ANALYSIS

26. Measures to reduce physical loss of seabed habitats in marine waters.
27. Measures to reduce physical damage in marine waters.
28. Measures to reduce inputs of energy, including underwater noise, to the marine environment.
29. Measures to reduce litter in the marine environment.
30. Measures to reduce interferences with hydrological processes in the marine environment.
31. Measures to reduce contamination by hazardous substances and the systematic and/or intentional release of substances in the marine environment from sea-based or air-based sources.
32. Measures to reduce sea-based accidental pollution.
33. Measures to reduce nutrient and organic matter inputs to the marine environment from sea-based or air-based sources.
34. Measures to reduce the introduction and spread of non-indigenous species in the marine environment and for
35. Measures to reduce biological disturbances in the marine environment from the extraction of species, including incidental non-target catches.
36. Measures to reduce other types of biological disturbance, including death, injury, disturbance, translocation of native marine species, the introduction of microbial pathogens and the introduction of genetically-modified individuals of marine species.
- Measures to restore and conserve marine ecosystems, including habitats and species.
- Measures related to Spatial Protection Measures for the marine environment.
- Measures measures.

Descriptors

MSFD KTM





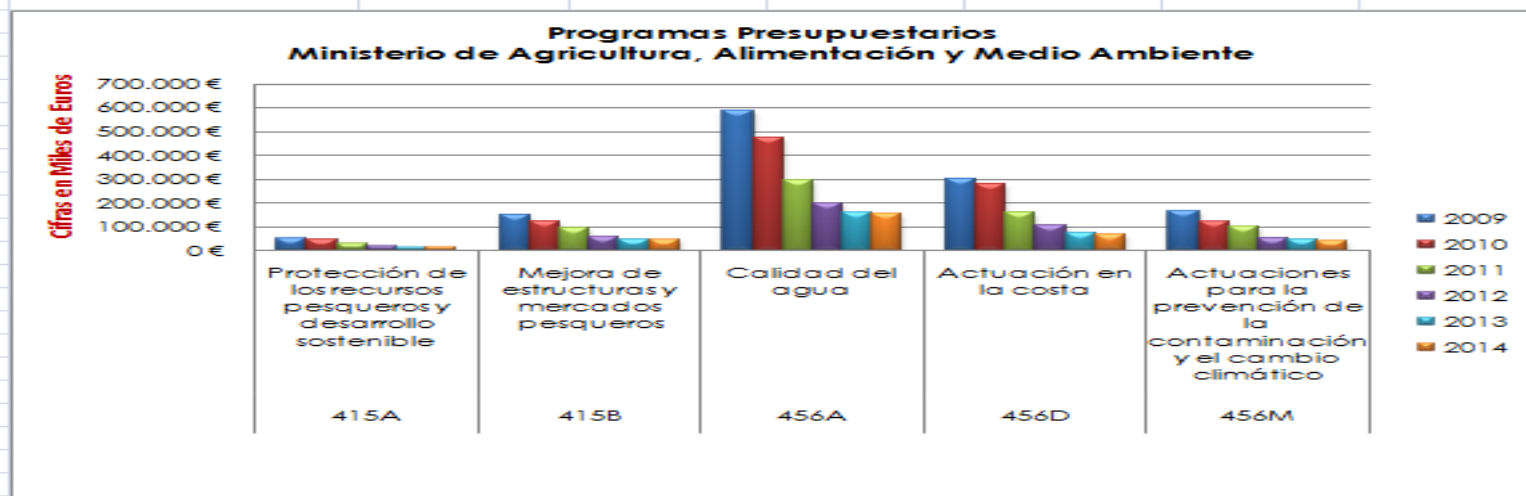
# 1. TO IDENTIFY EXISTING MEASURES



## 1.2 REQUEST ON INFORMATION

Programas		Cifras en Miles de Euros					
		2009	2010	2011	2012	2013	2014
4	<b>415A</b> Protección de los recursos pesqueros y	52.100 I	47.676 I	28.667 I	19.672 I	13.810 I	14.905 I
5	<b>415B</b> Mejora de estructuras y mercados pesqueros	152.082 I	125.110 I	93.336 I	59.011 I	48.485 I	46.294 I
6	<b>456A</b> Calidad del agua	584.982 I	471.835 I	295.341 I	199.275 I	159.076 I	156.140 I
7	<b>456D</b> Actuación en la costa	301.195 I	280.829 I	162.402 I	104.594 I	74.936 I	66.408 I
8	<b>456M</b> Actuaciones para la prevención de la contaminación y el cambio climático	166.567 I	121.189 I	101.514 I	52.800 I	49.058 I	42.412 I
9	<b>Total Programas</b>	<b>1.256.926 I</b>	<b>1.046.639 I</b>	<b>681.259 I</b>	<b>435.352 I</b>	<b>345.365 I</b>	<b>326.158 I</b>

Ministerio de Agricultura, Alimentación y Medio Ambiente







# To assign measures to KTM's



GROUPS OF BUDGET PROGRAMMES

KTM's

11 DESCRIPTORS ANALYSIS

		Programa(s) presupuestario(s) que recoge(n) ésta acción <b>(467E)</b>	Presupuesto destinado
1.4	¿Qué medidas concretas dirigidas a la protección del medio marino, en el marco del siguiente programa presupuestario, ha puesto en marcha o prevé poner el Ministerio de Economía y Competitividad?		
19	<b>a. Medidas para reducir la pérdida física de los hábitats bentónicos en aguas marinas (sin considerar aquellas relacionadas con la DMA)</b>		
	<b>... (A Cumplimentar)</b> Ejemplo: regulación de fondeos, regulación de la pesca de arrastre (y otras modalidades de pesca), regulación de extracción de especies, etc		
21	<b>b. Medidas para reducir el daño físico en aguas marinas (sin considerar aquellas relacionadas con la DMA)</b>		
	<b>... (A Cumplimentar)</b> Actuaciones dirigidas a reducir el daño físico en aguas marinas, como regulación de actividades que puedan producir modificación de perfil de fondo y/o enterramiento, modificaciones de la sedimentación; ejemplo: vertidos de material de dragados portuarios, bateas y el cultivo de mejillones, actuaciones dirigidas a la regulación de arrecifes artificiales		
	<b>c. Medidas para reducir entradas de energía, incluyendo ruido submarino, al medio ambiente marino</b>		
	<b>... (A Cumplimentar)</b> Listado de Estrategias, Planes, Programas, y normativa con actuaciones dirigidas a reducir entradas de energía, incluyendo ruido submarino; ejemplo: cables y tuberías, vertidos de material portuario dragado, navegación, instalaciones portuarias, etc		
	<b>d. Medidas para reducir basura en el medio ambiente marino</b>		
	<b>... (A Cumplimentar)</b> Ejemplo: actuaciones dirigidas a reducir basura en el medio marino, como planes de gestión de residuos, campañas de limpieza en playas, programas de "fishing-for-litter" (recogida de basura por pescadores), etc		
29			
30			
31	<b>e. Medidas para reducir interferencias con procesos hidrológicos en el medio ambiente marino (sin considerar aquellas relacionadas con la DMA)</b>		
	<b>... (A Cumplimentar)</b> Ejemplo: regulación de actividades que produzcan modificaciones significativas del régimen térmico, modificaciones significativas del régimen de salinidad, alteraciones de las condiciones hidrográficas, etc		
32			
33			
34	<b>f. Medidas para reducir la contaminación por sustancias peligrosas (sustancias sintéticas, no-sintéticas, radionucleidos) la liberación sistemática y / o intencional de sustancias en el medio marino desde el mar o del aire</b>		
	<b>... (A Cumplimentar)</b> Ejemplo: programas para la reducción de la contaminación atmosférica, regulación/control de los vertidos de la actividad de acuicultura, etc		
35			
36			
37	<b>g. Medidas para reducir la contaminación accidental en el mar</b>		
	<b>... (A Cumplimentar)</b> Listado de Estrategias, Planes y Programas, y normativa con actuaciones dirigidas a reducir la contaminación accidental en el mar, a actividades de navegación recreativa, planes de contingencia de emergencias, planes de navegación de		

KTM's





**1<sup>st</sup> Call:**  
**Questionnaire PoM**  
**Ministries and Autonomous Regions**

**(65 administrative units:  
25 National level +  
40 Regional level)**

**1<sup>st</sup> call Feedback:**  
**Total: 35 Units responded**  
**13 National level +  
22 Regional level)**







# 1. TO IDENTIFY EXISTING MEASURES

## 1.2. REQUEST ON INFORMATION

### 2<sup>st</sup> Call:

Questionnaire PoM Ministries and Autonomous Regions:

-  No previous response:  
(47 administrative units:  
7 National level + 40 Regional level)
-  Incomplete previous response: 7 adm. Units
-  Deficient previous response: 3 adm. Units
-  Complete previous response: **pendient. May**

**2015**



**2<sup>nd</sup> call Feedback:**  
**Total: 9 Units responded**  
**5 National level +**  
**4 Regional level)**

2<sup>nd</sup> call is still opened

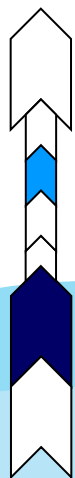




# 1.3. COMPILATION OF WFD RELEVANT MEASURES (KTM FROM 1-25)

Nº	WFD KTM description	Indicative relevance to MSFD
1	Construction or upgrades of wastewater treatment plants	Relevant for the reduction of nutrient loads & solid particles (D5, D10)
2	Reduce nutrient pollution from agriculture	Relevant for the reduction of nutrient loads (D5)
3	Reduce pesticides pollution from agriculture	Relevant for the reduction of contaminants loads (D8, D9)
4	Remediation of contaminated sites (historical pollution including sediments, groundwater, soil)	Relevant for the reduction of contaminants loads (D8, D9)
5	Improving longitudinal continuity (e.g. establishing fish passes, demolishing old dams)	Relevant in relation to diadromous fish (D1) and sediments (D7)
6	Improving hydromorphological conditions of water bodies other than longitudinal continuity (e.g. river restoration, improvement of riparian areas, removal of hard embankments, reconnecting rivers to floodplains, improvement of hydromorphological condition of transitional <b>and coastal</b> waters, etc.)	Relevant (D7)
7	Improvements in flow regime and/or establishment of ecological flows	Relevant (D7)
8	Water efficiency technical measures for irrigation, industry, energy and households	Unlikely
9	Water pricing policy measures for the implementation of the recovery of cost of water services from households	Unlikely
10	Water pricing policy measures for the implementation of the recovery of cost of water services from industry	Unlikely
11	Water pricing policy measures for the implementation of the recovery of cost of water services from agriculture	Unlikely
12	Advisory services for agriculture	Relevant for nutrient and pesticide reduction (D5, D8, D9)
13	Drinking water protection measures (e.g. establishment of safeguard zones, buffer zones etc.)	Relevant for seawater desalination (D7)

Nº	WFD KTM description	Indicative relevance to MSFD
14	Research, improvement of knowledge base reducing uncertainty	Relevant, could be applied to all descriptors
15	Measures for the phasing-out of emissions, discharges and losses of priority hazardous substances or for the reduction of emissions, discharges and losses of priority substances	Relevant for the reduction of contaminant loads (D8, D9)
16	Upgrades or improvements of industrial wastewater treatment plants (including farms)	Relevant for the reduction of nutrients, solid particles and contaminant loads (D5, D8, D9, D10)
17	Measures to reduce sediment from soil erosion and surface run-off	Possibly relevant for the reduction of nutrients & sediments (D5, D7)
18	Measures to prevent or control the adverse impacts of invasive alien species and introduced diseases	Relevant (D2)
19	Measures to prevent or control the adverse impacts of recreation including angling	Relevant (D2, D3, D10, D11)
20	Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants	Relevant (D1, D3, D4, D6)
21	Measures to prevent or control the input of pollution from urban areas, transport and built infrastructure	Relevant for the reduction of pollution in general (D5, D8, D9, D10, D11)
22	Measures to prevent or control the input of pollution from forestry	Possibly relevant for the reduction of nutrient and contaminant loads (D5, D8, D9)
23	Natural water retention measures	Relevant for positive effects on nutrients and sediment transport (D5, D7)
24	Adaptation to climate change	Relevant, in particular when related to the coastal zone (D1, D4, D6, D7)
25	Measures to counteract acidification	







# Measures Database: objectives

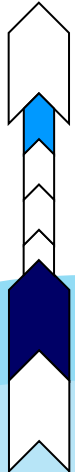
## a-. Compilation of measures



Dynamic tool: registration of existing and new measures, and its general and specific information (5 Marine Subdivisions)

T_Medidas
Id_Medida
Id_Tipo_Medidas_M
Id_Ambito_Geografico_M
Id_Categoria_Anexo_6_M
Id_Categoria_Medidas_M
Id_Factibilidad_Tecnica_M
Id_Eficacia_M
Id_Coord_Regional_Nivel_Requerido
Id_Coord_Nacional_UE_Nivel_Requerido
Id_Vinculo_Legislacion_EU
Id_Vinculo_Otra_Legislacion
Id_N_Coste_Eficacia_M
Id_N_Coste_Beneficio_M
Id_Autoridad_Responsable_M
Id_Tipo_Respuesta_Cuestionario_M
Cod_Medida
Titulo_Medida
Descripcion_Medida
Efecto_Previsto
Favorece_Red_AMP
N_Metodologia_Seleccion
Coord_Regional_Descripcion
Coord_Nacional_UE_Descripcion
N_Efectos_Transfronterizos
Es_Medida_Nueva

T_Medidas_Objetivos_Demarcacion
Id_Medida_Objetivo_Demarcacion
Id_Medida_MOD
Id_Fuente_Financiacion_MOD
Id_Fecha_Implementacion_MOD
Id_Demarcacion_MOD
Cod_Medida_Demarcacion
Justificacion_No_Implementation
Coste
Unidades_Coste
Coste_Descripcion
Publicacion_Referencia
Link_Info
Observaciones
Organo_Ejecutor
N_Implementacion_Metodo







# Measures Database: objectives

## b. Analysis and assessment of the information regarding the measures

medidas

 **MEDIDA**  GOBIERNO DE ESPAÑA MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

Código Medida **E000300**  Existente  Nueva Respuesta cuestionario

Título

**Datos Generales** **Datos Técnicos**

Descripción

Tipo

Categoría

Tipología (Anexo VI. D. marco sobre la Estrategia Marina)

Ámbito geográfico


Autoridad responsable

Descriptores

Medida por Demarcación

Registro: 14 1 de 1 Sin filtrar Buscar

medidas

 **MEDIDA**  GOBIERNO DE ESPAÑA MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

Código Medida **E000300**  Existente  Nueva Respuesta cuestionario

Título

**Datos Generales** **Datos Técnicos**

Eficacia

Factibilidad Técnica

Vínculo Legislación UE

Vínculo Otra Legislación

Coordinación Regional

Nivel requerido de coordinación regional

Coordinación Nacional/UE

Medida por Demarcación Cerrar

Registro: 14 1 de 1 Sin filtrar Buscar







# Measures Database: objectives



## C. Elaboration of reporting sheets, reports, ect

- Reporting process: information on measures, exceptions, ect to EC (Reportnet)
- Thematic reports
- Friendly interface

**Informe Consulta Pública**

GOBIERNO DE ESPAÑA MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

Demarcación

KTM  
34 - Medidas para reducir la introducción y dispersión de especies alóctonas en el medio ambiente marino y para su control

Código medida	Título	Nueva/Existente	Tipo medida	Categoría medida	Ámbito geográfico	Demarcación	Fecha implement.	Fuente financiación	Publicación referencia
800001-ESAL	Convenio de Barcelona - Decisión 16.191/2 "Enmiendas a las listas de los anexos II y III del Protocolo sobre Zonas Especialmente Protegidas y la Diversidad Biológica en el Mediterráneo"	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	ESAL - Demarcación Marina del Ebro y Albuñón	Ya implementada	Sin presupuesto asignado	
800001-LEBA	Convenio de Barcelona - Decisión 16.191/2 "Enmiendas a las listas de los anexos II y III del Protocolo sobre Zonas Especialmente Protegidas y la Diversidad Biológica en el Mediterráneo"	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	LEBA - Demarcación Marina Levantino-Balear	Ya implementada	Sin presupuesto asignado	
800002-CAN	Convenio de Berna - Decisión del Consejo de 3 de diciembre de 1981 referente a la celebración del Convenio relativo a la conservación de la vida silvestre y del medio natural de Europa (82/72/CEE)	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	CAN - Demarcación Marina Canaria	Ya implementada	Sin presupuesto asignado	
800002-ESAL	Convenio de Berna - Decisión del Consejo de 3 de diciembre de 1981 referente a la celebración del Convenio relativo a la conservación de la vida silvestre y del medio natural de Europa (82/72/CEE)	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	ESAL - Demarcación Marina del Ebro y Albuñón	Ya implementada	Sin presupuesto asignado	
800002-LEBA	Convenio de Berna - Decisión del Consejo de 3 de diciembre de 1981 referente a la celebración del Convenio relativo a la conservación de la vida silvestre y del medio natural de Europa (82/72/CEE)	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	LEBA - Demarcación Marina Levantino-Balear	Ya implementada	Sin presupuesto asignado	
800002-NOR	Convenio de Berna - Decisión del Consejo de 3 de diciembre de 1981 referente a la celebración del Convenio relativo a la conservación de la vida silvestre y del medio natural de Europa (82/72/CEE)	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	NOR - Demarcación Marina Noratlántica	Ya implementada	Sin presupuesto asignado	
800002-SUD	Convenio de Berna - Decisión del Consejo de 3 de diciembre de 1981 referente a la celebración del Convenio relativo a la conservación de la vida silvestre y del medio natural de Europa (82/72/CEE)	Existente	Legislativas	1.a - Medidas existentes adoptadas bajo otras políticas e implementadas	Internacional	SUD - Demarcación Marina Sudatlántica	Ya implementada	Sin presupuesto asignado	

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Informe

GOBIERNO DE ESPAÑA MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE

**Detalle por Demarcación**

Código Medida Demarcación  
E00002-NOR

Demarcación NOR - Demarcación Marina Noratlántica

**Implementación**

Fecha implementación Ya implementada

Justificación no implementación

**Órgano ejecutor**  
Estados miembros

**Método**

**Observaciones**

**Publicación(es) de referencia**

**Link**

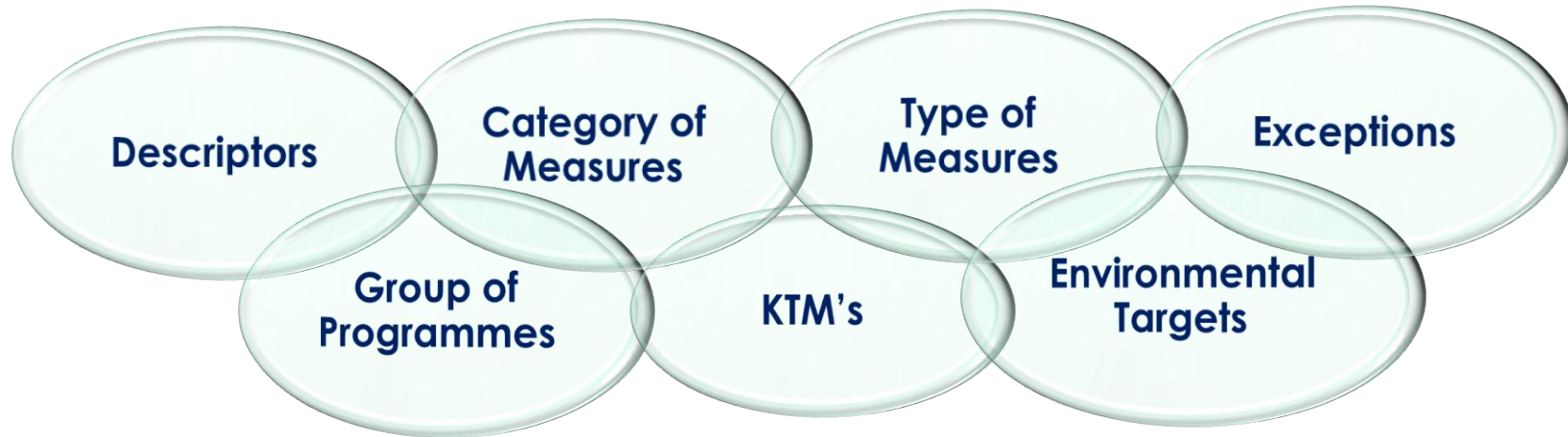
**Detalles económicos - Financiación de la Medida**

Página: 1 de 3 Filtrado

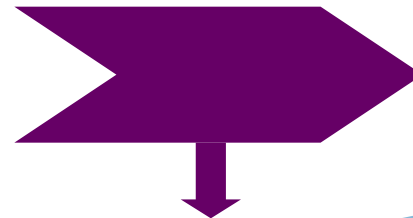


# III. Future steps of the drafting process

## 3. Gap Analysis: ongoing May-Sep15

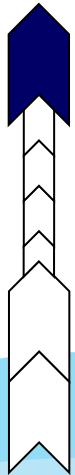


Initial assessment of marine environment



GES and environmental targets

Existing measures





### **3. Gap Analysis: ongoing May-Sep15**



- **D.1 Biodiversity workshop: 10-12 Jun 2015**
- **D.3 Fisheries workshop: Jun 2015**
- **WFD measures: River basin competent authorities workshop: Jun 2105**
- **D11 Marine litter workshop**
- **Cross-cutting issues workshop (if possible)**



**4. Proposal of new measures based on the gap analysis results: to bridge the gap. CBA/CEA pending May-Sep15**



**5. Determine and justify the exceptions: pending May-Sep15**

Strategic Environmental Assessment (ESA):

**1 Jun- Dic 2015, 2016**

Formal public consultation : **1 Oct-15 Nov 2015**

**5 Marine Strategies adopted**

**by Royal Decree: Dic 2015- first months 2016**



***THANK YOU VERY MUCH  
FOR YOUR KIND ATTENTION***

*contact: Laura Díaz*

*[ldiaz@magrama.es](mailto:ldiaz@magrama.es)*



# **Integrated management of human activities in Slovenian coastal and marine waters**

Dr. Monika Peterlin, Andreja Palatinus, Sabina Cepuš  
Institute for waters of the Republic of Slovenia (IWRS)

**Regional meeting on applying methodology for  
programmes of measures and economic analysis in the NAP update  
Athens, Greece, 11 – 13 May 2015**

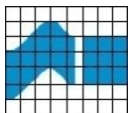




# CONTENT

- 1. Introduction**
- 2. Initial assessment**
- 3. Socioeconomic analysis**
- 4. Program of measures**
- 5. Conclusions**





## Integrated management / ecosystem approach



Foto: UNIC-SUB, L. Fonda

### Regional policies and processes

- UNEP MAP/Barcelona Convention and its Protocols (ECAP)
- CBD



Foto: OMEGA STUDIO, A. Primčič

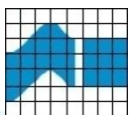
### EU/National policies

- **Marine Strategy Framework Directive (2008/56/EC)**
- **Water Framework Directive (2000/60/EC)**
- Directive on wastewater treatment
- Directives on emissions and quality standards for hazardous substances
- Habitats and birds directives
- Common fisheries directive
- Other...



Foto: OMEGA STUDIO, A. Primčič



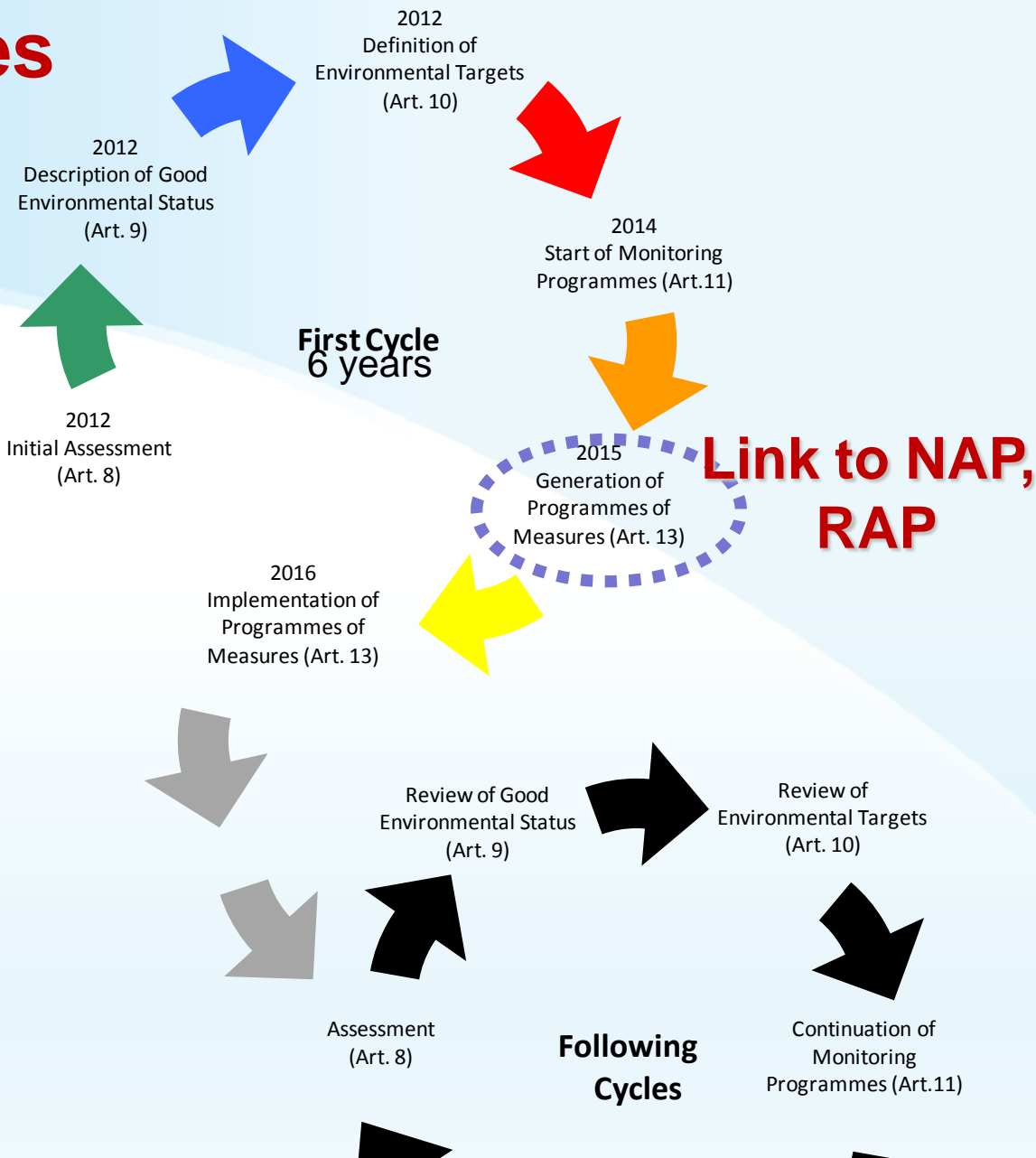


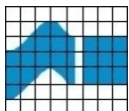
## Working cycles

**Overall objective**



**2020  
Good status of  
seas and oceans**





# Inital assessment (2012)

**Characteristics**  
(Tabel 1, Annex III)

**PHYSICAL AND CHEMICAL FEATURES** (bathymetry, temperature, salinity, transparency...  
**HABITATS** – predominant, special (protected)  
**BIOLOGICAL FEATURES** – biological communities associated to predominant habitats, species composition, biomass, population dynamics...., alien species (phytoplankton, macroalgae, seagrasses, Benthic invertebrates, zooplankton, fish (commercial), mammals, reptiles, sea birds

**Pressures and impacts**  
(Tabel 2, Annex III)

**PHYSICAL LOSS OF NATURAL AREAS IN COASTAL ZONE**  
**PHYSICAL DAMAGE OF SEAFLOOR**  
**UNDERWATER NOISE**  
**MARINE LITTER**  
**CONTAMINATION** – priority substances  
**CONTAMINATION** – specific pollutants  
**NUTRIENT AND ORGANIC MATTER ENRICHMENT**  
**BIOLOGICAL DISTURBANCE**

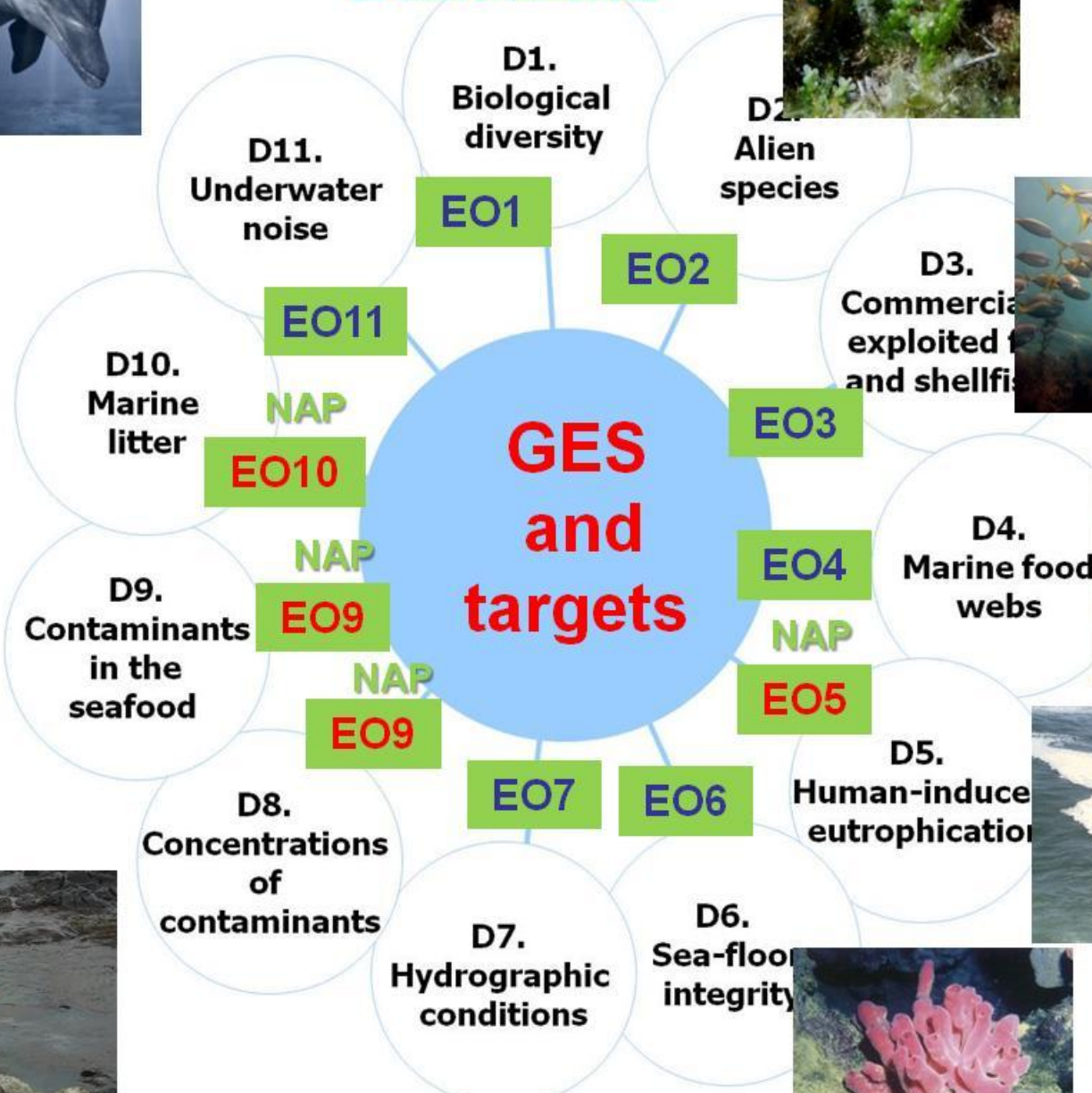
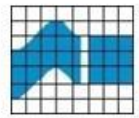
**Socio-economic assessment, including relevance of activities for the society, costs of deagrdation**

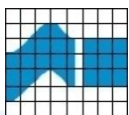
**Link to previous work:**  
**WFD experience and indicators**  
**Chemical status**  
**LBS assessment**

**Link to 11 DESCRIPTORS**

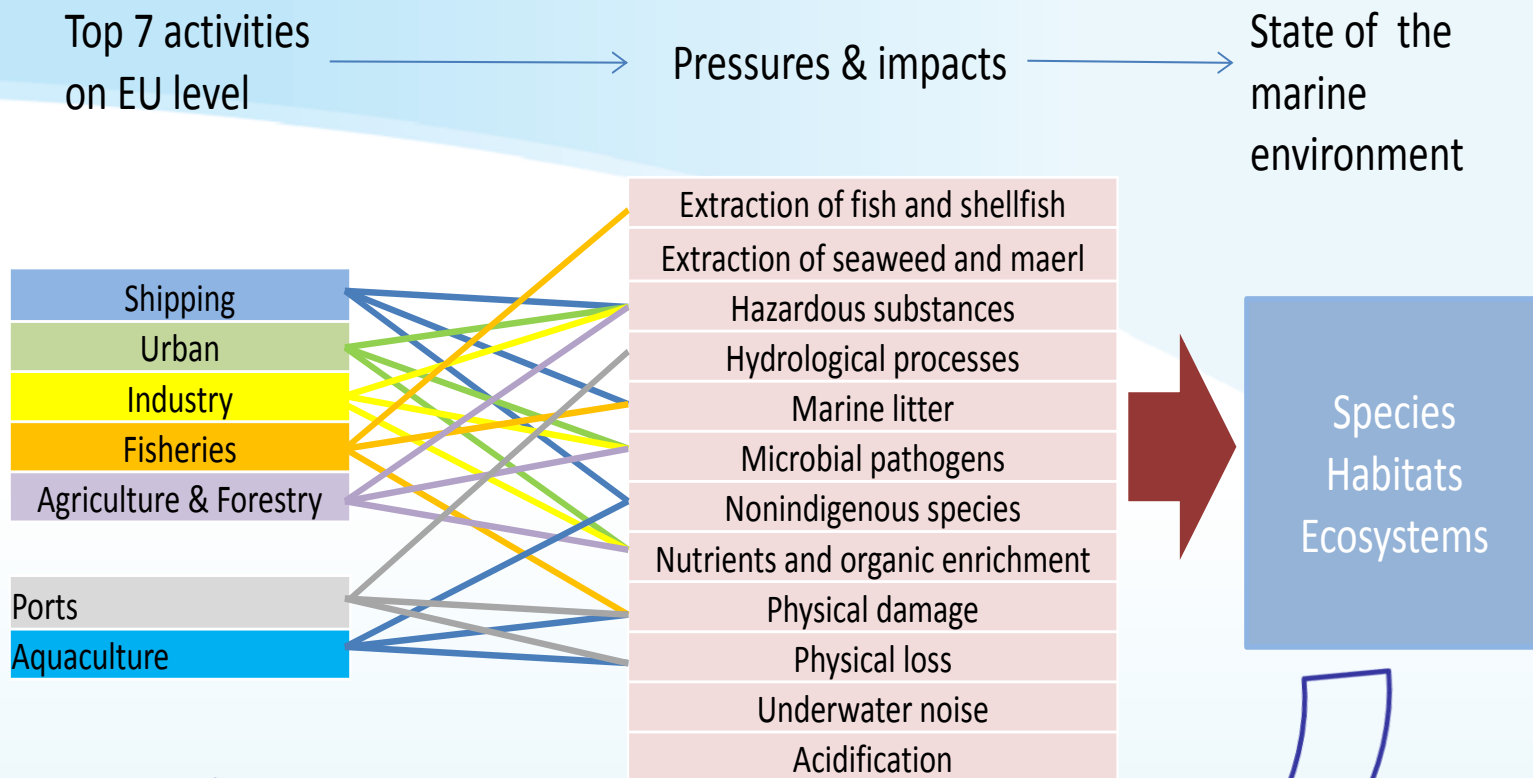
**=**

**11 ECAP EO**





# MSFD implementation process in practice - challenges

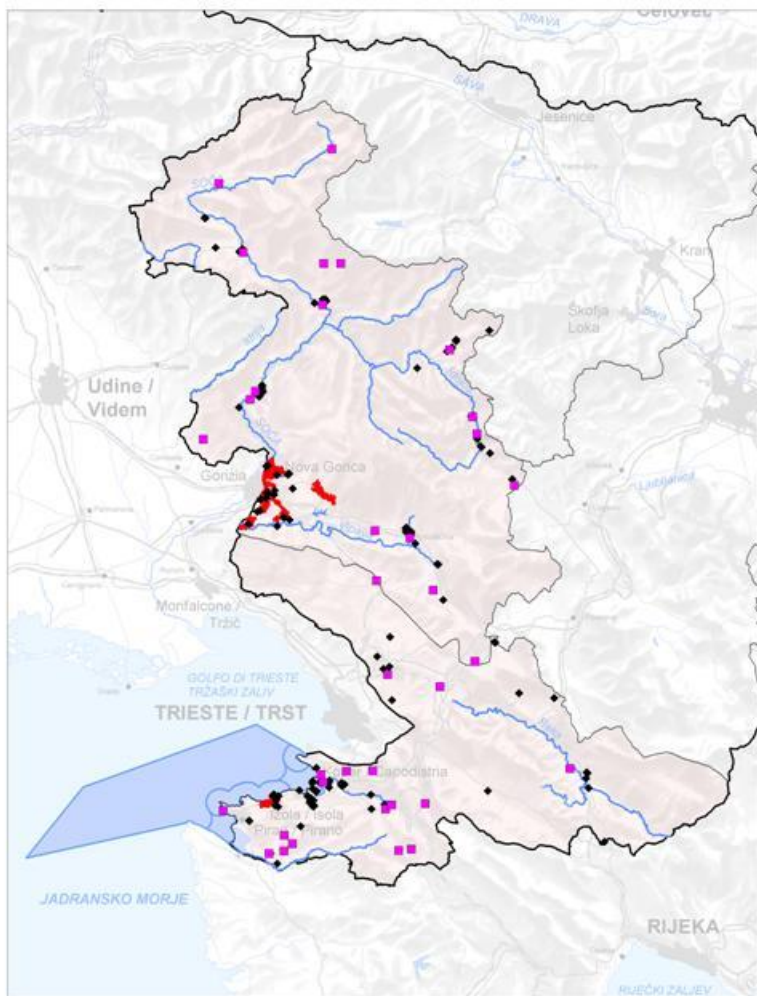


## Work in progress:

- **Quantification of links**
- **Limit values**
- **Regional coherence**



## POINT SOURCES IN TRIBUTARY RB (WWT and industrial effluent)

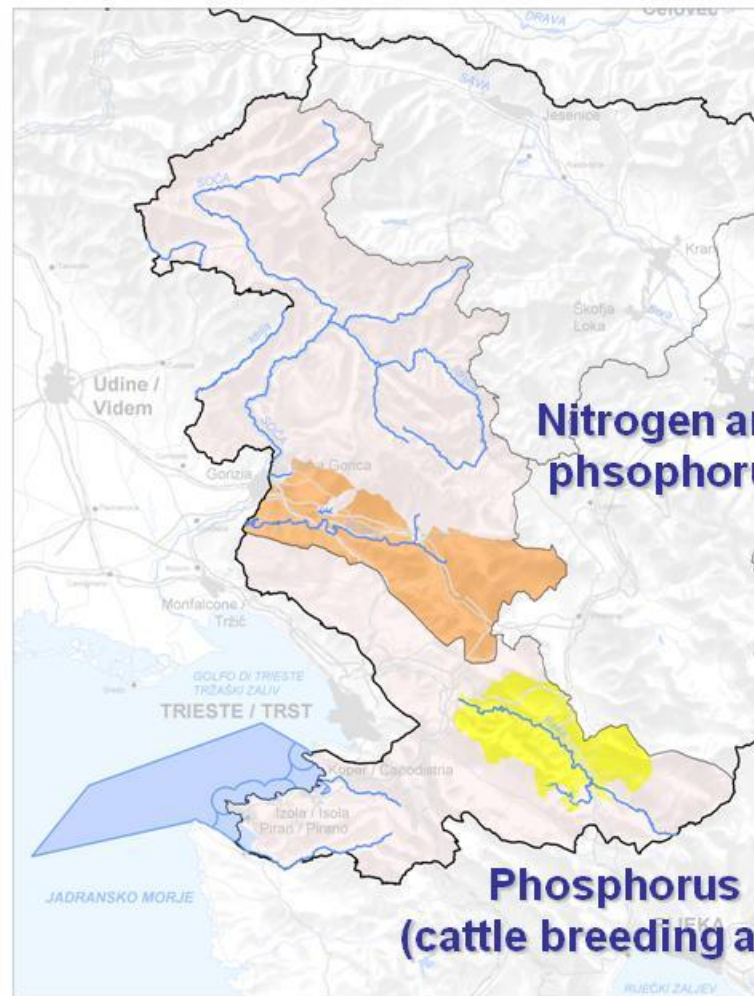


Point source pollution

- industrial effluent
- waste water effluent
- agglomeration >2000 PE

0 5 10 20 km

## DIFFUSE SOURCES IN TRIBUTARY RB



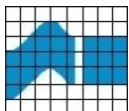
Difuse pollution sources (agriculture)

- phosphorus emission
- phosphorus and nitrogen emissions

0 5 10 20 km

Nitrogen and phosphorus

Phosphorus  
(cattle breeding area)



# Contaminants – priority substances

WFD, NAP4, BarC, ECAP



**Emissions from industry**

10 years data series from national emission monitoring  
No. of industrial plant that produce waste waters with PS and PHS is ↓



**Pesticides from agriculture**

Analysis on pesticides sold in the area. Includes data.  
Correlation with the concentrations of pesticides in the running waters.



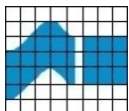
**Substances in antifouling paints**

(?) In the stage of investigative monitoring



**Storm water runoff**

Inventory of outflows location of storm water runoffs



# Contamination

with specific synthetic and non-synthetic pollutants

WFD, ECAP ?

Inputs:



**Emissions from industry**



**Incidental spills**



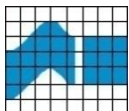
**Storm water runoff**



**Illegal dump sites**



**Pesticides from agriculture**



# Nutrient and organic matter enrichment

WFD, NAP 2004, BarC, ECAP OE5



**Waste water  
treatment  
plants**



**Dispersed  
settlements**



**Mariculture**



**Agriculture**



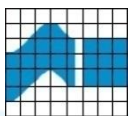
**Emissions  
from industry**



**Load from  
major rivers  
in N Adriatic**







# **Socio-economic analysis for Initial assessment**

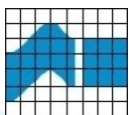
## **I. Economic and social analysis of the use of marine waters**

- Marine water accounts approach - used

## **II. Cost of degradation of the marine environment – under development**

- The Ecosystem service approach – under development

Background document: WG ESA guidance document (2010) : Economic and social analysis for the initial assessment for the Marine Strategy Framework Directive



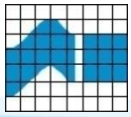
# **I. Economic and social analysis of the use of marine waters**

SECTORS and classification of activities (Data: Statistical office)

<b>Fisheries and mariculture</b>
<b>Maritime transport</b>
<b>Tourism</b>
<b>Extraction of salt</b>
<b>Settlement (Urbanisation)</b>
<b>Agriculture</b>
<b>Industry, Warehousing and storage</b>
<b>Defence - military</b>
<b>Coastal defence (Flood and erosion protection)</b>
<b>Other non-economic activities</b>
<b>Other activities</b>



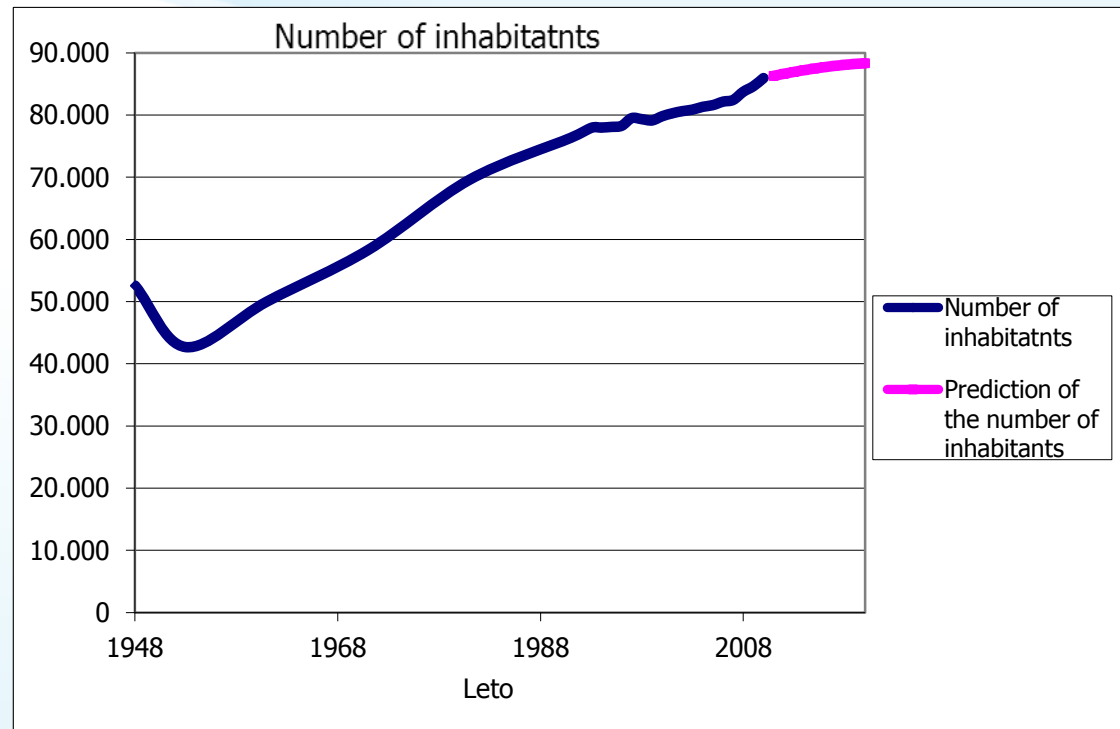
Sector	Nace Rev 2	Activities
<b>Fisheries and mariculture</b>	A 03.110	Marine fishing
	C 10.200	Processing and preserving of fish, crustaceans and molluscs
	A 03.210	Marine aquaculture
<b>Maritime transport</b>	H 50.100 H 50.200	Sea and coastal passenger water transport, Sea and coastal freight water transport
	H 52.220 H 52.240 H 52.290	Service activities incidental to water transportation, Cargo handling, Other transportation support activities
	C 30.1 C 33.15	Building of ships and boats, Repair and maintenance of ships and boats
	Q 93.291	Operation of marinas
<b>Tourism</b>	included in Q 93.299	Activities connected to baths, beaches, thermal rivieras)
	Q 93.190	Other sports activities (recreational, sports fishing included)
	N 77.21	Renting and leasing of recreational and sports goods
	N77.34	Renting and leasing of water transport equipment
	N 79	Travel agency, tour operator and other reservation service and related activities
	I	Accommodation and food service activities
	<b>Extraction of salt</b>	B08.930
<b>Settlement (Urbanisation)</b>	E	Water supply, sewerage, waste management and remediation activities
	Q	Human health and social work activities
	no classification	Other activities
<b>Agriculture</b>	A 01	Crop and animal production, hunting and related service activities
<b>Industry, Warehousing and storage</b>	C without C 10.200, C 30.1 C 33.15	Manufacturing in coastal regions without Processing and preserving of fish, crustaceans and molluscs,
	H 52.100	Warehousing and storage
<b>Other activities</b>	F	Construction
	H 49.100, H 49.200	Rail transport
	H 49.310, H 49.320, H 49.391, H49.410	Land transport
	G 47.301	Retail sale of own automotive fuel in specialised stores
	G 46.73	Wholesale of wood, construction materials and sanitary equipment
<b>Defence - military</b>	O 84.220	Defence activities
<b>Coastal defence (Flood and erosion protection)</b>	no classification	
<b>Other non-economic activities</b>	no classification	Leisure and recreation that is not included in economic activities (bathing, sport fishing, scuba diving and other recreational activities), Social values, upholding cultural tradition



# I. Economic and social analysis of the use of marine waters

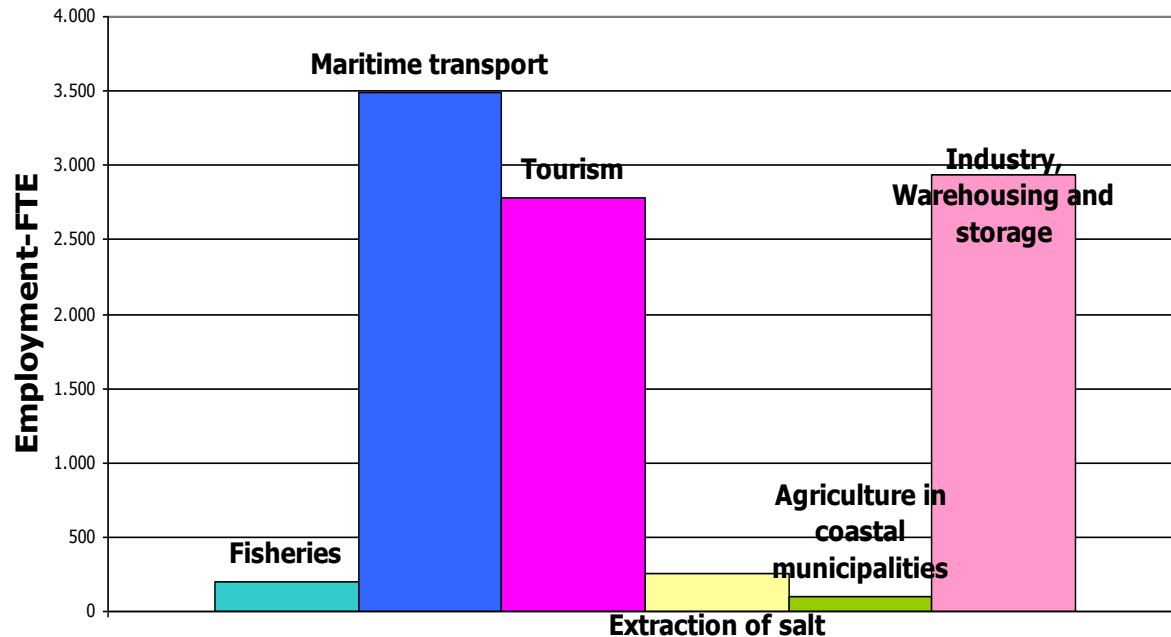
## Main characteristics of the Activity

- Spatial distribution
- Temporal nature
- Intensity
  
- Past trends of the Activity
- Future expected trends
  
- Value added
- Employment (FTE)
- Indirect effects
- Other benefits (Social benefits,...)



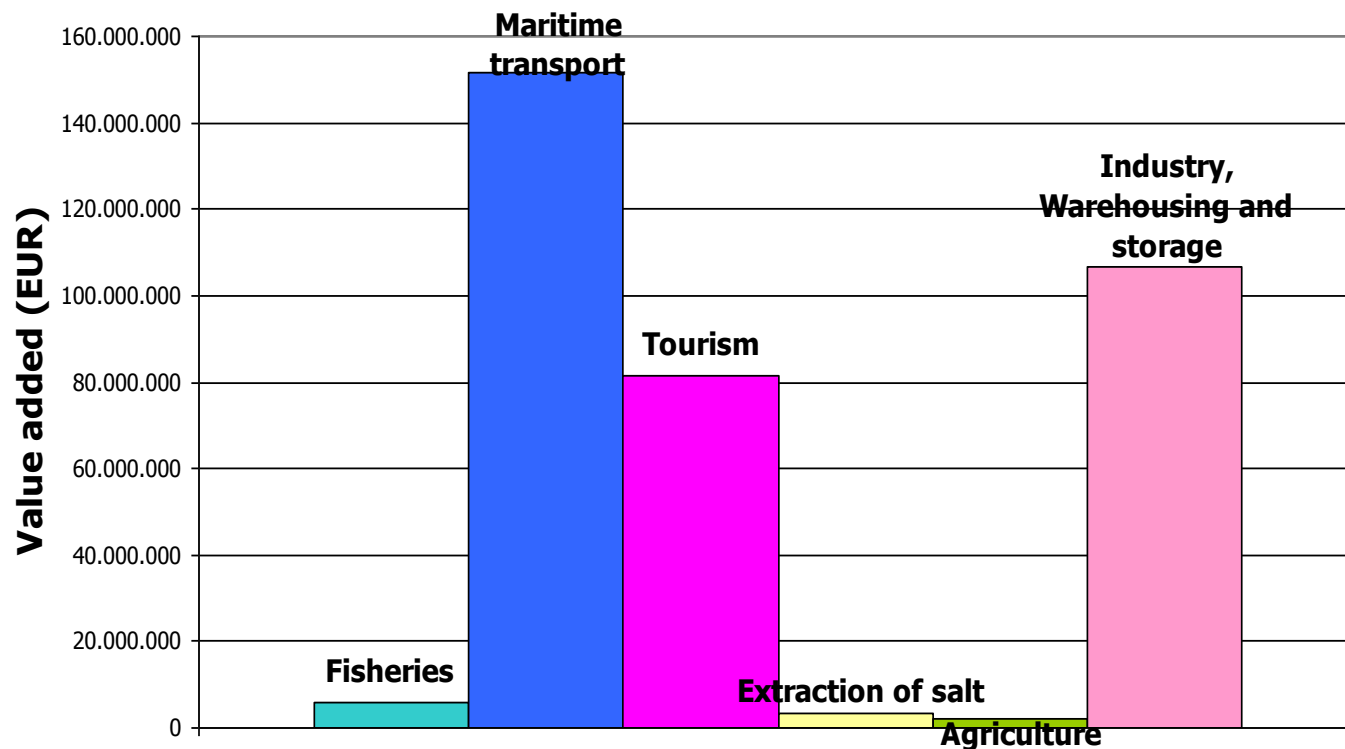
Source of data: Statistical Office of the Republic of Slovenia

# 3. SEA

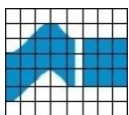


Use of marine waters on national level:

- Value added: 2% GVA
- Employment: 2% FTE



Source of data: Agency of the Republic of Slovenia for Public Legal Records and Related Services



## I. Economic and social analysis of the use of marine waters

### Examples of other benefits of the use of marine waters:

- Contribution to self-sufficiency (Fisheries and Mariculture, Agriculture)
- Benefits for socially deprived population (health care, resorts for children,...)
- Natural and cultural heritage (Fisheries, Traditional sea salt harvesting)
- Flood and erosion protection
- Education, Research

Foto: IzVRS



Foto: Blaž Velkavrh, IzVRS



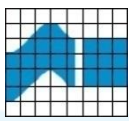
Foto: <http://www.bolnisnica-go.si>



Foto: IzVRS



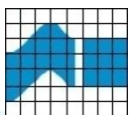
Foto: <http://www.termo-krka.si>



## II. ESA - analysis of the cost of degradation of the marine environment

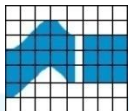
- List of Ecosystem services of marine environment in Slovenia
- Value of Ecosystem services
  - Fisheries resource rent
  - Resource rent in coastal tourism
  - Value of the benefits related to protection against coastal erosion
  - Value of the benefits related to waste treatment
- Guidance document: UNEP MAP: MANGOS, A., BASSINO, J-P., SAUZADE, D. (2010). The economic value of sustainable benefits rendered by the Mediterranean marine ecosystems, Plan Bleu
- Work is ongoing





# Programmes of measures (work in progress)

- Measures need to be taken in order to **achieve or maintain good environmental status**;
- measures shall be devised on the **basis of the initial assessment** and by reference to the environmental targets;
- *(com: many GES Targets not quantitative, use of precautionary principle)*
- measures have to be **cost-effective and technically feasible**;
- **impact assessments** shall be carried out;
- **cost-benefit analyses** should be done prior to the introduction of any **new measure**.



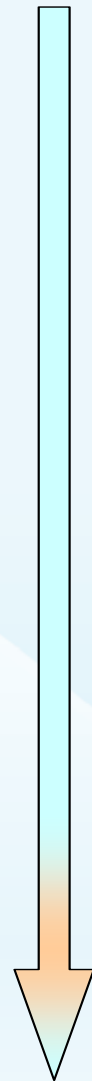
## Methodology

**State of the environment – based on analysis of monitoring data**

**Pressures and impacts on the environment – identification of risks**

**Baseline scenario**

- **Identification of trends in the state of environment**
- **Trends in social and economic development**
- **inventory of basic measures and their impacts on the environment**
- **Identification of gaps in existing policies**
- **definition of measures to fill the gaps**





## Types and categories of measures

TYPE	Example
TECHNICAL	Concrete actions in the environment (i.e. renaturation)
LEGISLATORY	Change of legislation
ECONOMIC	Economic incentives – to stimulate wanted behaviour (i.e. Separate waste collection...)
OTHER	Voluntary agreements with stakeholders (i.e. fishing for litter), communication, raising awareness

CATEGORY	Category	Costs	Cost effectiveness and cost benefit analysis
Existing measures, operational in the framework of existing legislation	1.a	Yes	No
Existing measures, NOT yet operational in the framework of existing legislation	1.b	Yes	No
Additional measures, supplementing existing measures	2.a	Yes	Yes
New measures	2.b	Yes	Yes

## Example: Marine litter EO10

### Draft environmental targets

**Target 10-2 : Reduction of ML quantities in the marine environment**

**Target 10-12 Identification of major sources of marine litter**



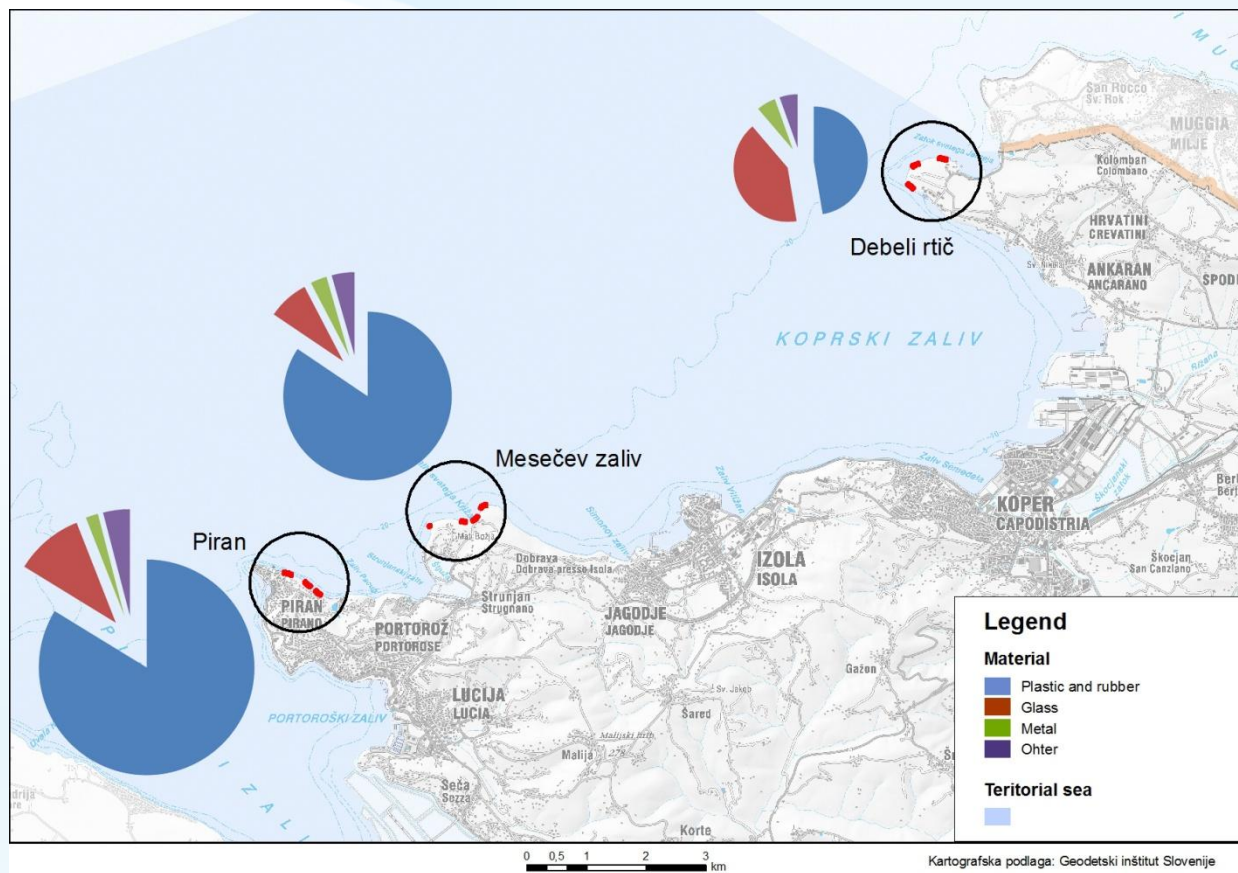


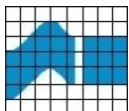
## Beach litter monitoring results

NAP(partly), ECAP

Data availability in 2012:

- beach litter
- floating litter and microplastic (floating and in beach sediment)
- data on litter ingestion - *Caretta caretta* (literature).





## Existing measures for marine litter (examples)

1a, 1b

... basic measures for prevention of litter emissions from LBS

..... Measures for reduction of litter emissions from landfills  
..... Polluter pays principle (to compensate for environmental damage)  
.... Green public procurement

1a

... measures for prevention of litter emissions from sea sources

.... Implementation of MARPOL Annex V  
.... Port reception facilities

1a

... for removal of existing marine litter from the environment

... Regular removal of coastal and floating litter

1b

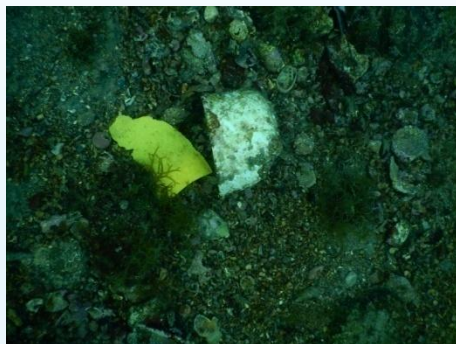
.... improvement of knowledge on the characteristics and impacts of ML, including their origin and dispersion

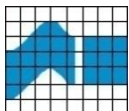
... National plan for ML monitoring and assessment



## Gap analysis of existing measures effectiveness

Environmental status regarding ML is not good





## Program of additional and new measures

**Pressures from land based sources were detected**

2a

... additional measures for prevention of litter emissions from LBS

**Pressures from marine sources detected**

2a

... additional measures for prevention of litter emissions from sea based sources

2a

... for removal of existing marine litter from the environment

2a

.... raising awareness and to some extent removal of litter

### Example

.... Inclusion of marine litter issue into national strategy for waste management

... Assess effectiveness of WWTP in removal of ML

.... deposit refund systems for fishermen (to return styrofoam boxes)

... Identification of hot spots, clean up & identification of sources

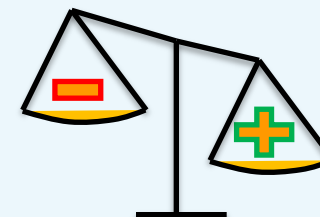
... Implementation of fishing for litter activities

... Voluntary coastal cleanup activities





## Economic analysis of Programs of measures



**COSTS**

**BENEFITS**

**Existing  
measures**

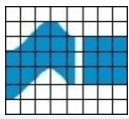
**Cost estimation + identification of  
sources for financing + impact  
assessment on economy and society**

**New measures**

**Cost effectiveness analysis (CEA)  
&  
Cost benefit analysis (CBA)**

**Marine litter  
&  
Underwater  
noise**

**semi-quantitative approach (NL&BE  
example), use of cost-effectiveness  
matrix**



# Economic analysis for PoM

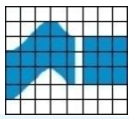
## Cost-effectiveness (CEA)

- use cost-effectiveness matrix

Effectiveness: effectiveness ranges 1-5; considering criteria:

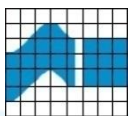
- 1) the importance of the use of the sea by the drivers,
- 2) the link between driver and pressure and
- (3) the expected impact of the measure (e.g. prohibition versus awareness raising),
- (4) geographic dimension of the pressure

Costs: cost ranges 1-5; ranges not defined yet



### Proposed methodology for cost benefits analysis (CBA):

- physical effects and welfare effects will be described, summarized (based on NE example) and linked to related ecosystem services;
  
- Planned quantification and monetisation methods (dependent on available data):
  - damage avoidance (Example: damage from derelict fishing gear ),
  - costs avoidance (lower costs for coastal cleanups),
  - benefit transfer



- Work on MSFD and WFD follows Ecap approach and fits well in the update of NAP's;
- There are still many gaps in knowledge, data and understanding in the implementation of MSFD:
  - GES is not yet quantitatively defined for many topics,
  - link GES and socio-economic aspects to define targets, perform CEA and CBA for new management measures is still a challenge;
  - assessment of marine sectors and related pressures needs to be further evolved.
- Process sets new challenges for data management and broad scope for general public participation and awareness raising activities.
- Proposed way forward is to prioritize existing gaps and plan work in 6 yearly cycles, assure continuity of work and exchange experience, active cooperation on regional level.

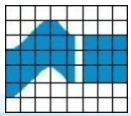


Foto: OMEGA Studio, Aleš primčič



Foto: UNIC-SUB, L. Fonda

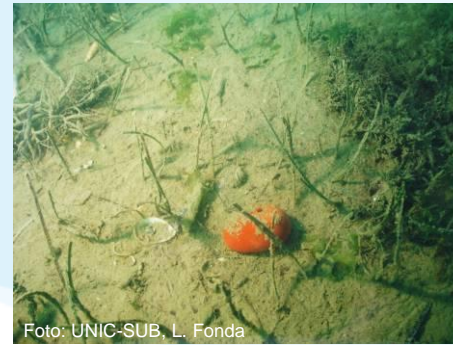


Foto: UNIC-SUB, L. Fonda



Foto: UNIC-SUB, L. Fonda

**Thank you for your  
attention!**

Regional meeting on applying methodology for  
programmes of measures and economic analysis in the NAP update 15/16  
11-13 May 2015

# Economic and Social Analysis of Use and Costs of Degradation of Marine Environment and Coastal Area

## CROATIA



# ESA – base for the common Strategy (Marine Strategy and ICZM Strategy)

## Tasks:

- Analyse (as much as possible) use of the marine and coastal environment
- Determine (as much as possible) costs of degradation of the marine and coastal environment

## Aim:

- provide detailed (as possible) insight into the economic and social use of the environment in the coastal area, as the basis for the
- common strategy (Marine and ICZM)

# METHODOLOGY

(Initial Assessment for the MSFD (2010): a non-binding guidance document):

## Step 1.: Use of resources

### Methods and approaches:

- Ecosystem Approach
- Water Account Approach
- Mixed Approach



# METODOLOGIJA

(Initial Assessment for the MSFD (2010): a non-binding guidance document):

## Step 2.: Cost of environmental degradation

### Methods and Approaches:

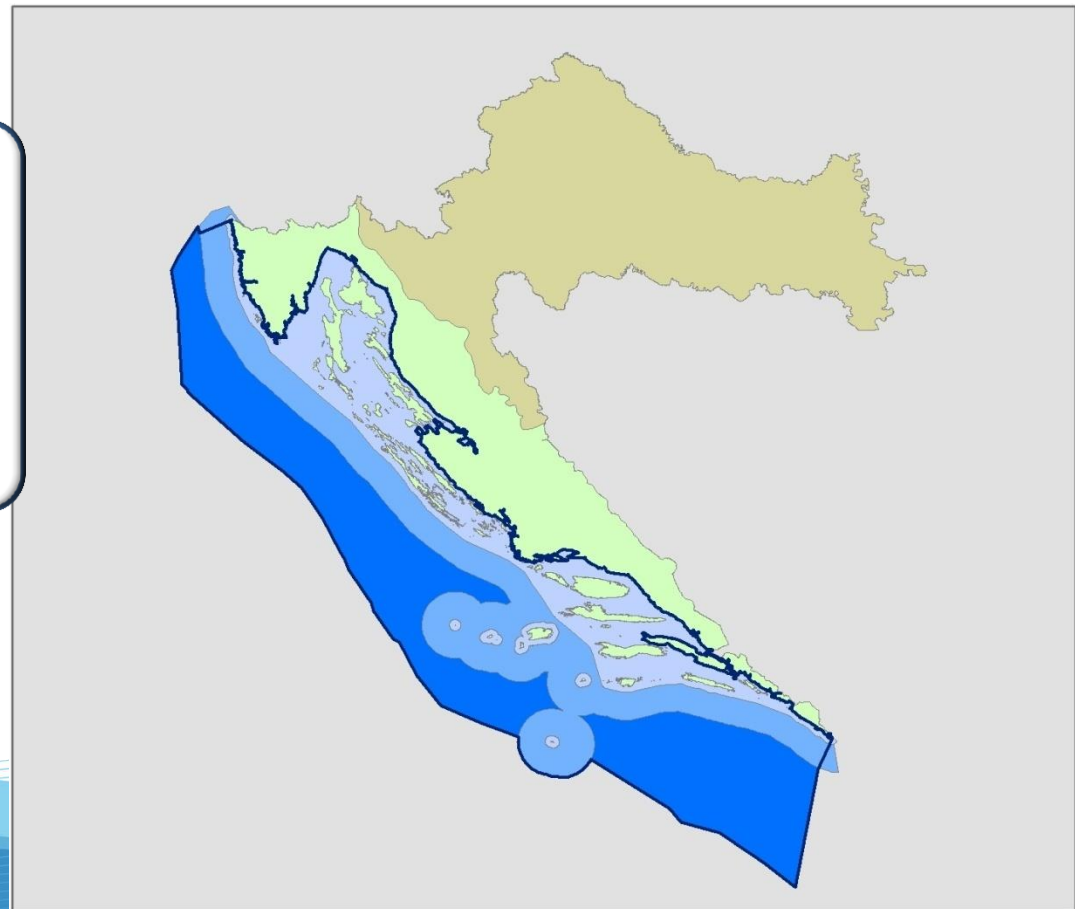
- Ecosystem Approach
- Thematic Approach
- Cost-based Approach
- Mixed Approach

# PROTOCOLS & DIRECTIVES

- MSFD

## Overlap with ICZM Protocol

Territorial waters (including internal sea waters) represent **57%** of the Croatian sea surface under MSFD



# PROTOCOLS & DIRECTIVES

- WFD

## Overlap with ICZM Protocol

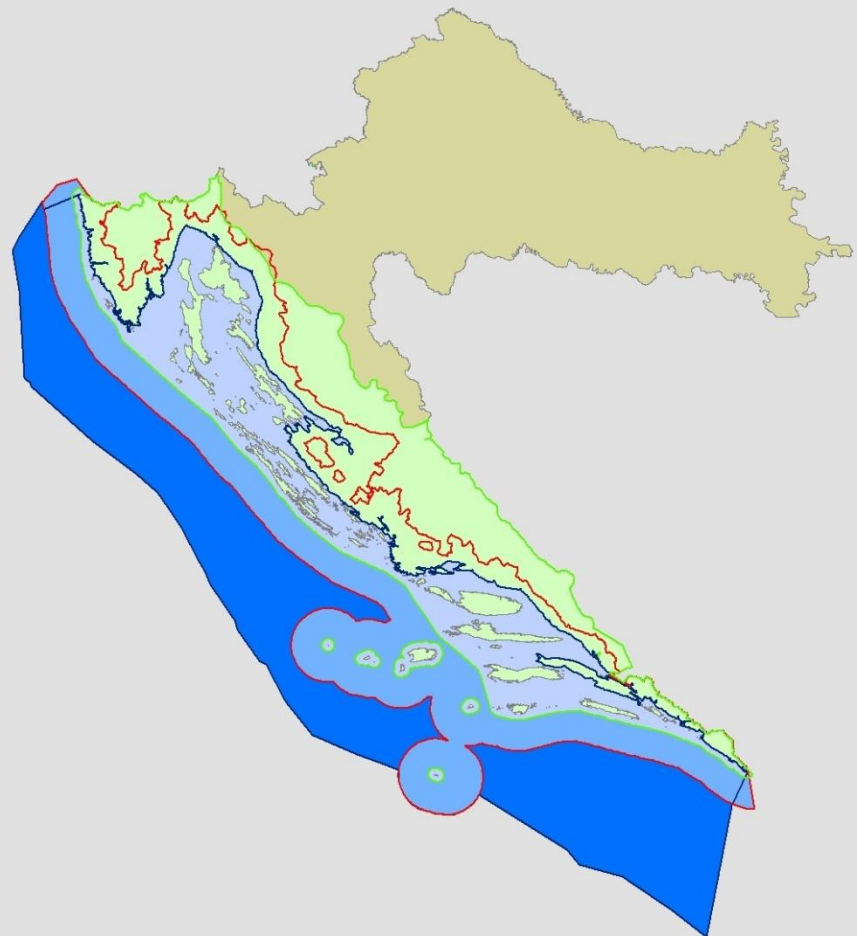
WFD covers 44% of the Croatian territorial waters

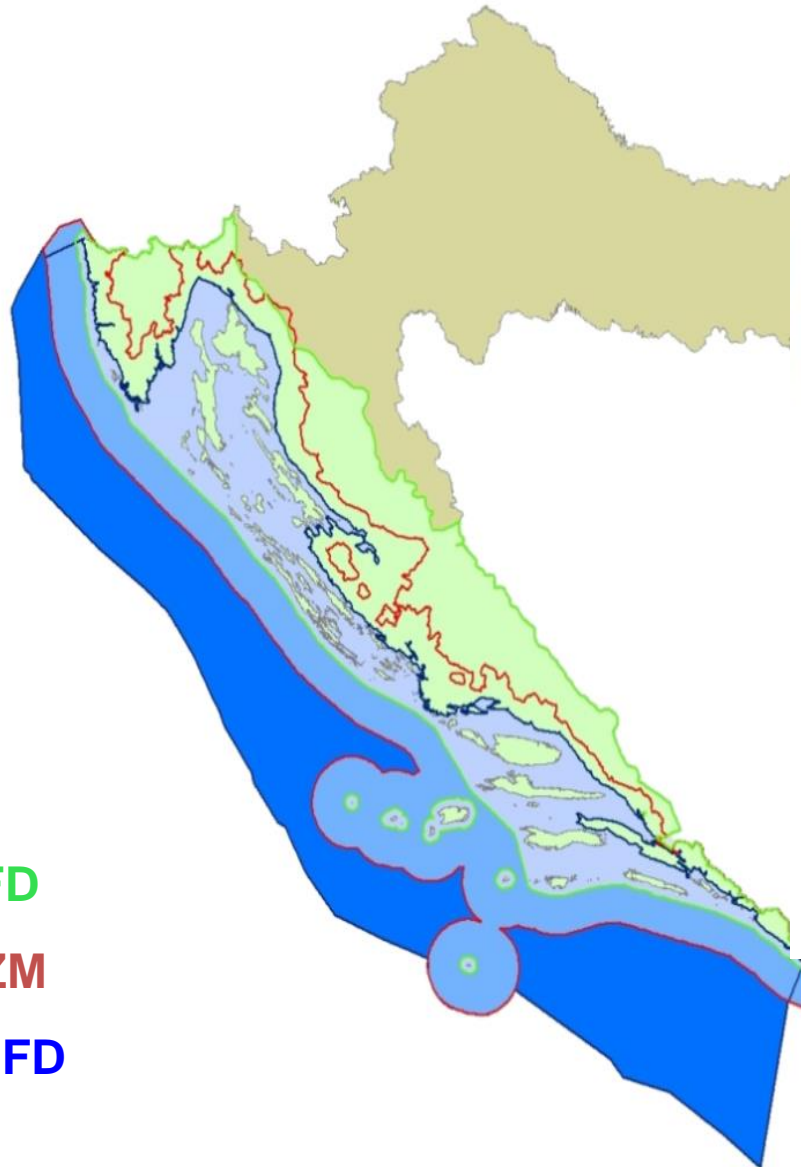


# PROTOCOLS & DIRECTIVES

- ICZM Protocol

139 LGUs (in 7 coastal counties)





WFD

ICZM

MSFD



Continental  
CRO

ICZM

REST OF  
Adriatic CRO



# First problems

- Area under study?
- Lack of data (sources, consistency, time series)
- Initial assessment of environment – only for marine environment, not coastal
  
- Conclusion:
  - Ecosystem approach not possible

# Some findings – CRO regions

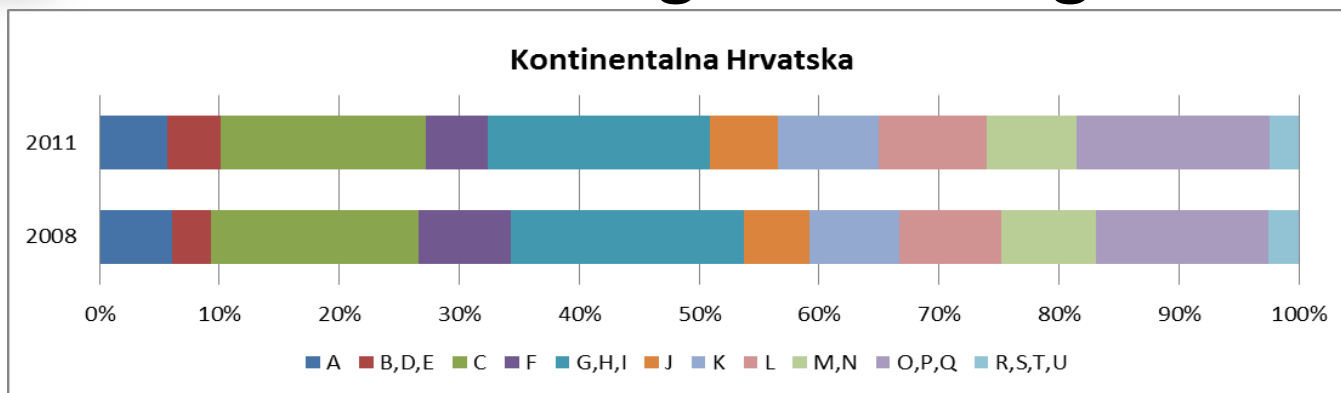
<b>Continental CRO</b>	<b>Total</b>	<b>% RC</b>
Surface - land (km <sup>2</sup> )	31.889	56,35
Population	2.872.954	67,05
Density (pop/km <sup>2</sup> )	90,09	119,01

<b>Adriatic CRO</b>	<b>Total</b>	<b>% RC</b>
Surface - land (km <sup>2</sup> )	24.705	43,65*
Surface - sea (km <sup>2</sup> )	31.479	39,91**
Population	1.411.935	32,95
Density (pop/km <sup>2</sup> )	57,15	75,50

\* In relation to total surface of land

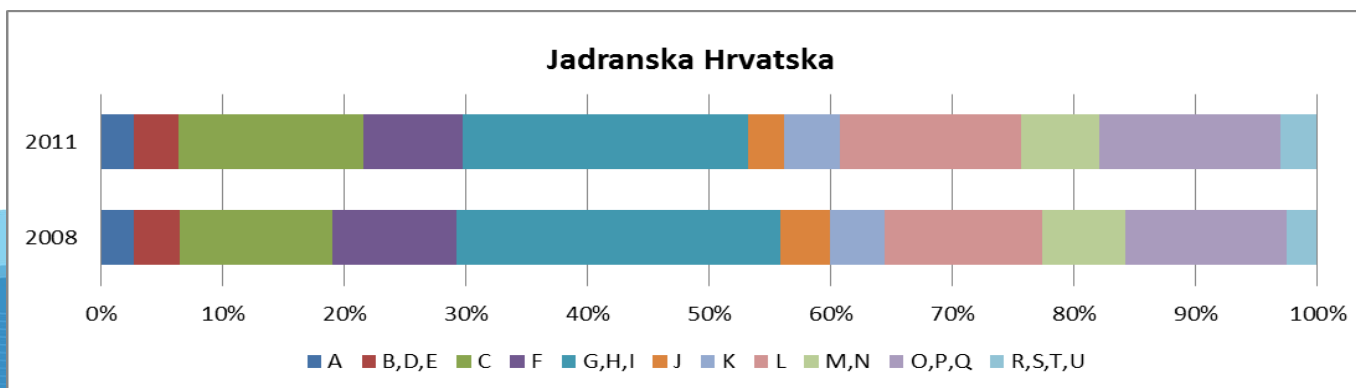
\*\* In relation to total CRO surface

# Some findings – CRO regions - GVA



**Continental CRO**

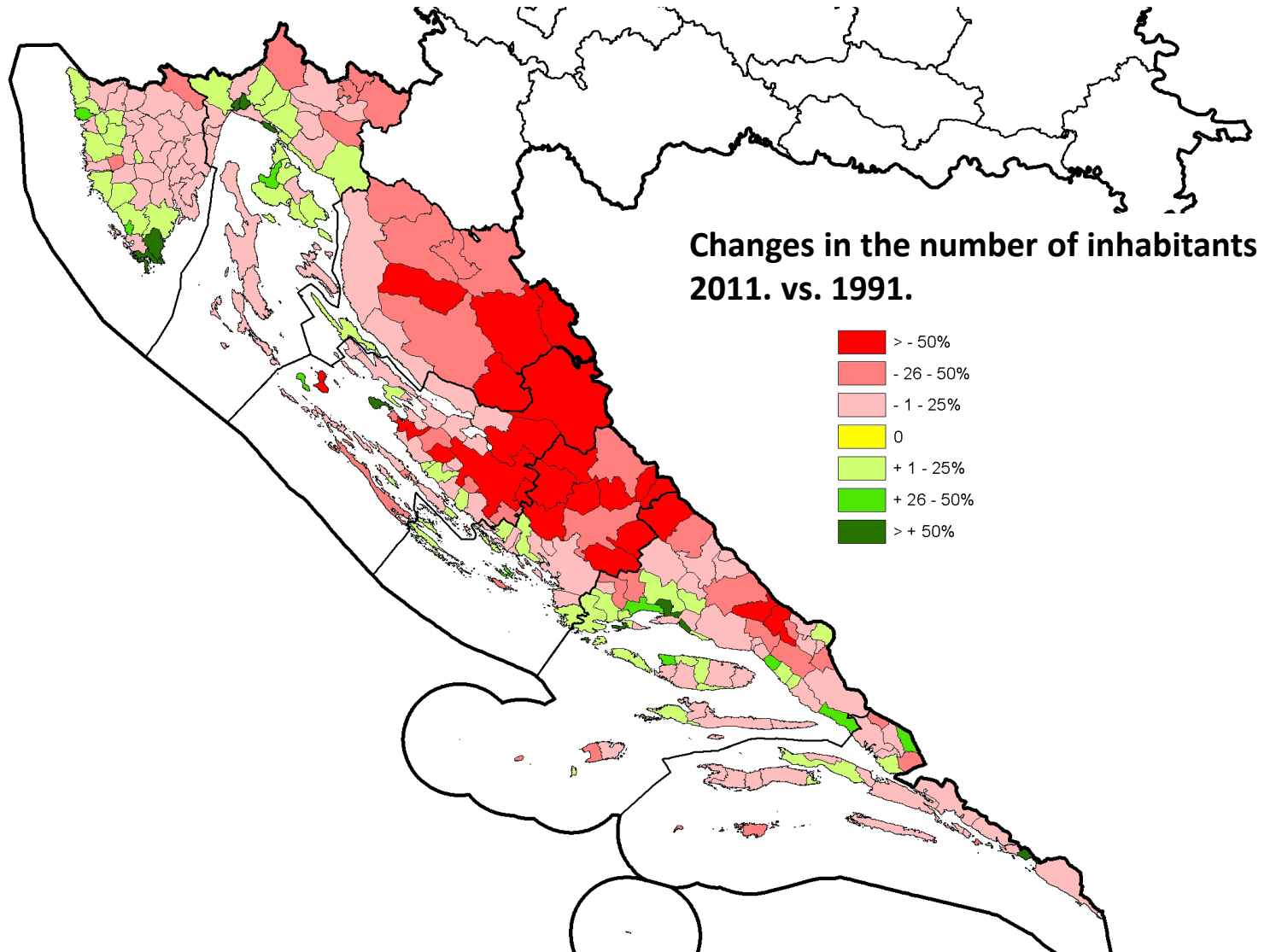
- A Agriculture, fishery, forestry
- B, D, E Mining, quarrying
- C Manufacturing
- F Construction
- G, H, I Trade, transport, warehousing, accommodation catering
- J Information and communication
- K Finance and insurance
- L Real estate
- M, N Professional, scientific and technical services; administrative and auxiliary services
- O, P, Q Public admin and defense, social insurance, education, health protection and social care
- R, S, T, UR Other services



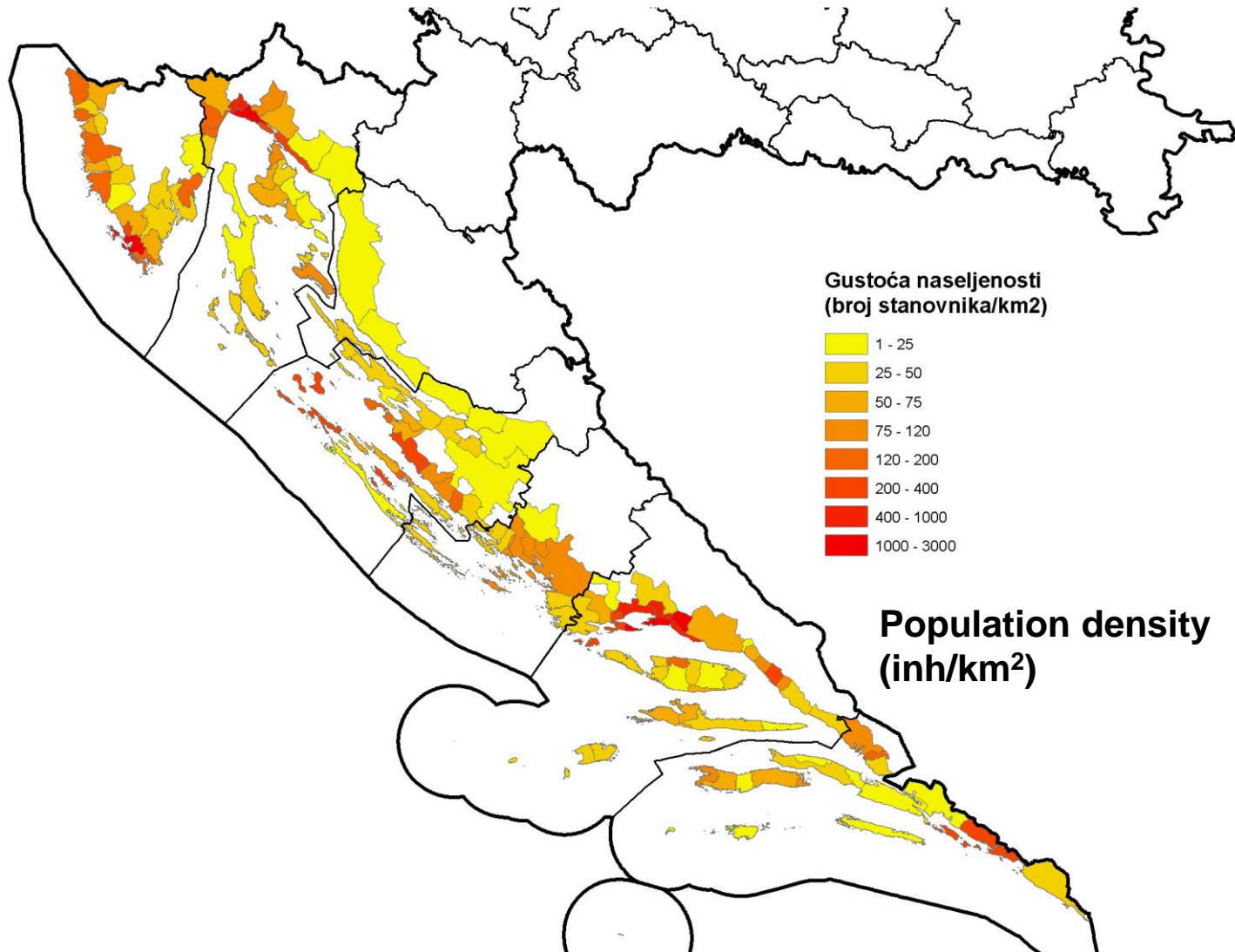
**Adriatic CRO**



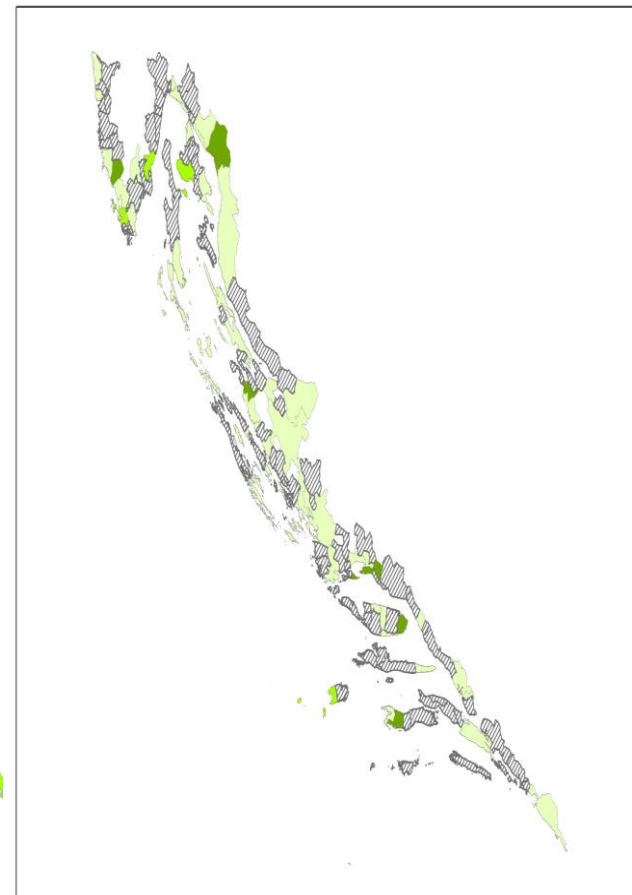
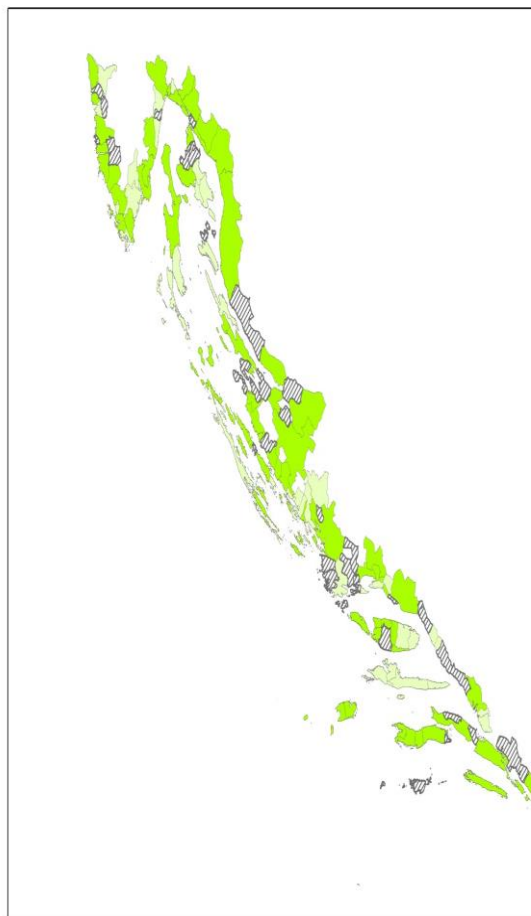
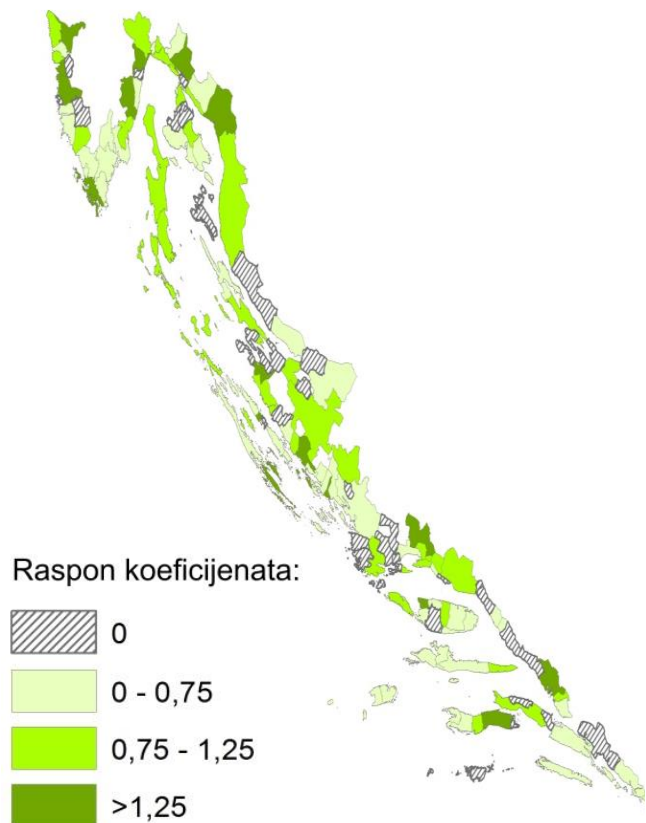
# ADRIATIC CRO



# COASTAL ZONE - CZ



# CZ – AGRICULTURE, FISHERY, FORESTRY

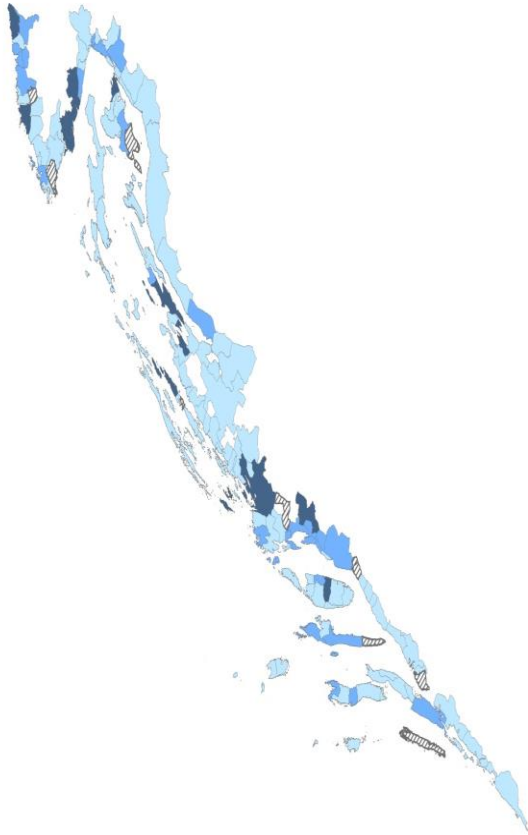


REVENUE/EMPL.

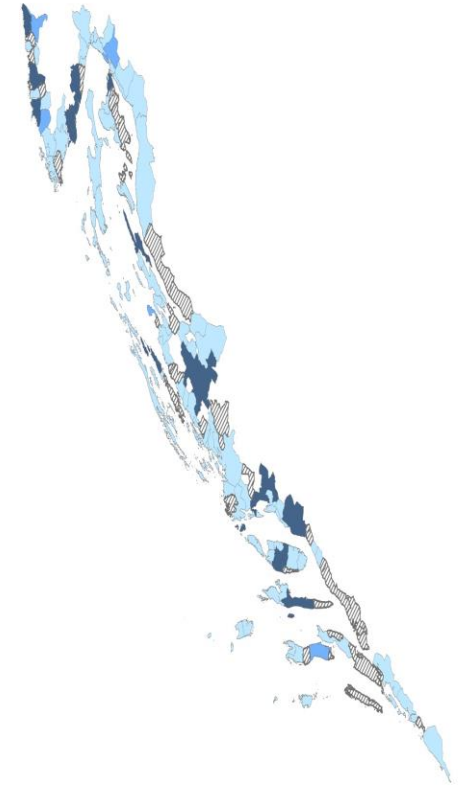
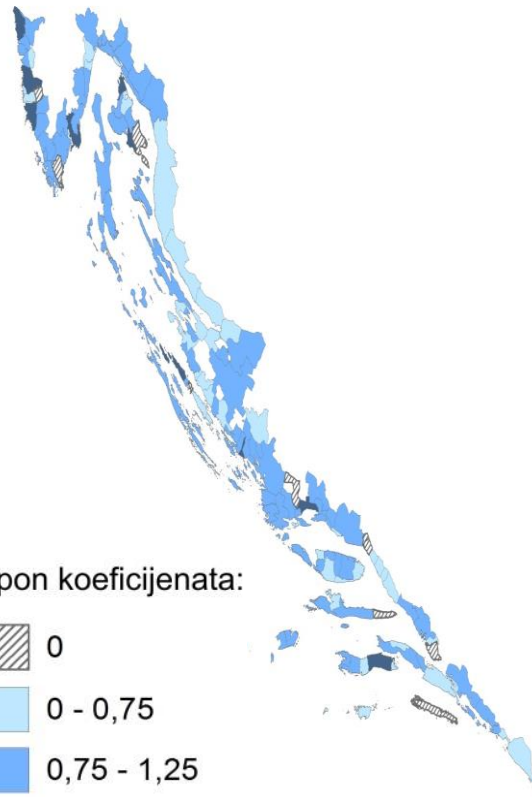
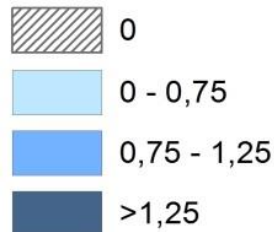
WAGE/EMPL.

ENV.EXP./EMPLY.

# CZ - MANUFACTURING



Raspon koeficijenata:

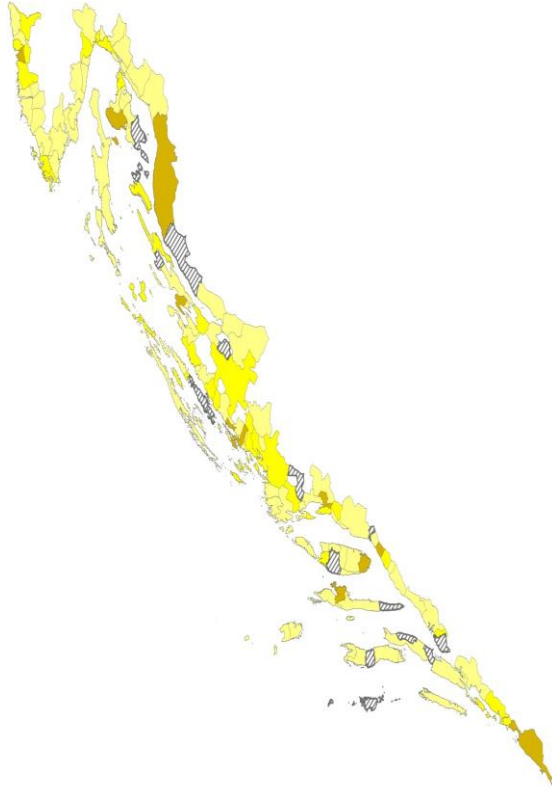


REVENUE/EMPL.

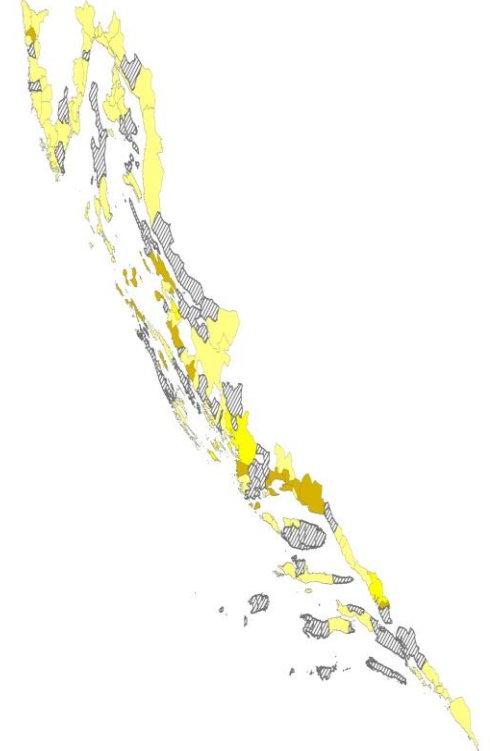
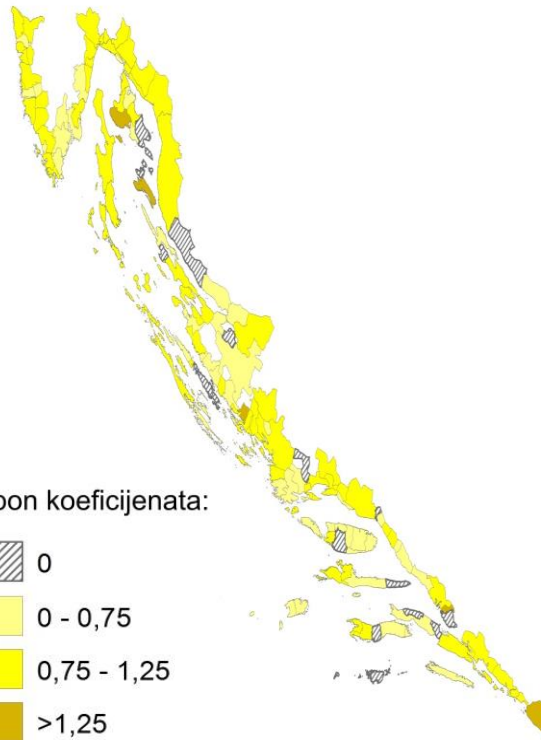
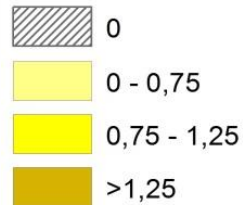
WAGE/EMPL.

ENV.EXP./EMPL.

# CZ - CONSTRUCTION



Raspon koeficijenta:

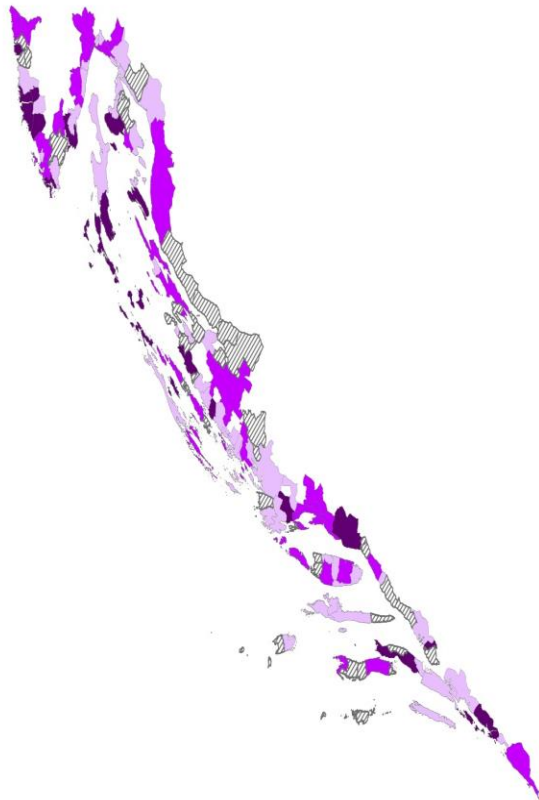


REVENUE/EMPL.

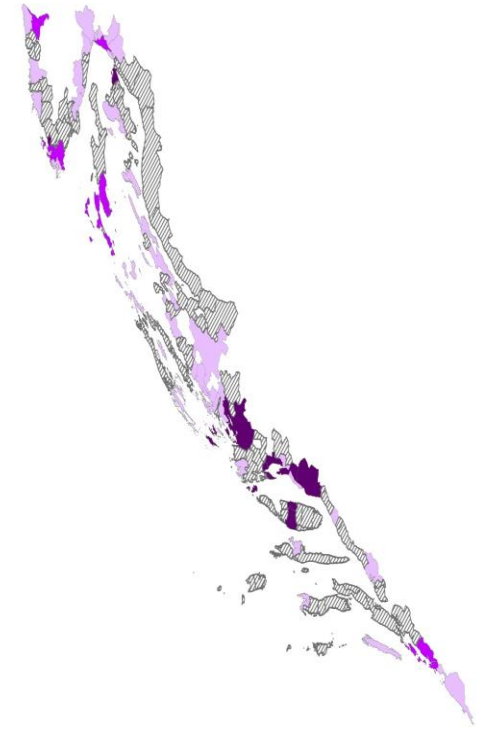
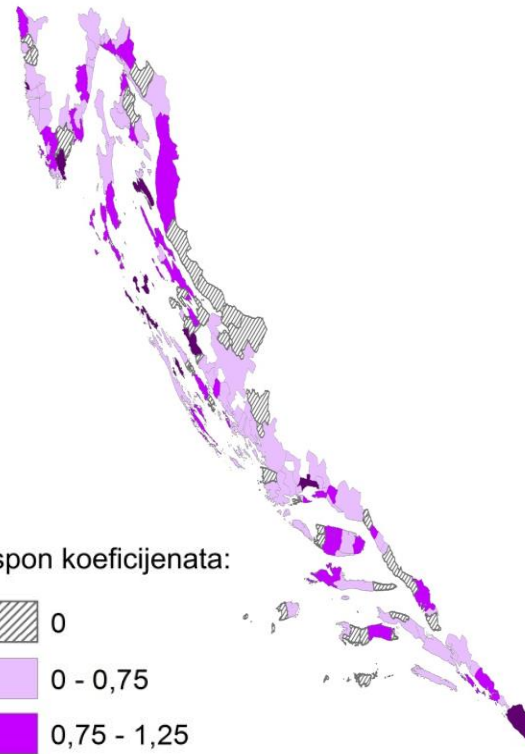
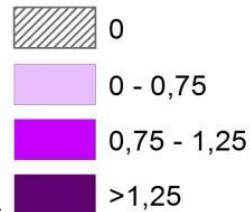
WAGE/EMPL.

ENV.EXP./EMPLY.

# CZ – TRANSPORT & WAREHOUSING



Raspon koeficijenata:

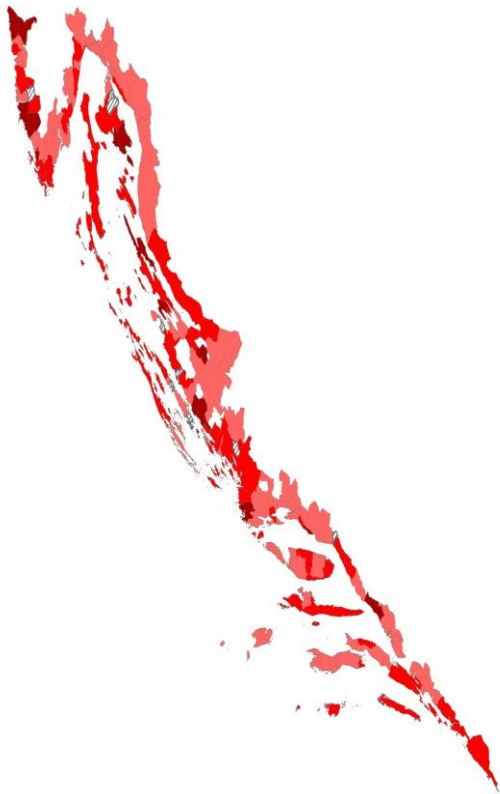


REVENUE/EMPL.

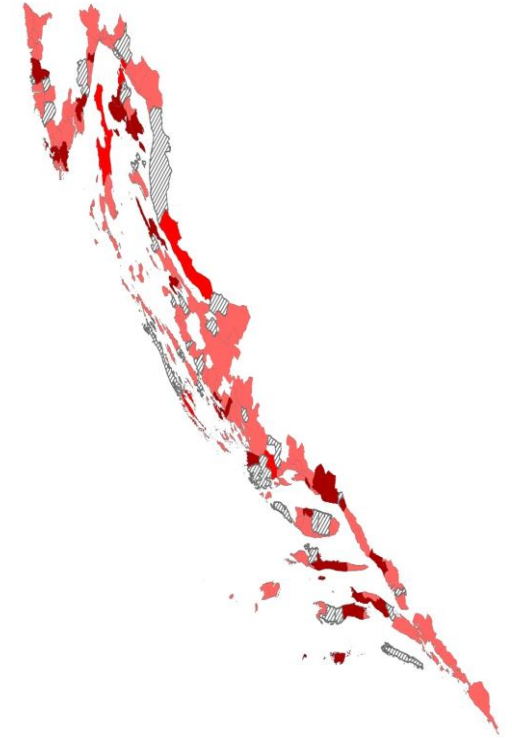
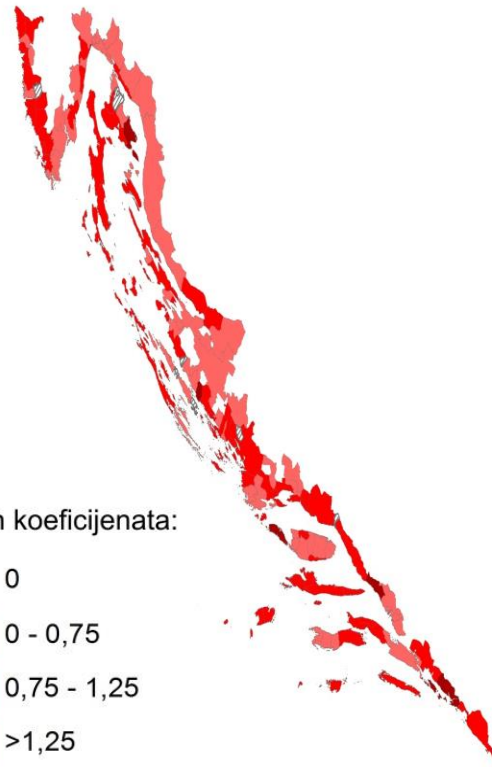
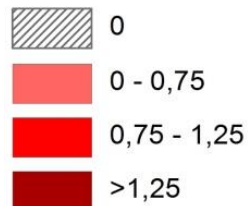
WAGE/EMPL.

ENV.EXP./EMPLY.

# CZ - TOURISM



Raspon koeficijenata:

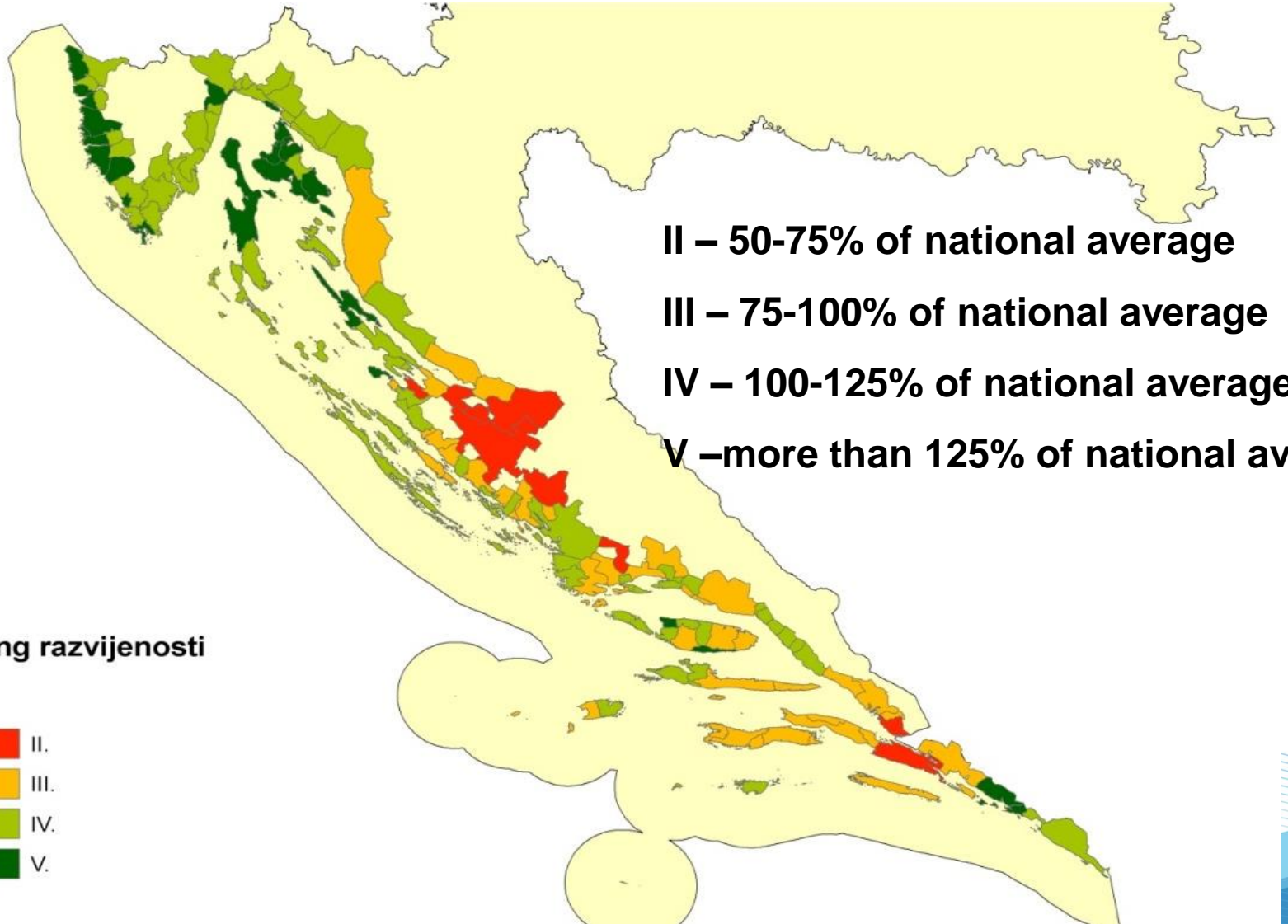


REVENUE/EMPL.

WAGE/EMPL.

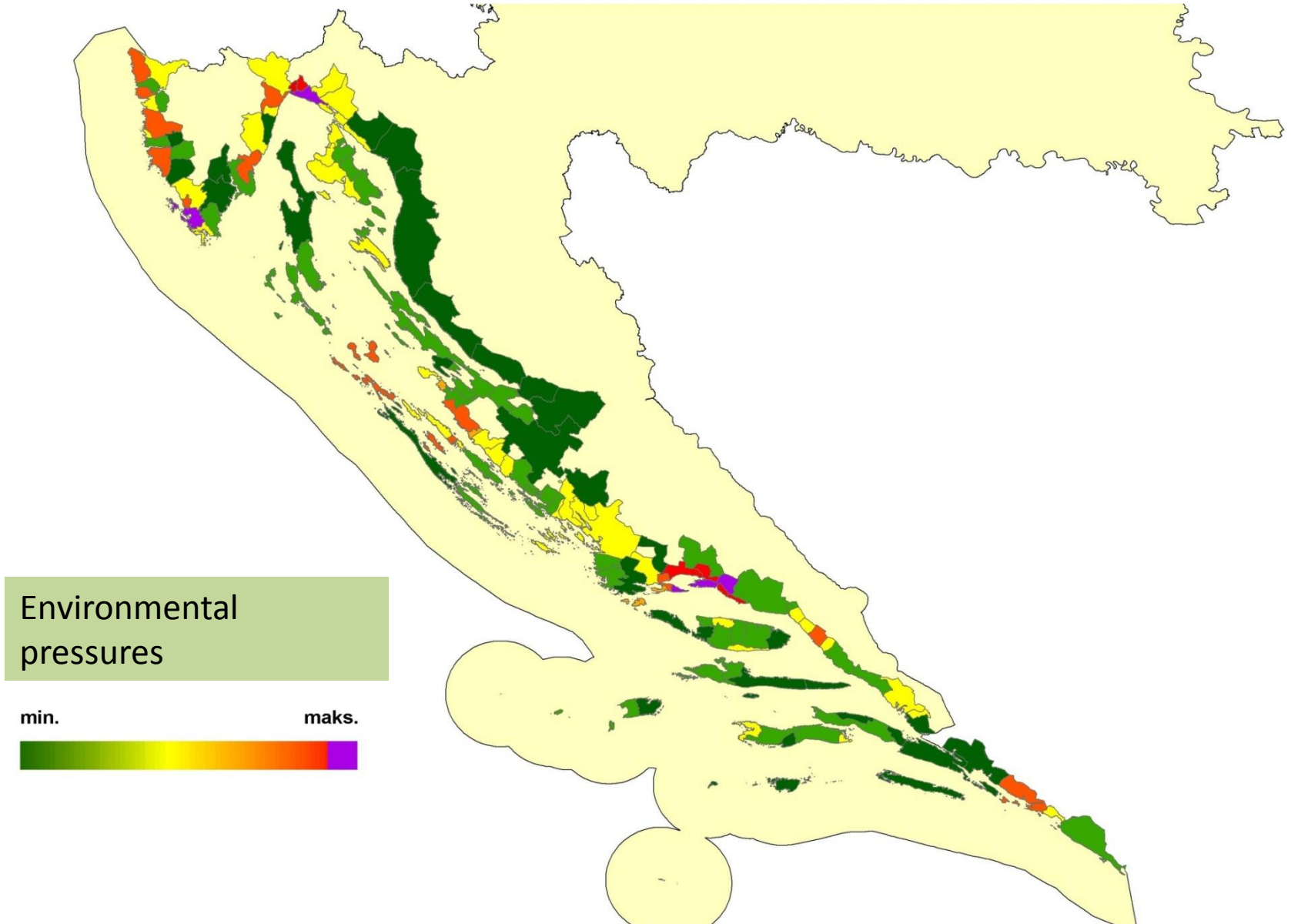
ENV.EXP./EMPL.

# CZ – LOCAL DEVELOPMENT INDEX

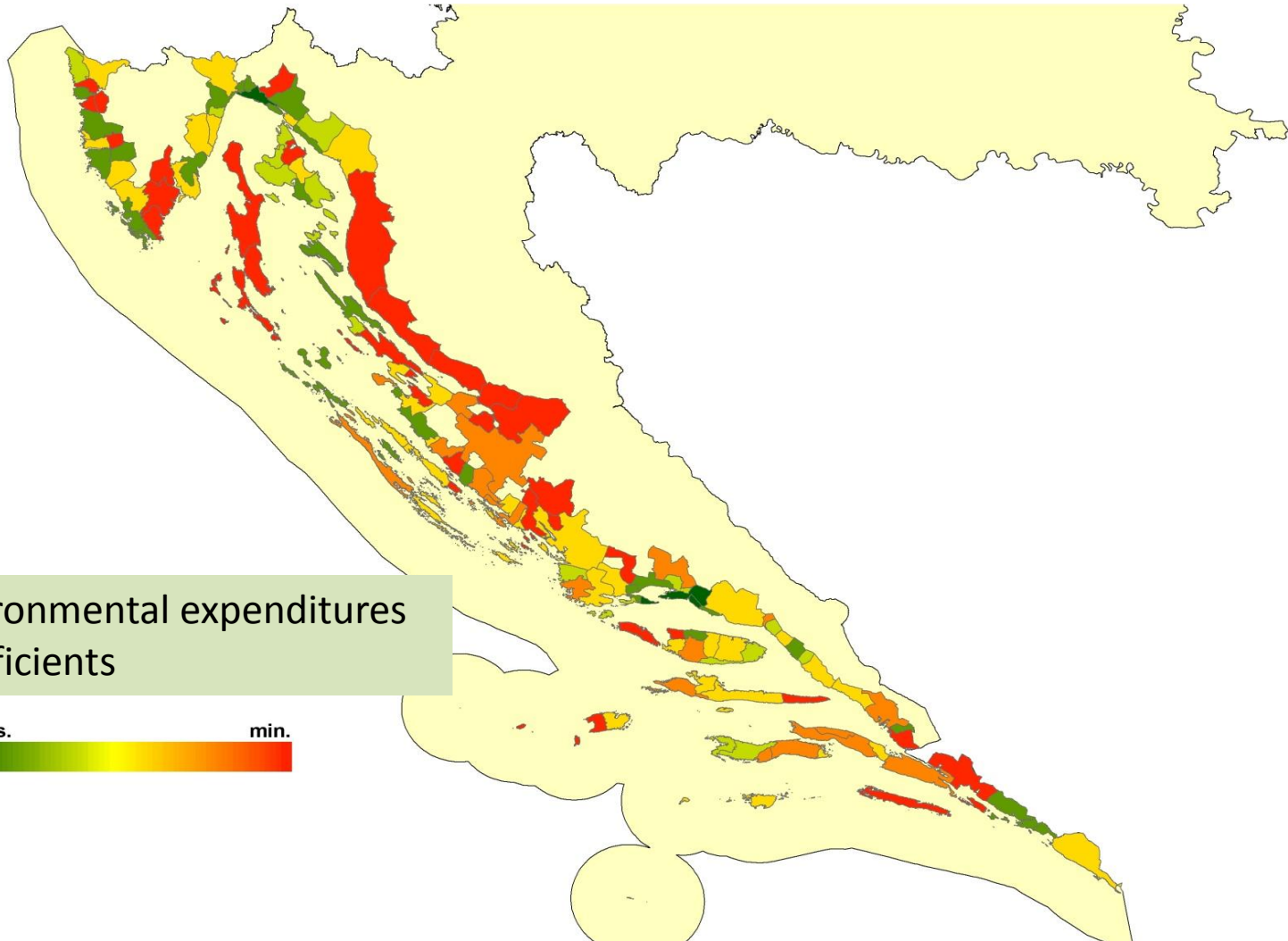




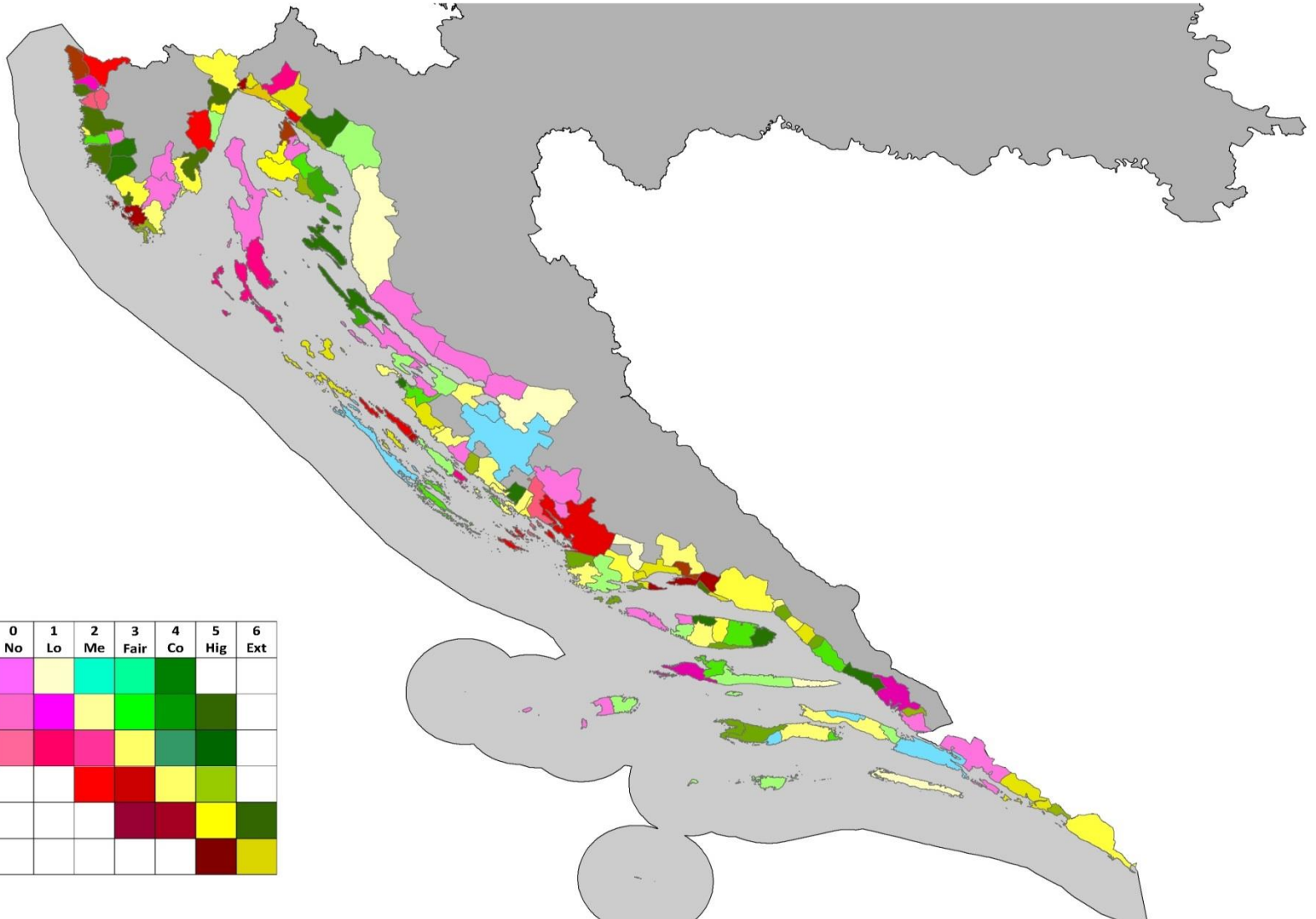
# CZ - PRESSURES



# CZ – ENVIRONMENTAL EXPENDITURES



# CZ – PRESSURES vs. ENV. EXP.



# Towards thematic approach

- **Water consumption in hotels**
  - overconsumption in Split-Dalmatia county in 2013; 4\* hotels: more than 1 million euro
- **Land-take for housing**
  - 1,83% of CZ, out of which:
    - 311 ha vineyards and 452 ha olive groves
    - Lost annual value of production of olive oil and vine: more than 2 million euro

# RECOMMENDATIONS

- ❖ Strategy scope
- ❖ Database and monitoring
- ❖ GES and descriptors for coastal zone
- ❖ Descriptors for good management status (GMS)
- ❖ Refine „environmental balance” idea

# RECOMMENDATIONS

## 1. Area under study – Strategy scope

Not as defined by the ICZM Protocol; rely on the counties, i.e. Adriatic Region as a whole – because of the policies implementation and management

# RECOMMENDATIONS

## 2. Data base

- Identify all data (including social)
- Elaborate collection methods, formats, institutions (ensure data coherence) and include in the existing programme for statistics (INSPIRE)
- Ensure availability of data to public

# RECOMMENDATIONS

## 3. GES and descriptors for coastal zone

Define descriptors according to those for marine environment

- Identify new/additional ones, such as:

: Developed economy with high employment

: Balanced economic structure and minimal land take

: Energy production based on the renewable resources



# RECOMMENDATIONS

## 4. Monitoring

- Create unique information platform
- Create DSS for policy simulations
- Elaborate costs and effectiveness of the system

# RECOMMENDATIONS

## 5. Good Management Status (GMS)

- Define indicators/descriptors to express the effectiveness and efficiency of the CZ and marine management system

# RECOMMENDATIONS

## 6. Towards methodological improvements

- Refine the “environmental balance” idea
- Use it, within DSS, as the basis for the formulation of various policy measures, as well as evaluation of their affordability and impacts (both on environment and development)

# UNEP/ MAP Guidance on CEA and CBA – Appendix G of the NAP update *Guidelines*

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Part 1: Deciding on the appropriate tools and levels of analysis, designing the steps and compiling information in the course of midterm assessment

NAP update meeting

11 – 13 May 2015, Athens



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# Why conduct economic analysis (EA)?

---

- UNEP/ MAP and UfM mid-term assessments of NAP/ SAP implementation indicated slow progress with implementation of some measures
- Updated NAP portfolio expected to be more complex/ diverse due to
  - ECAP GES
  - Regional Plans

... therefore the need to select the most effective measures

- Integrated approach (links between human activities – state of the environment – responses)
- Improve the funding prospects (financial sustainability of NAPs)
- Ensure best possible allocation of (limited) resources
- Convince stakeholders it is worth to invest in environmental protection
- Focus on the most efficient (costs, benefits/ impacts) ways to reach GES



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# What are CEA and CBA?

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## Cost-effectiveness analysis (CEA)

- Analysis of the costs of alternative measures designed to meet a well specified/ quantified objective
  - dividing the costs of measures/ sets of measures by a quantified physical effect
- Helps find the least-cost solution for meeting a prescribed target

## Cost-benefit analysis (CBA)

- Compares measures/ projects/ policy options in terms of their advantages (benefits) and disadvantages (costs)
  - all of the negative and positive economic, social and environmental impacts are considered – monetisation (full scale CBA)
  - benefit to cost (B-C) ratio (total benefits divided by total costs); when  $> 1$ , measure is beneficial
  - net present value (NPV); positive NPV indicates a welfare improvement

## Both tools can be applied as:

- Quantitative (full monetisation of costs and benefits)
- Semi-quantitative (e.g. estimation of costs, qualitative assessment/ scoring for effects)
- Qualitative level (e.g. matrices with categories of costs and benefits – +++ / ---)



# Questions to guide decisions on the scope, type and role of EA tools in the NAP update

---

- Availability of data, time and capacities?
- What is appropriate form of analysis (quantitative, semi-quantitative or qualitative)?
- Specific tools (CEA, CBA or alternatives) to be used?
- What role will they play:
  - inform policy makers and other stakeholders?
  - additional criteria for selecting final programme of measures?
- At which level should selected tool/s be applied:
  - for sets of measures identified under individual target?
  - for choosing between various policy approaches (or sets of measures) to address specific environmental problem (e.g. concentration of pollutants in a given hot spot area), identified gaps and/ or issues?



# How to integrate EA in the NAP update

---

## Assessment of midterm baseline

- analyse human activities that depend on marine environment; compile data
- analyse implementation of the original NAP from economic/ financing perspective (country fact sheets, SAP/ NAP mid-term evaluation, UfM study as starting points)

## Analysis of gaps, prioritization of issues and target setting

- describe in qualitative and, if possible, in quantitative terms the costs that are expected to occur if the status of marine waters and ecosystems deteriorates
- use costs of degradation to prioritise issues
- use EA to derive a realistic set of operational targets until 2025

## Development of programme of measures

- estimate costs of shortlisted measures
- undertake economic analysis of shortlisted measures as appropriate: (to the applicable/ practicable extent) conduct CEA or CBA (or use alternative tools)
- select final NAP programme of measures based on economic analysis

**NAP update team: work together to identify and organise available data to describe linkages between uses and status of marine environment**



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# Main functions of economic analysis in the NAP update

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- link the assessment of midterm baseline, setting of objectives and operational targets, as well as identification and prioritisation of pollution reduction and control measures to socio-economic conditions in a given country, thus making the overall analysis more sound
- aid decision making on final selection of the programme of measures by providing information on costs and benefits of different measures/ policy options
- strengthen implementation prospects for the updated NAP and contribute to its overall financial sustainability.



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# Economic analysis in the midterm assessment

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- Identify and describe different uses of marine environment and link to related pressures and impacts
- Discuss trends (pressures and impacts)
- Assess direct and indirect benefits of different uses of marine environment
- When identifying issues (that e.g. prevented implementation of original NAP measures), group/ single out economic, fiscal, financial ones
  - funding available?
  - incentives and/ or pollution charges (economic instruments) in place?
  - tariffs adequate for sustainable financing of environmental infrastructure?



# EA in the midterm assessment – what information?

---

- Distribution of population and key economic sectors and sub-sectors
- Standard measures of benefits (revenues, turnover, gross value added, employment, direct and indirect contribution to GDP) but also (if possible) data on value of services provided by ecosystems
- Pressures in economic terms (e.g. size of fishing fleet, total catches, number of overnight stays of tourists, type and capacity of tourist accommodation, type and size of coastal industries) and **impacts**
- Expected trends (demography, economy) with related pressures and impacts within the time span of the updated NAP

**Compile information needed to estimate costs of Regional Plans implementation (UNEP(DEPI)/MED WG.414/4)!**



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# Identification of impacts – Plan Blue ESA

Ecological Objectives (EO)		Fisheries	Aquaculture	Tourism and Recreational Activities	Maritime transport	Offshore extraction of oil and gas
		Fishing activity, bycatches and discards		Coastal dev. and construction of infrastructure and Recreation		Presence of structures and operations & Marine pollution
EO1	Biological diversity	X	X	X	X	X
EO2	Non - indigenous species	X	X		X	X
EO3	Commercial species	X	X	X		
EO4	Food webs	X				
EO5	Eutrophication		X	X	X	
EO6	Sea - floor	X	X	X	X	X
EO7	Hydrographic conditions	X	X	X		X
EO8	Coastal areas's natural dynamics			X		X
EO9	Contaminants	X	X	X	X	X
EO10	Marine Litter	X	X	X	X	X
EO11	Noise	X		X	X	X

# Simplified example for assessment of impacts (if not available from other segments of analysis)

Economic sector/ subsector	Physical impacts		Chemical impacts			Biological impacts		
	Sea floor	Disturbance	Eutroph	Contamin	...	MPA	NIS	...
<b>1. Fishing</b>								
1.a. Commercial	5	3	1	1				
1.b. Recreational								
<b>2. Aquaculture</b>								
2.a. Enclosed water			5				4	
2.b. Open sea			3				2	
<b>3. Tourism</b>			5			5		
<b>4. Industry</b>								
4.a. Wineries			5					
4.b. Plants using mercury				5				

# Examples to illustrate what to aim for in midterm assessment

---

Source: Plan Bleu Socio-economic Assessment for the Mediterranean – ESA report (includes information on all economic sectors)

“... circa **73 000 fishing vessels** operate in the Mediterranean Sea, accounting for **6 million tons in terms of deadweight tonnage**. A large share of the fleet recorded is made up of small-scale artisanal boats (80%).

Fish landings in the region almost reached **1 million tons in 2011** (around 1% of total world captures), and were mainly composed of small pelagics and demersal species.

In relation to production value, Mediterranean catches generated in 2008 **direct gross revenues of 3 200 million Euros** which rose up to **9 700 million Euros in terms of total (direct, indirect and induced) impacts**. **Gross value added exceeded 2 000 million Euros.**”



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# Challenges faced in socio-economic assessments

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## **Lack of data in general and disaggregated at the level of analysed area** (hydrological basin, administrative units):

- Value of ecosystem services (indirect benefits)
- Data related to tourism, employment may not be readily available for coastal area
- Links between drivers/ pressures and impacts – complexity of marine environment

## **How to overcome them in NAP update:**

- Be resourceful (identify all useful sources of information)
- Extrapolate
- Estimate
- Cooperate closely with other experts, thematic groups
- Present key issues to Steering Committee and seek guidance

# Costs of degradation – possible approaches

(based on Plan Bleu's *Scoping study for the assessment of the costs of degradation of the Mediterranean marine ecosystems*)

The ecosystem services approach	The thematic approach	The cost-based approach
<ol style="list-style-type: none"><li>1. Define GES (descriptors listed in the MSFD)</li><li>2. Assess the environmental status in a Business As Usual (BAU) scenario.</li><li>3. Describe in qualitative and, if possible, quantitative terms the difference between the GES and the environmental status in the BAU scenario, i.e. the degradation of the marine environment.</li><li>4. Describe the consequences to human well-being of degradation of the marine environment, either qualitatively, quantitatively or in monetary terms.</li></ol>	<ol style="list-style-type: none"><li>1. Define degradation themes, e.g. marine litter, chemical compounds etc.;</li><li>2. Define a reference condition (condition where targets for good environmental status are achieved);</li><li>3. Describe in qualitative and, if possible, quantitative terms the difference between the reference condition and the present environmental status for all the degradation themes;</li><li>4. Describe the consequences to human well-being of degradation of the marine environment, either qualitatively, quantitatively or in monetary terms.</li></ol>	<ol style="list-style-type: none"><li>1. Identify all current legislation that is intended to improve the marine environment;</li><li>2. Assess the costs of this legislation to the public and private sectors;</li><li>3. Assess the proportion of this legislation that can be justified on the basis of its effect on the marine environment (as opposed to health or on-shore environmental effects);</li><li>4. Add together costs that are attributable to protecting the marine environment from all the different legislation you have assessed.</li></ol>



# Examples to illustrate how to approach assessment of costs of degradation

---

## ReGoKo results for costs of degradation

### Lebanon pilot study

- Assessment of costs related to poor bathing water quality at Ramlet-el-Bayda beach through additional medical costs born by those who contracted diseases
  - cca USD 340,000 per year
- Review of other available studies
  - 2006 oil spill in the Mediterranean – costs for Lebanon USD 729 mil
  - costs of environmental degradation of the Lebanese Northern Coastal Zone – USD 102 mil per year

Source: *Governance and Knowledge Generation: Socio-economic Evaluation of Maritime Activities, report for Lebanon (Jan 2015)*



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# Examples to illustrate how to approach assessment of costs of degradation

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## Croatian ESA

Reasons for using cost-based approach:

- the other approaches not possible as GES not defined
- not possible to quantify links between human activities and impacts
- difficult to project economic growth

Costs of existing and/ or planned environmental protection measures assessed as a proxy for costs of degradation

- Difficulties (costs on national – regional – local level)

Data on costs per administrative units linked to data on pressures - findings mapped

Source: *Socio-economic analysis of the uses and costs of degradation of marine environment and coastal area* (proposal, December 2014)



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# Examples to illustrate how to approach assessment of costs of degradation

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## Greece – ecosystem services approach

- 3 scenarios of degradation, 3 discount rates tested (2.38% used)
- Results

Maximum cumulative losses in % of GDP	Production value	Added value
Fisheries	0.07	0.03
Aquaculture	0.07	0.01
Processing	0.04	0.03
Tourism	0.81	0.15
Beaches	0.29	
Ports	0.002	

Source: Plan Bleu's *Scoping study for the assessment of the costs of degradation of the Mediterranean marine ecosystems*



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# The most challenging aspects of the full scale economic analysis

---

## 1. Costing of measures

- Type of measures
- Break down into inputs
- Use existing sources for unit costs

## 2. Full monetisation of costs and benefits (valuation of non-market goods and services)

- Different valuation methods, pros and cons
- Make best use of existing valuation studies

## 3. Discounting

- Controversial
- Apply sensitivity analysis
- Whatever the choice of discount rate – explain the reasons



# Costing of measures

---

- Approaches to costing the implementation of RPs (UNEP(DEPI)/MED WG.414/4); some advices in the *NAP Guidelines, Appendix G*

## KEY STEPS: DISAGGREGATION, UNIT COSTS

- Technical measures
  - Costs per p.e., other physical units – km of sewage system, recycling station
  - Sources: WW and SWM strategies, feasibility studies, UNEP/ MAP Background document on MLRP (indicative costs)
- Legislative measures
  - Public (costs of passing and enforcing regulations) and private (compliance) costs
- Policy instruments
  - E.g. tax breaks, pollution charges
- Capacity building and awareness raising measures
  - Capacity building needs (training, equipment, etc.), publications costs, media time and similar



# Valuation (overall value of ecosystem services or value of changes in ecosystem services)

---

## Types of values

- use (actual/ planned use, direct or indirect, and option value)
- non-use (for others, existence values)

## Main groups of valuation techniques:

- stated preferences (questionnaires to elicit individuals' preferences)
- revealed preferences (market prices, travel cost method...)

## Classification (CICES) of ecosystem services:

1. Provisioning (nutrition, materials, energy)
2. Regulating and maintenance (acceptance/ breakdown of waste, carbon sequestration, flood protection, maintenance of physical, chemical and biological conditions)
3. Cultural (recreation, aesthetic,... existence, bequest)



# Discounting

---

- Method used to value at the same date costs and benefits occurring at different points in time
- Private and social discount rates
- Choice of discount rate may significantly affect results of analysis (justify the choice, perform sensitivity analysis)
- EC (WG ESA) 2010 Guidance document:

<b>Time horizon</b>	<b>Discount rate</b>
0-10 years	3 %
10-30 years	2 %
30-75 years	1 %
> 75 years	0.5%



# Recommendations for EA in the initial NAP update steps

---

- Start preparations early
- Identify all relevant sources of information
- Know (agree upon) what role will the economic analysis have in the decision making process
- Assess available data and decide on appropriate tools (CEA, CBA or MCA)
- Organise data in the manner that will allow consequent steps in the analysis
- Identify any areas where new assessments/ data collection is necessary
- Focus on key pressures and impacts
- When quantification is not possible, use qualitative approaches
- Identify needs for the future



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# UNEP/ MAP Guidance on CEA and CBA – Appendix G of the NAP update *Guidelines*

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## Part 2 – Cost-effectiveness analysis

NAP update meeting

11 – 13 May 2015, Athens



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# Strengths and weaknesses of the concept

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- Requires good knowledge of functional relationships between measures – pressures – impacts/ targets (cause – effect relationship)
- Financial (private/ compliance) and economic/ social costs
- Does not include full range of benefits
- Effectiveness of combination of measures/ how to deal with co-benefits
- A more narrow scope compared to CBA, but on the other hand easier to implement



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# Questions to be answered before deciding to apply CEA

---

- Well defined/ quantified target?
- Established/ known links between proposed measures – reduction of pressures/ effects
- What are the information gaps and can they be overcome in the course of the NAP update?

*Quantitative – semi-quantitative – qualitative?*



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# Practical experiences with CEA

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**REFRESH project:** *Pan-European review of cost-effectiveness analysis studies relating to water quality and WFD compliance challenges*

«*The choice of a particular methodological framework in the CEA highly depends on the specific environmental problem to be dealt with, **the availability and credibility of data, and the degree of uncertainty inherent in cost and effectiveness information.***»

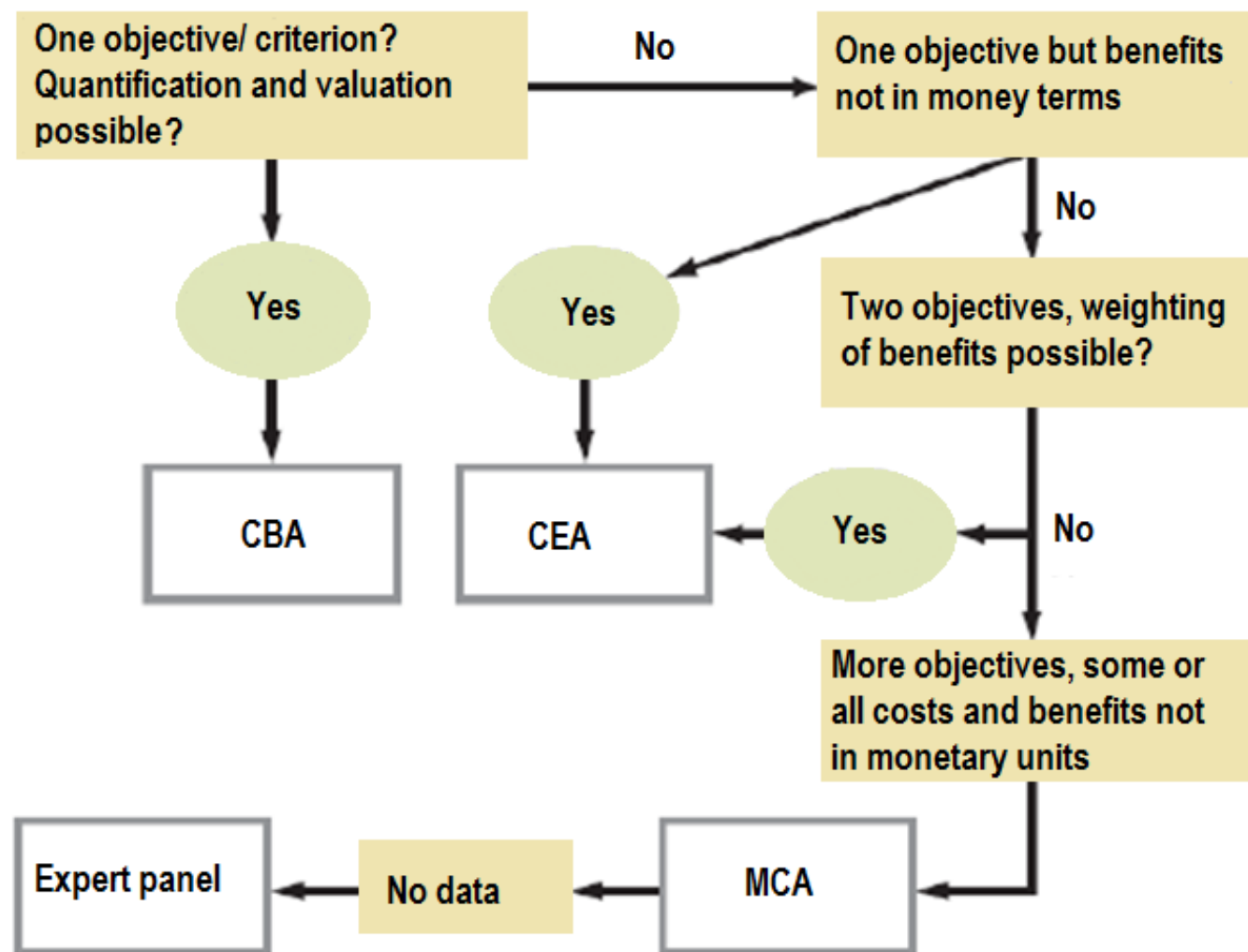
*To deal with this issue, the use of **intervals of costs and effectiveness estimates** as well as sensitivity and scenario analysis is advocated.*



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# REFRESH study (Pan-European review)



# Cost-effectiveness analysis: steps for quantitative assessment

---

## Environmental objective?

## Alternative measures (sets of) to achieve it?

1. Assess the effectiveness of identified measures in reaching the environmental objective;
2. Assess the costs of these measures;
3. Rank measures in terms of increasing unit costs;
4. Establish the least cost way to reach the environmental objective/ target.



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# Example of quantified CEA - Swedish nutrient reduction policy

**Sweden:** cost-effectiveness of the past (1995-2005) and current nutrient reduction policy

	National “zero eutrophication” target	BSAP* target for Sweden
Nitrogen load	- 16,890 t by 2010 (compared to 1995)	- 20,948 t
Phosphorus load	- 350 t by 2010 (compared to 1995)	- 291 t

\* Baltic Sea Action Plan

What was done:

- Past and current policy measures identified
  - [current: focus on increased cleaning at WWTPs, P-free detergents, reduction in cattle, pigs and poultry, fertilizer reduction, catch crops, creation of wetlands, etc.]



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# Example of quantified CEA – nutrient reduction policy Sweden

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## Costs estimated (and linked to effects)

- 1995-2005: total costs of measures € 336 mil; achieved nutrient reduction – 15,474 t of N, 527 t of P
  - total cost of current national policy € 299 mil; cost of meeting BSAP target € 585 mil
- 
- Results of the assessment:
    - Highlights the sectors with potential for cost-effective solutions (agriculture)
    - Highlights types of measures with highest contribution to meeting the targets in a cost-effective manner
      - e.g. bulk of the funding (139 out of € 196 mil for agricultural measures) to implement measures that reduce both N and P simultaneously

Source: REFRESH study



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# Examples from the EU MSFD implementation (semi-quantitative, qualitative)

Source: Arcadis *Background document* – overview of practices  
Scoring system

- Assess expected reduction of different pressures for each measure and relation/ importance of each pressure for each individual target (and indicator) – L, M, H, VH
- Multiply expected reduction in pressure with importance of a pressure - on-site effect
- Score pressures according to geographic dimension
- Multiply on-site and scale for the overall effectiveness of measures (categories 1 – 5)
- Compare with costs (categories 1 – 5) in a matrix form

		Effectiveness				
		5	4	3	2	1
Cost	1	3	3	2	1	1
	2	3	3	3	2	1
	3	4	4	3	2	2
	4	5	4	3	3	3
	5	5	5	4	3	3

The approach useful to overcome knowledge gaps on driver-effect-pressure relations

# Examples from the EU MSFD implementation (semi-quantitative, qualitative)

---

Source: *Arcadis Background* document – overview of practices

<b>Environmental effectiveness</b>	<b>Implementation costs</b> <i>(ranges to be defined)</i>
Strong	Low
Potentially strong	Moderate
Uncertain	High
<b>Four levels of cost-effectiveness</b>	
Cost-effective measures	
Moderate cost-effective measures	
Low cost-effective measures	
Non cost-effective measure	

# Introduction to group work/ exercises

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Explain hand-out materials:

- 1) List of pre-defined measures (linked to training exercise) for 2 groups
- 2) Methodology (assessment matrix) how to apply CEA

Groups will be invited to:

- 1) Review pre-defined list of measures and amend/ change them as appropriate, having in mind results of the day 1 training
- 2) Apply proposed methodology, identify possible issues
- 3) Prepare brief summary of the exercise for plenary session



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# UNEP/ MAP Guidance on CEA and CBA – Appendix G of the NAP update *Guidelines*

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## Part 3 – Cost-benefit analysis

NAP update meeting

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# Strengths and weaknesses

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- Can provide a very useful and reliable input for decision-making system, when carried out fully and impartially
- Translating all the costs and benefits of a project, policy option or measure/ management scenario into monetary terms can be impractical or it may not give useful results - valuation of non-priced goods and services demanding and challenging
- Possible pitfalls linked to discounting
- CBA only provides an aid to decision making: option providing highest benefit per unit cost may not be the most appropriate on other grounds



# WG ESA, analysis of experiences in EU MSs

---

## Role of CBA in the decision making process

How was CBA used	Number of MS (multiple answers)
To illustrate relevant trade-offs and support decision making	8
To narrow down and fine-tune possible measures	8
To inform policy makers and the wider public	5
To create support among stakeholders	3
CBA not started yet	10



# Questions to be answered before deciding to apply CBA

---

- Are alternative options to be assessed well defined and comparable?
- Is the necessary information on costs and benefits available?
- What is value added from carrying out CBA? Does it justify the time and effort needed?

*Quantitative – semi-quantitative – qualitative?*



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# Cost-benefit analysis: steps for quantitative analysis

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1. Definition of the details of each measure/ set of measures/ policy option subject to the analysis (including 'do nothing' i.e. projection of trends in pressures and impacts without analysed intervention/s)
2. Determining the spatial and temporal scales of the analysis (i.e. over what population is it appropriate to sum the costs and benefits and over what time period do the costs and benefits arise?)
3. Identify all costs and benefits (monetary values)
4. Calculate 'present' values (choose/ apply discount rate)
5. Compare the economic efficiency of various options through comparison of their benefit-cost ratios or net present values



# Example of CBA: Plan Bleu's study

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*Economic study of the impacts of marine and coastal protected areas in the Mediterranean* (Mangos A., Claudot M.-A. (2013))

[http://planbleu.org/sites/default/files/publications/cahier\\_13\\_amp\\_en\\_0.pdf](http://planbleu.org/sites/default/files/publications/cahier_13_amp_en_0.pdf)

- Application of the CBA on various MCPAs
  - Cap de Creus Natural Park (Spain)
  - Sensitive Area of the Kuriat Islands (Tunisia)
  - Specially Protected Area of Kas Kekova (Turkey)
  - National Marine Park of Zakynthos (Greece)
  - Mount Chenoua and Kouali Coves protection project (Algeria)
- Quantitative assessment possible for a ‘...fraction of benefits stemming from the ecosystems and protective actions...’
- 3 scenarios 2010 – 2030: BaU, increasing, and decreasing protection



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# Example of CBA: Plan Bleu's study (selected) results

		Kuriat islands (Tunisia)			Cap de Creus (Spain)		
		S1	S2	S3	S1	S2	S3
Present value of benefits	Commercial fishing	30,915	32,312	29,953	6,785	6,547	5,406
	Recreational fishing	2,334	503	2,614	7,584	8,338	7,259
	Tourism	14,020	15,519	15,182	2,989,260	3,477,665	2,755,540
	Scuba diving	440	460	446	27,387	30,050	24,180
	Boat day trip	NA	NA	NA	NA	NA	NA
	CO2 sequestration	2,809	2,913	2,600	11,878	11,977	11,739
	<b>Total</b>	<b>50,517</b>	<b>51,707</b>	<b>50,794</b>	<b>3,042,893</b>	<b>3,534,576</b>	<b>2,804,126</b>
Present value of costs	Administrartion budget	164	283	27	26,316	64,675	22,699
	Surveillance expenses	-	193	-	2,074	1,171	1,597
	Environmental education	0	249	0	NA	NA	NA
	Expenses of a partner (NGO...)	NA	NA	NA	NA	NA	NA
	<b>Total</b>	<b>164</b>	<b>726</b>	<b>27</b>	<b>28,391</b>	<b>65,846</b>	<b>24,296</b>
	<b>Net present value</b>	<b>50,353</b>	<b>50,981</b>	<b>50,767</b>	<b>3,014,502</b>	<b>3,468,730</b>	<b>2,779,830</b>

# Examples from the EU MSFD implementation – UK approach

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[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/82627/msfd-consultfinal-ia-20121220.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82627/msfd-consultfinal-ia-20121220.pdf)

- For the IA, a range of illustrative management measures (to reach GES targets) has been chosen by experts and policy makers
- Wherever possible, costs and benefits have been monetised; otherwise – qualitative description
- The plan was to subject final measures for achieving GES to a full cost-benefit analysis

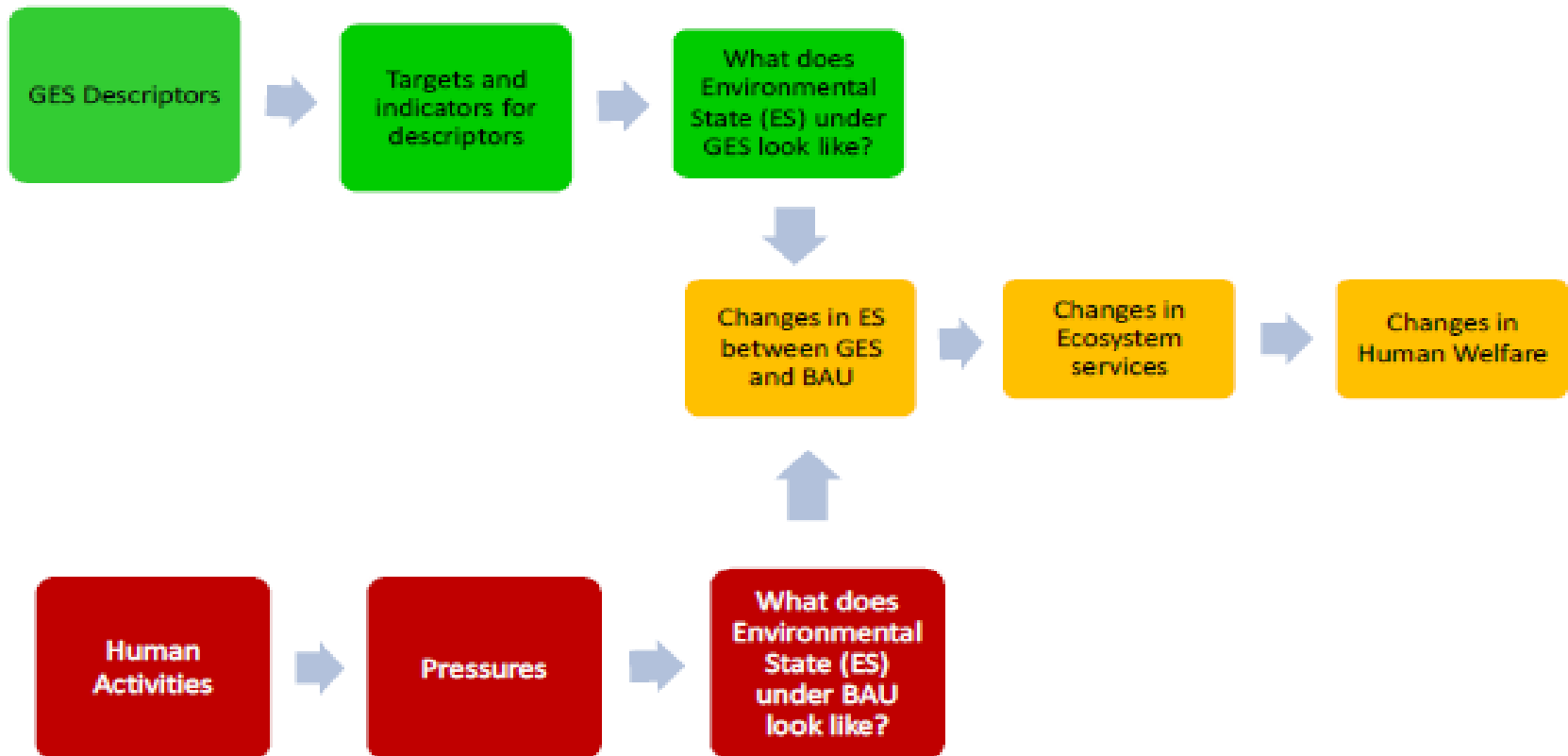


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# Examples from the EU MSFD implementation – UK approach

Summary of the approach to assessing costs of degradation and benefits of achieving GES



# Examples from the EU MSFD implementation – UK

Descriptor	PV costs over 10 years	Qualitative description of costs
D 5 – Eutrophication	Potential costs to business: No additional costs (no new measures over WFD measures).	No un-quantified costs identified.
	Potential costs to government: Additional monitoring costs between 75K and £750K	
	Total potential costs: 75K- 750K over the appraisal period.	
D 10 – marine litter	Potential costs to business: Not possible to estimate, qualitative description	Potential measures: extending codes of practice for the fishing industry, or extending fishing for litter schemes (depending on the impact and effectiveness of existing pilots).
	Costs of additional monitoring for England and Wales are estimated at £412.5K-£938K	
	Total potential costs: £412.5k-£938K over the appraisal period (covers England and Wales only).	





# Introduction to group work/ exercises

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## Explain hand-out materials:

- 1) List of pre-defined measures/ policy options (linked to training exercise) for 2 groups
- 2) Methodological guidance how to apply CBA

## Groups will be invited to:

- 1) Review pre-defined list of measures/ policy options and amend/ change them as appropriate, having in mind results of the day 1 training
- 2) Apply proposed methodology, identify possible issues
- 3) Prepare brief summary of the exercise for plenary session



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# UNEP/ MAP Guidance on CEA and CBA – Appendix G of the NAP update *Guidelines*

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## Part 4 – Multi-criteria analysis

NAP update meeting

11 – 13 May 2015, Athens



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# What is a multi-criteria analysis?

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- Decision support tool
- Used to evaluate different alternatives (e.g. different policy options) according to their performance against a selected set of evaluation criteria
- Applies cost-benefit thinking to cases where it is necessary to deal with impacts that are a mixture of qualitative, quantitative and monetary data and where there are varying degrees of certainty



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# Strengths and weaknesses of the concept

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<b>Strengths</b>	<b>Weaknesses</b>
Enables taking into account impacts that are not easily given monetary values	No built-in standard value, as it applies values (criteria and weights) specific to the evaluated option
Facilitates stakeholder involvement	Comparisons between studies with different valuation criteria and weights are very limited
Makes the appraisal and decision-making process more transparent	Requires well developed participation processes and strongly depends on stakeholder willingness to participate.

# When to conduct MCA in NAP update?

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- If monetary data on costs and benefits would be too difficult to obtain
- When conducting CEA/ CBA (quantitative, semi-quantitative, qualitative) will be deemed impracticable
- When additional involvement of stakeholders will be deemed necessary for NAP elaboration and implementation
- To evaluate measures contributing to more than one objective



# MCA steps

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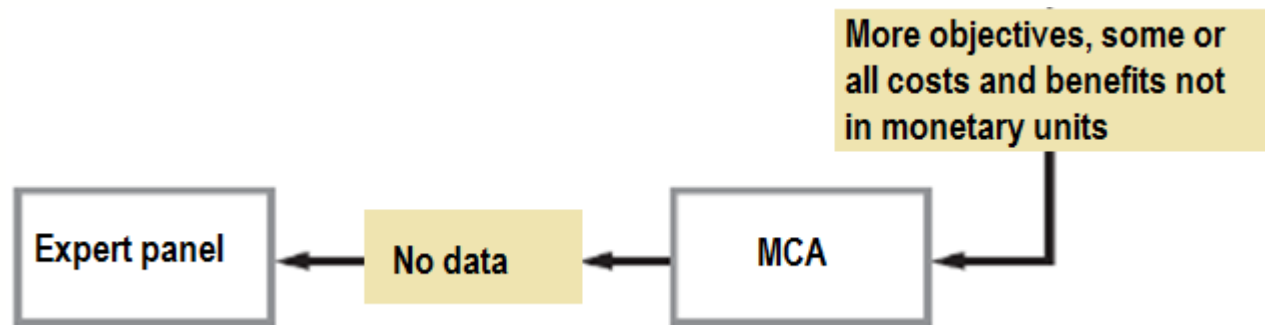
1. Establish the aims of the MCA, the decision makers and other stakeholders
2. Identify alternatives
3. Define the criteria (and the corresponding objectives) that reflect the relevant consequences of each option
4. Describe the performance of each alternative against the criteria in the performance matrix and determine the score matrix (scoring)
5. Assign weights to each of the criteria to reflect their relative importance (weighting)
6. Combine the weights and scores for each of the options to derive overall values
7. Analyse the results



# Conducting MCA in the NAP update

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Revisiting facts/ requirements important to design MCA



- Measures evaluated on a number of important criteria through prioritisation exercise
- Elements of MCA found in the examples provided for CEA



# How to design MCA in the NAP update

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- What stakeholders to involve? Use NAP institutional set-up?
- How to assess measures? Individual or group scoring?
- Potential categories of criteria
  - Contribution to NAP objective
  - Overall effectiveness
  - Costs
  - Benefits
  - Acceptability to stakeholders
  - Synergy with other policy frameworks



# Introduction to group work/ exercises

---

Explain hand-out materials:

- 1) List of measures developed through the day 1 training exercise
- 2) Methodology (assessment matrix) how to apply MCA

Groups will be invited to:

- 1) Review proposed criteria and weights
- 2) Apply proposed methodology, identify possible issues
- 3) Prepare brief summary of the exercise for plenary session



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# **Economic analysis in the NAP update: approaches to assessing the costs of Regional Plans implementation (UNEP(DEPI)/MED WG.414/4)**

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NAP update meeting

11 – 13 May 2015, Athens



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# Purpose of the document

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- To assist Contracting Parties to identify information needed to estimate the costs of implementing measures necessary to meet the Regional Plans' requirements through the NAP update process
- Ultimate goal: enable estimation of overall costs of implementing the key requirements of the Regional Plans (RPs) on the national level and to allow for further aggregation in the Mediterranean
- Regional Plans analysed
  - BOD from urban waste water
  - BOD from food industries
  - Mercury
  - Marine litter



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# Structure the document

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For each Regional Plan:

## 1. Description:

- Scope of the Plan
- Main objectives
- Key measures
- Estimating the costs of key measures

## 2. Annexes

- Summary of the main requirements (table format)
- Checklists and/ or tables to guide identification of necessary information and cost estimations



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# RP on BOD from WWT

---

## Objective

protect coastal and marine environment and health from the adverse effects of direct and/ or indirect discharges of urban waste water within the hydrological basin of the Mediterranean Sea



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# Key requirements of the RP on BOD from WWT

Key requirements	Responsibilities/ who is affected	Measures including investments
<p>1. Collect and treat UWW for all agglomerations (where &gt; 2,000 inhabitants and/or economic activities are sufficiently concentrated)</p> <p>1. Adopt and implement national ELVs on BOD5 for discharges into recipient waters (as appropriate by 2015 or 2019):</p> <ul style="list-style-type: none"> <li>a. BOD5 ≤ 50 after secondary treatment,</li> <li>b. BOD5 ≤ 200 after primary treatment, while taking into account local conditions</li> </ul>	<p><b>Utilities</b> and/ or <b>public administrations</b> responsible for provision of water/ waste water services in agglomerations with more than 2,000 inhabitants within the hydrological basin of the Mediterranean Sea</p> <p><b>Competent environmental/ water authorities</b> (monitoring, enforcement)</p>	<p>Maintenance, upgrade and/ or construction of WW collection systems (including separation of storm waters)</p> <p>Upgrade, construction and adequate operation of WWTPs</p>



# How to estimate costs?

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## *STEP 1: Determine main cost elements*

- Quantify (in physical units such as km, number of pumping stations, population equivalent – p.e. or similar) collection system maintenance and upgrade needs (incl. as appropriate separation of storm waters)
- Quantify the needs for new constructions of the collecting systems (in km, p.e.);
- Quantify the necessary upgrade of existing WWTPs to reach the requirements of the RP (number and capacity of WWTPs needing upgrade, type of interventions necessary to ensure compliance with ELVs);
- Quantify the need for construction of new WWTPs to reach the requirements of the RP (how many, what capacity, what type of treatment).

---

Note: one population equivalent (p.e.) is defined as the organic biodegradable load having a five-day biochemical oxygen demand (BOD<sub>5</sub>) of 60 g of oxygen per day



# How to estimate costs?

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*STEP 2: Decide on unit costs to be applied*

Based on recent comparable projects or plans, identify realistic unit costs. Express in USD or EUR, or, when possible, in Purchasing Power Parity.

*STEP 3: Aggregate the numbers, estimate the costs*

*Link to the table*

*Level of detail can vary*



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# RP on BOD from food industries

---

## Objective

to prevent pollution and to protect the coastal and marine environment from the adverse effects of discharges of organic load (BOD<sub>5</sub>) from food sectors



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# Key requirements of the RP on BOD from food sector

Key requirements	Responsibilities/ who is affected	Measures including investments
<p>1. Food industries discharging more than 4,000 p.e. shall apply BAT and/or BEP to meet the following requirements:</p> <p>COD &lt; 160 mg/l or TOC &lt; 55 mg/l BOD<sub>5</sub> (or BOD<sub>7</sub>) &lt; 30 mg/l</p> <p>ELVs may be set differently when installation discharges into sewages systems; all ELVs to be reviewed in 2015</p>	<p><b>Food industries</b> discharging more than 4,000 p.e. into water bodies (of the Mediterranean hydrological basin), including:</p> <ul style="list-style-type: none"> <li>• Dairies</li> <li>• Fruit and vegetable processing plants</li> <li>• Breweries</li> <li>• Wineries and distilleries</li> <li>• Fish processing plants</li> <li>• Sugar manufacturing</li> <li>• Vegetable oil processing</li> <li>• Canning and preserving</li> <li>• Meat processing and slaughter houses</li> </ul> <p><b>Competent</b> environmental/ water authorities</p>	<p>Replacement and/ or upgrading of technologies to achieve ELVs</p> <p>Introduction and implementation of BEP</p>

# How to estimate costs?

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- Cost estimations on a 'case by case' basis
- Various measures listed as examples of BAT/ BEP in the RP on BOD from food sector
- Costs of will depend largely on the size of industry, local conditions and specificities
- Sources:
  - implemented projects
  - plans of the industries themselves, certification processes
  - sector-wide surveys, if any

*Link to the table*



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# RP on mercury

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## Objective

to protect the coastal and marine environment and human health from the adverse effects of mercury

## Groups of requirements

1. Prohibiting (certain industrial processes, re-entry into the market, new mercury mines, including re-opening of the closed ones);
2. Phasing out releases of mercury from chlor-alkali plants;
3. Limiting emissions of mercury by adopting and enforcing emission limit values (ELVs);
4. Environmentally sound management (metallic mercury from decommissioned plants, wastes containing mercury, contaminated sites)



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# Key requirements of the RP on mercury (significant for costing)

Key requirements	Responsibilities/ who is affected	Measures including investments
<p><b>A Chlor alkali industry</b></p> <p>1. Cease releases of mercury from the activity of Chlor alkali plants by 2020 at the latest and:</p> <ol style="list-style-type: none"> <li>ensure environmentally sound management of metallic mercury from the decommissioned plants</li> <li>ensure progressive reduction (until cessation) of releases with the view not to exceed 1.0 g per mt of installed chlorine production capacity in each plant (air emissions should not exceed 0.9 g)</li> </ol> <p><b>B Non Chlor alkali industries</b></p> <ol style="list-style-type: none"> <li>ELVs for emissions from non Chlor alkali industries to be adopted: less than 50 µg/ l of effluent by 2015 and less than 5 µg/ l of effluent by 2019</li> <li>ELVs for mercury emissions from incineration plants – less than 0.05 mg/ Nm3 in the waste gas</li> <li>Other sectors – reduce emissions of mercury as appropriate</li> <li>Isolate and contain the mercury containing wastes to avoid potential contamination of air, soil or water</li> <li>Identify contaminated sites (at least the old mines and decommissioned Chlor alkali plants) and implement environmentally sound management</li> </ol>	<p>Chlor alkali industry</p> <p>Non Chlor alkali industries including:</p> <ul style="list-style-type: none"> <li>- chemical industries using Mercury catalysts</li> <li>- batteries industries</li> <li>- non-ferrous metal industry</li> <li>- waste treatment plants</li> <li>- Incineration plants</li> </ul> <p>Other sectors emitting mercury</p> <p>Those responsible for management of mercury containing wastes</p> <p>Those responsible for management of contaminated sites</p>	<p>Upgrading and/ or replacement of technologies or introduction of BEPs in order to comply with:</p> <ul style="list-style-type: none"> <li>• requirement to phase out (by 2020) emissions from chlor alkali industry</li> <li>• ELVs for emissions from non chlor alkali industries by 2015 and 2019</li> </ul> <p>Technologies/ procedures to keep emissions from incineration plants below .05 mg/ Nm3 in the waste gas</p> <p>Identify appropriate measures</p> <p>Interventions to prevent contamination - mercury containing wastes (isolation, containment)</p> <p>Contaminated sites – safety works, remediation</p>

# How to estimate costs

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- Case by case approach depending on
  - existing technological state of the plants,
  - overall environmental performance
  - knowledge of employees
  - production capacity
  - compliance culture, etc.
- Possible sources:
  - sectoral assessments for modernisation/ upgrading of certain industries (if existent)
  - similar projects/ technological improvements implemented





# Example of questions

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## Chemical industries using mercury catalysts

- Are there any individual operational plants (and what are their capacities) in each of the categories listed in the Plan?
- Are current releases of mercury in line with the ELV of 50µg per litre of effluent?
- If not, identify measures (specific technological improvements, installation of new equipment, use of know-how, improvement of management practices etc.) that need to be implemented to comply with 2015 ELV.
- Identify measures that need to be implemented to comply with 2019 ELV (5µg per litre of effluent).
- Assess the costs of implementing necessary measures.



# RP on marine litter

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## Objectives

- Prevent and reduce to the minimum marine litter pollution in the Mediterranean;
- Remove to the extent possible already existent marine litter by using environmentally respectful methods;
- Enhance knowledge on marine litter;
- Bring management of marine litter in the Mediterranean in line with accepted international standards and approaches.



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# Key requirements of the RP on marine litter

## Key requirements

### PREVENTION

#### Land-based sources

1. Implement waste hierarchy in managing urban solid waste
2. Reduce the fraction of plastic packaging through adequate waste reducing/ reusing/ recycling measures
3. Extended Producer Responsibility
4. Sustainable Procurement Policies
5. Voluntary agreements
6. Fiscal and economic instruments
7. Deposits, Return and Restoration System for expandable polystyrene boxes
8. Deposits, Return and Restoration System for beverage packaging
9. Reduce micro-plastic
10. Prevent run-off and riverine inputs of litter (through adequate collection and treatment of waste water)

#### Sea-based sources

1. Charges for the use of port reception facilities or No-Special-Fee system
2. Fishing for Litter
3. Gear marking to indicate ownership” concept and ‘reduced ghost catches concept’
4. Prevent marine littering from dredging activities
5. Close the existing illegal dump sites on land
6. Combat dumping including littering on the beach, illegal sewage disposal in the sea, the coastal zone and rivers



# Key requirements of the RP on marine litter (cnt)

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## REMOVING existing marine litter and its environmentally sound disposal

Remove existing accumulated litter, where it is environmentally sound and cost effective (subject to EIA); priority to specially protected areas, SPAMIs and litter impacting endangered species. Specifically:

- Identify accumulations/ hotspots of marine litter and implementation of national programmes on their regular removal and sound disposal
- National Marine Litter Cleanup Campaigns
- Participate in International Coastal Cleanup Campaigns and Programmes;
- Adopt-a-Beach or similar practices
- Fishing for Litter and ensure adequate collection, sorting, recycling and/or environmentally sound disposal
- Charging for the use of port reception facilities or No-Special-Fee system (when port reception facilities are used for implementing the measures provided for in Article 10).



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# How to assess the costs – marine litter RP

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## STEP 1:

*Decide on the appropriate level of the Plan's implementation on the national level (what is feasible, environmentally sound)*

1. What does waste hierarchy in managing SW entail?
  - Quantified needs for upgrading waste collection and separation
  - Facilities (e.g. separation points, transfer stations, recycling yards) to provide for re-use, recovery, recycling
  - Identification of different disposal options and capacities
2. Waste reducing/ reusing/ recycling measures
  - What specific measures *[do not repeat estimation]*
3. Extended Producer Responsibility
4. Fiscal and economic instruments, deposit refunds
5. No special fee system
6. Fishing for litter
7. Clean up campaigns, removal from location XY



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# How to assess the costs – marine litter RP

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## STEP 2:

*Disaggregate measures into actions and further into inputs*

1. Identify actions and inputs needed to implement them (e.g. what equipment for port reception facilities, how many boats in Fishing for Litter scheme/ what incentives, time and equipment needed for removal actions etc.)
2. Decide on unit costs to be used
  - Waste management strategies, policies, plans
  - UNEP/ MAP Background Document on Marine Litter
  - Costs of implemented projects and comparative processes
3. Assess overall costs

*Link to the table*

*Level of detail can vary*



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# Estimation of costs of other measures

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- Monitoring and reporting
  - Number of samples that need to be tested annually and related prices
- Enforcement
  - Inspection and other enforcement staff time and equipment needed to ensure compliance

Monitoring and inspection plans of competent authorities, when they exist, may be used as a source of information for estimating these costs.

Capacity building needs, if estimated that current monitoring and enforcement capacities are insufficient, should be also taken into account.



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## Practical session on cost-effectiveness analysis

Group A

<b>OPERATIONAL TARGET</b>		
Reduce total BOD input by 700 t until 2020 (compared to 2013)		
<b>MEASURES</b>		
<b>Type</b>	<b>Code</b>	<b>Description of measure</b>
Legal		<ul style="list-style-type: none"> <li>• Define GES and adopt necessary marine environment quality standards</li> <li>• Adopt environmental quality standards for bathing water quality (including monitoring requirements)</li> <li>• Regulate use of fertilizers</li> </ul>
Institutional		<ul style="list-style-type: none"> <li>• Institutional strengthening of water utilities</li> <li>• Strengthening of capacities of environmental administration to enforce applicable legislation (monitoring, permitting, inspection)</li> </ul>
Policy		<ul style="list-style-type: none"> <li>• Water tariffs reform</li> <li>• Water savings campaign</li> <li>• Development of guidelines on best environmental practice for aquaculture</li> </ul>
Economic		<ul style="list-style-type: none"> <li>• Assess the existing scheme on water pollution charges, revise as necessary and implement them</li> <li>• Incentives for water savings measures (block tariffs for households and services/ tourism)</li> <li>• Tax alleviations for technological improvements to control product losses and ensure multiple use of cleaning waters for dairies</li> </ul>
Technical		<ul style="list-style-type: none"> <li>• Upgrade of sewage collection systems in towns B and C: replacement of piping 10 km, new construction 25 km, separation storm and urban wastewaters 35 km</li> <li>• Construction of WWTP for town C (50,000 PE)</li> <li>• Upgrade of WWTP for town A to 250,000 PE (secondary treatment)</li> <li>• BAT and BEP implementation for cheese manufacturer (to reduce product losses and ensure adequate pre-treatment)</li> </ul>

## Group B

<b>OPERATIONAL TARGET</b>		
Reduction in quantities of waste for final disposal by 40% until 2025; meeting the requirements of the MLRP		
<b>MEASURES</b>		
<b>Type</b>	<b>Code</b>	<b>Description of measure</b>
Legal		<ul style="list-style-type: none"> <li>• Upgrading regulations on waste categorization and industrial waste management</li> <li>• Regulation on the use of plastic single use (thin) carrier bags</li> </ul>
Institutional		<ul style="list-style-type: none"> <li>• Institutional strengthening of waste management utilities</li> <li>• Strengthening of environmental administration capacities to enforce applicable legislation (monitoring, permitting, inspection)</li> </ul>
Policy		<ul style="list-style-type: none"> <li>• Development of sustainable consumption and production policy</li> <li>• National marine litter management plan (including monitoring programme)</li> <li>• Awareness raising campaigns on recycling and marine litter</li> <li>• Assessment of options to introduce Deposits, Return and Restoration System (DRRS) for expandable polysterene boxes (EPB) in the fishing sector</li> </ul>
Economic		<ul style="list-style-type: none"> <li>• Voluntary agreement on deposit refund system for beverage containers</li> <li>• Interest free loans for development of recycling capacities</li> </ul>
Technical		<ul style="list-style-type: none"> <li>• Closure and remediation of the 2 existing dumpsites (priority locations that allow easy spread of waste to the sea)</li> <li>• Upgrade of waste separation and collections systems (containers, vehicles) in towns A, B and C</li> <li>• Recycling yards and stations in towns A and C</li> <li>• Construction of a regional landfill for municipal solid waste (towns B, C, D)</li> <li>• Construction of appropriate industrial waste disposal facility</li> <li>• Beach cleanup campaigns</li> <li>• Setting up of 'Fishing for Litter' scheme, including provisions for reuse/ recycling and/ or safe disposal of collected litter</li> <li>• Removal of accumulated marine litter from the vicinity of SPAMI site</li> </ul>



## Practical session on cost-benefit analysis

### OBJECTIVE: Elimination of hot spots in river basins I and II by 2025

#### DESCRIPTION:

##### Expected trends for the main economic activities:

- Average population growth 2% annually by 2025
- Agriculture and fisheries remain on approximately the same level in terms of production/ catches; employment in agriculture falls by 5 percentage points
- Doubling of aquaculture production by 2025
- Increase in number of tourists at a rate of 5% annually in the short run
- Steady increase in cheese production, average annually growth rate 5%

<b>Slow protection (Scenario 1)</b>	<b>Increased protection (Scenario 2)</b>	<b>Strong protection (Scenario 3)</b>
Slow progress with urban wastewater collection and treatment	Moderate progress with urban WWTP	Upgrading sewage collection system, WWTPs for all agglomerations above 2,000
Slow progress with MSW reduction at source and environmentally sound waste; closure and remediation of priority waste dumps	Moderate progress with waste prevention, reuse, recycling and recovery; closure and remediation of priority waste dumps	Strong progress with waste prevention, reuse, recycling and recovery; removal of accumulated litter. Full compliance with MLRP requirements
Food industry continues to expand, slow uptake of environmental protections measures	Food industry applies BAT and BEP, no pretreatment	Food industry fully applies BAT and BEP; pretreatment plant in operation
Production capacity increases to 70,000 t of chlorine; no decommissioning	Decommissioning of existing chloralcali plant by 2025 (change to a new technology)	Remediation of mercury contaminated site; Closure of

**TASK: Use the assessment table to identify and describe (in quantitative or qualitative terms) direct and indirect benefits and costs of the following technical measures**

<b>Slow protection (Scenario 1)</b>	<b>Increased protection (Scenario 2)</b>	<b>Strong protection (Scenario 3)</b>
Upgrade of urban WW collection systems in all towns and project documentation for WWTP	Upgrade of urban WW collection system and WWTP for towns B and C (50,000 PE)	Upgrade of urban WW collection system and appropriate WWTPs for towns A, B and C (150,000 PE)
Closure and rehabilitation of open dump and construction of a sanitary landfill	Closure and rehabilitation of open dump and construction of a sanitary landfill  Improve SW collection and transport systems	Closure and rehabilitation of open dump and construction of a sanitary landfill  Improve SW collection, separation and transport; implement recycling schemes to reduce landfilling of plastic waste by 20%
Current environmental performance of cheese manufacturer continues	BAT and BEP for cheese manufacturer by 2016	Pretreatment for WW from cheese production by 2020
Chloralcali plant increases production and continues to operate with current technology	Decommissioning of the current production process in chloralcali plant (shift to a new technology)	Remediation of mercury contaminated site  Closure of chloralalkali plant in 2025
Industrial waste landfill in operation as of 2023	Industrial waste landfill in operation as of 2018	Industrial waste landfill in operation as of 2018; remediation of municipal landfill receiving industrial wastes until 2018

ID numbers (aggregated measures)	Description of measures	Evaluation criteria (1 – 5)						
		Contribution to objective	Overall effectiveness	Costs	Benefits	Acceptability	Synergy	Total score
EO5/W1/M1 EO5/W2/M1	Set and adopt ELV for BOD (stricter value), nutrients and mercury							
EO9/I2/M1 EO9/I1/M10	Set up or adjust the ELV and EQS framework regarding mercury.							
EO10/S2/M4	Review and update existing legal framework on marine litter							
EO10/S3/M3	Legislation regarding packaging recycling							
EO9/I1/M2	Adopt legislation on decommissioning mercury plant							
EO5/W1/M2	Regulate economic mechanism to legislation							
EO5/W1/M3	Strengthen legal department							
EO5/W2/M3 EO9/I2/M4	Consultations with industries and voluntary agreements including implementation of environmental performance certificates							
EO10/S2/M6 EO10/S4/M3 EO9/I3/M1 EO9/I3/M2	Design and implement the institutional and financial set-up of an efficient enforcement system (monitoring, inspection...) including marine litter and mercury and develop related indicators							
EO9/I3/M3	Define communication/data portal, accessibility to data etc.							
EO10/S1/M2 EO10/S3/M2 EO5/W1/M7	Public awareness campaigns to promote waste minimization at the source, agriculture pollution sources and promote organic farming							
EO10/S4/M4 EO5/W2/M2 EO9/I2/M2 EO9/I3/M4	Provide technical assistance and BAT/BEP to food sector and mercury industries and conduct capacity building for landfill worker and on standard methods for monitoring							
EO5/W2/M4	Implement water pollution charges							
EO10/S4/M1	Upgrade program for landfills							
EO5/W1/M4	Provide funding sources for upgrading facilities (loans, etc.)							
EO5/W1/M5	Implement fines and incentives to decrease pollution							

EO5/W2/M5	Provide subsidies and tax breaks for industries reducing pollution loads							
EO10/S2/M3 EO10/S3/M1	Put a differentiated tax (or ban) on consumption of plastic products including plastic bags usage (single use)							
EO5/W1/M6	Construct or upgrade WWTP taking into account the population growth and proper ELV							
EO5/W2/M6	Ensure pretreatment of wastewater from cheese manufacture							
EO10/S1/M1	Closure and rehabilitation of open dump							
EO10/S2/M5	Improve solid waste collection and transport systems							
EO10/S3/M4	Expanded recycling schemes							
EO10/S4/M2	Construction of a sanitary landfill and covering and fencing existing landfill							
EO9/I1/M1 EO9/I1/M8	Feasibility study whether to close chloralkali plant or change technology							
EO9/I1/M3 EO9/I1/M5	Develop a decommission plan and related socioeconomic aspects including environmentally sound management, compliance, enforcement (as needed)							
EO9/I1/M4	Adopt BAT to reduce total releases of Mercury, to bridge gap before change of technology/closure							
EO9/I1/M6	Prefeasibility study on how to dispose hazardous waste in environmental sound manner							
EO9/I1/M7	Survey/assessment (audit) on the areas of the chloralkali plant							
EO9/I1/M9 EO9/I4/M3	Project development in collaboration with Investment donors							
EO9/I2/M3	Baseline assessment for the definition of ELV and EQS							
EO9/I4/M1	Survey/assessment (audit) on the status of the hotspot							
EO9/I4/M2	Prefeasibility study for hotspot elimination							