Synthesis report on the AMP experimentations. Lessons learned, recommendations and perspectives

Deliverable D6.16

This deliverable is to be referenced as follows:

Kontogianni A., Skourtos M., Garmendia M., Le Tellier J., Breil M., Sauzade D., Morla D. M., Shivarov A., Gileva E., Boteler B., Kruger I., Roeleveld G., Hommes S., Tourkolias C., Damigos D., Furlan E., Beaumont N., Koulouvaris E., Pascual M., (2015). *Synthesis report on the AMP Toolbox experimentation in the Mediterranean and the Black Sea. Lessons learned, recommendations and perspectives.* **PERSEUS Project**

ISBN no:

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PERSEUS Deliverable Nr. 6.16

Project Full title	Policy-oriented marine Environmental Research in the Southern EUropean Seas
Project Acronym	PERSEUS
Grant Agreement No.	287600
Coordinator	Dr. E. Papathanassiou
Project start date and duration	1st January 2012, 48 months
Project website	www.perseus-net.eu

Deliverable Nr.	6.16	Deliverable Date	28 December 2015
Work Package No		6 - Adaptive Policies and Scenarios	
WP Responsible		Didier Sauzade	
Work Package Task		6.4 –Implementation and lessons learned	
Task /Report Responsible		Areti Kontogianni	
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Status:		Final (F)	F
Dissemination level:		Public (PU)	PU
		Restricted to other program participants (PP)	
		Restricted to a group specified by the consortium (RE)	
		Confidential, only for members of the consortium (CO)	

Contents

Executive summary

To operationalize the design and implementation of marine environmental policies in the Southern European Seas (SES) and translate adaptive management into decision tools under the requirements of the Marine Strategy Framework Directive and Ecosystem Based Management, the Adaptive Marine Policy (AMP) Toolbox has been developed. The objective is to provide policymakers with the necessary framework and resources to develop environmental policies and specifically adaptive policies. Offering technical assistance will enhance the capacity of the decision-makers to fully comply the legal requirements. AMP toolbox is a web-based platform that functions as a structured and documented depository of tools and databases supporting the design, implementation, monitoring, evaluation and adaptation of marine policies.

In order to investigate the usefulness of the AMP Toolbox and improve its functionality, different tests have been performed using real-world problems through a participatory approach with stakeholders. The experimentation of the AMP toolbox refers to the use of the toolbox in a simulated environment with key stakeholders. A common methodological frame was devised for this purpose and applied to the in-depth interviews and workshops. The experimentation phase has been performed at two levels: (i) Pilot case level; and, (ii) Basin level (i.e. including the Mediterranean and Black Sea).

A total of 93 stakeholders were interviewed in 5 case sites, through 13 in-depth interviews, 50 online questionnaires and 21 workshops. The experimentation took place during the period September 2014 to December 2015. The results suggested that AMP is well perceived, rich in useful information and capable of becoming a valuable decision support instrument for policy makers. A synthesis of the lessons learned and the insights gained from the AMP toolbox experimentation lead us to the following key takeaways:

➢ The AMP Toolbox appears able to accommodate the needs of diverse user groups
➢ Scientifically trained users are expected to use the toolbox more efficiently
➢ The trade-off between simplicity of use and coverage of informational needs is hard to overcome.
➢ Communicating to the user the type and degree of uncertainty in specific management issues is problematic.
➢ The AMP Toolbox seems to be reliable in normal use, it is bug free, all the provided links are reliable and the time response of the AMP toolbox is satisfactory
➢ The provision of best practices and examples are highly appreciated by the users

Summarizing, the overall evaluation of the AMP Toolbox can be characterized as positive, while some features of the tool should be further improved in order to increase efficiency and functionality of the tool.

Scope

This is the final deliverable produced within PERSEUS WP6 (Adaptive policies and scenarios), Task 6.4: Implementation and lessons learned. Task 6.4 aims at testing and improving the Adaptive Marine Policy toolbox, which was designed and developed within Task 6.3. It approaches this target by exposing the toolbox to a number of structured tests in order to identify problems in design and functionality, and by improving it through tradeoffs. The research was initiated with Deliverable D6.13 and culminates in the present Deliverable D6.16 homogenizing/summarizing all recommendations and lessons learned from the AMP toolbox development proccess. Deliverable D6.13 presented an analysis of users' experience of the tool, reporting in detail on user's recommendations and lessons learnt. The purpose was improvement of the form and substance of the AMP toolbox. Deliverable D6.16 builds on previous research performed in various subtasks of WP6. Of central importance were results and progress laid down in Deliverables D6.7, D6.9, D6.10, D6.11 and D6.12. Deliverable D6.16 is also closely linked with research results performed for Deliverable D6.14 (Report on the AMP experimentations at SES basin scale) and Deliverable D6.15 (AMP, final report on expectations issued by the SES stakeholder platforms).

Content of the deliverable

This deliverable is organized in 4 chapters and 9 Annexes.

Chapter 1 presents the conceptual background behind the AMP Toolbox design, documenting the need for Adaptive Marine Policies. The reader can find the link between policy and research, (PERSEUS title: **policy** oriented marine **research**) by positioning Work Package 6 (the socioeconomic PERSEUS WP) within the project structure. The corresponding APPENDIX I.1 starts off with the position of WP6 within the context of PERSEUS, its objective and content.

Chapter 2 gives a short description of the AMP Toolbox. It presents its main structure and objectives. The reader can find supportive material explaining thoroughly the AMP Toolbox in the Appendices related to this chapter as follows:
Appendix II.a: Dissemination material for AMP Toolbox
Appendix II.b: AMP Example: Marine Litter in the Mediterranean and Black Sea

In chapter 3 we analyse the basic methodology followed during the AMP experimentation process. Methodological difficulties concerning the experimentation of a web - based Toolbox, an analysis of the procedure and the resulted information are described in this section. The reader can find the full experimentation phase analysed in Appendices related to this chapter as follows:
Appendix III.a: AMP Toolbox experimentation by pilot case
Appendix III.b: AMP Toolbox experimentation on basin scale
Appendix III.c: The web-based AMP evaluation protocol
Appendix III.d: The AMP evaluation survey results
Appendix III.e: AMP workshops presentation material
Appendix III.f: A Roadmap for AMP Toolbox experimentation

Chapter 4 synthesizes the various insights and lessons learned on the basis of the AMP Toolbox experimentation process. General comments and critical points referring to the structure and content of the Toolbox are discussed, taking into account the novelty of the AMP Toolbox in the marine governance domain.

Chapter 5 synthetizes the lessons learned during the development process of the AMP Toolbox in the general perspective of how research results can be transferred to develop ecosystem based environmental policies.

1. The conceptual background to AMP Toolbox

This section gives an overview of the conceptual background to the AMP toolbox. It discusses the idea of adaptive policy and the informational requirements of policy-making for marine ecosystems.

1.1. Managing marine ecosystems is a complex issue

Marine ecosystem's resilience to stress and shock should be known in order to design and implement effective policy measures. Seas though are notoriously dynamic and complex ecosystems. Our knowledge of marine ecosystem complexity and interrelationships is relatively limited. Notwithstanding the progress in the protection of Southern European Seas (SES) - brought about inter alia with the ongoing implementation of the MSFD - there are still many open issues related to the future development of human pressures and the associated impacts on the provision of marine ecosystem services. Not surprisingly, gaps in our scientific understanding are looming large. (Crise et al 2015) As mentioned by Crise et al 2015, there are gaps in both knowledge and data relating to marine and coastal ecosystems of SES and, thus, long-term and large-scale ecological processes are generally poorly understood. Basic data on the past and current extent and status of many marine and coastal ecosystems are not available or are of questionable quality, making accurate calculations of change and trends difficult. In addition, it is argued that existing biodiversity indicators do not adequately reflect many important aspects of biodiversity and food web functioning, and so far, there is no agreement, towards a complete set of indicators. This stands especially for deep-sea research (EMB 2015). For example, there is a lack of understanding of the oceanic nitrogen cycle that makes predicting the impacts of anthropogenic N inputs very difficult. Further, the current approaches with respect to assessment of fisheries have been criticized for looking at target fish populations in isolation from the ecosystem, failing to recognize the risk of sharp population declines.

Parallel to the geophysical and biological complexities, marine ecosystems exhibit two specific institutional characteristics which reinforce the difficult nature of their governance: First, marine waters are often "global commons" open to more or less unrestricted access and unregulated use. This is true for high seas but to a certain extend also for coastal waters. As a consequence, property rights, right to use and extract marine resources and rights to access are all regulated by a complicated and often contradictory network of international, regional and national legal frameworks making the application of Marine Spatial Planning a challenging task. (Policy Research Corporation, 2011) Accordingly, the large proportion of marine space made up of high seas makes it difficult for coastal States to plan, organize and regulate activities that directly affect their territorial seas and coasts. The story is clearly described in Boyes and Elliott (2015). The authors discuss the introduction of the Marine and Coastal Access Actin 2009 in UK, a regulation that presented an opportunity to harmonise marine management by simplifying the complexity in England through a radical restructuring of marine governance. However this is apparently not the case with many overlapping responsibilities still existing. (Fig 1).

Figure 1: Jurisdiction of English marine organisations and coverage of legislation in the marine environment. Source: Boyes and Elliott (2015)

The starting point of marine governance to date is the national legislation whereby the rights of Member States pursuant to the 1982 United Nations Convention on the Law of the Sea (UNCLOS) are defined. More specifically the rights of Member States under international law to claim and assert the maritime zones provided for in UNCLOS (of which the territorial sea, the Exclusive Economic Zone (EEZ) and continental shelf are most relevant to a discussion of MSP) must first be claimed and translated into national law through national legislation. Such legislation typically also confers upon the State the right in general terms to allocate parts of the maritime zone for different uses. [UNCLOS 1982] Within the SES marine governance structure, it is the states that are mainly involved in ocean governance and it is very much a top-down approach with little opportunity for input from stakeholders. In this context, the most effective maritime governance framework is a regional one created by the states through the adoption of a series of regional treaties and initiatives focused on marine environmental protection (including biodiversity and fisheries) and navigation. The combination of these two elements of complexity (an institutional and a geophysical one) gives rise to a situation where policies and activities tend to develop in isolation from each other and without proper coordination among all areas of activity impacting on the sea as well as all local, national, regional and international actors. This comes in addition to other issues essential to good governance - stakeholder participation, transparency of decision-making, and implementation of agreed rules. (Ruckelshaus et al 2008)

1.2. Evidence-based, Adaptive Marine Policies are needed

The epistemic community active in the marine conservation arena is drawn to marine ecosystems' complexity and interconnectedness, its sheer comprehensiveness. Among all scientific data gaps existing today, the largest gap consists in the lack of a proper understanding of marine biological diversity and food web functioning, which is far to be operational and deserves to be considered the backbone of any holistic approach to the management of the marine environment. (Crise et al 2015) In that sense, it is extremely difficult to observe and monitor timely all human activities in the marine space, in spite of the application of satellite technologies and the design of 'smart', real-time observing systems. New observing technologies are promising a better understanding of both natural marine processes as well as exertion of human pressures on marine living resources and minerals. Nevertheless, such devices cannot fully compensate for the sheer size of the marine domain. On the other hand, "evidence demand" from practitioners and policy makers is often cast in general terms, always linked to human welfare impacts and the administrative and political feasibility of conservation measures. This in turn entails an awkward situation where the outstanding complexity of the issue, the fragmentation of the governance system and the lack of awareness and of political will are held responsible for the impasse in marine governance.

Under these circumstances, the burden of supplying scientific evidence vis-à-vis ecosystem complexity and impact uncertainties is enormous. This ecological fact raises difficulties when replicated in the economic and social domains. In substance, the economic and social analysis has no reason by itself to contribute to the achievement of the good environmental status. The turnover of fisheries in a given area, or, with more reason, the dynamism of the sector expressed in value-added, says nothing of the sustainability of the exploited fish stocks. (Beddington et al 2007) However, if it is indicated by nature sciences that stocks are overexploited, it will be useful to know the socio economic background of the fisheries in order to limit this overexploitation by limiting overcapacities, restricting some fishing methods or establishment of fishing restricted areas. In other words, the economic and social analysis is a preliminary step providing a useful context for implementation of programme of measures aiming to solve environmental issues. (Turner et al 2010) It is an evidence to say that programmes of measures can only be implemented in areas by authorities having jurisdictional rights on such area. This explains, if needed, why the MSFD is mend to be undertaken in areas under the MS jurisdiction. As a consequence, data and statistics required to elaborate economic and social assessments are generally collected by authorities in a perspective of management of human activities within a given territory. For example, the European Commission has implemented the NUTS classification (Nomenclature of territorial units for statistics), a hierarchical system for dividing up the economic territory of the EU for the collection, development and harmonisation of EU regional statistics. So, existing economic and social data are generally not based on functional, ecological units, even for marine activities. Not surprisingly, most member-states have poor statistics on

marine activities, beyond the mandatory ones requested by United Nation Statistic Division, only because their collection is expensive and resource demanding.

Evidence-based marine policies under conditions of scientific uncertainty are not a contradiction in terms. Under the premises of MSFD, marine policies need not be static 'recipes' with given goals and fixed tools. Marine policies need to evolve and redefine themselves along the time axis of their implementation and as soon as new evidence gathers. In the face of exacerbating threats to the marine ecosystems, the changing climate conditions and the complexity of the marine ecosystems, resource managers face large-scale and complex challenges that demand new approaches to balance development and conservation goals. One approach that shows considerable promise for addressing these challenges is ***adaptive management***. Adaptive management by now is broadly seen as a natural, intuitive, and potentially effective way to address decision-making in the face of uncertainties. Yet the concept of adaptive management continues to evolve, and its record of success remains limited (Williams and Brown 2014). Adaptive marine governance can be conceptualized as a policy process with three distinct phases: 1) understanding environmental change; 2) using this understanding to inform decision making; and 3) acting on decisions in a manner that sustains resilience of desirable system states. Because of the dynamism that adaptive management entails, it is unlikely to be a smooth process of learning, knowledge sharing, and responding. There are institutional, sociocultural, and political factors, past and present, which influence each phase of both local and state decision-making. New local institutions might emerge that influence learning and knowledge sharing in ways contrary to those expected by stakeholders. Similarly, state decision-making is relatively uninformed by the diverse knowledge systems available in the marine domain despite the rhetoric of participation and stakeholder deliberation. Historical relations and modes of working continue to play a significant role in mediating the potential for adaptive governance in the future. (Schultz et al 2015) One of the pillars of EU environmental strategies, the precautionary principle, can be looked upon as a early institutionalization of adaptive management: in all cases where scientific uncertainties outweighs the expected benefits from flexible policy frameworks conservation targets should be 'frozen' to our present-day understanding of ecosystem functioning. Policies should 'wait' until new scientific tools are becoming mature enough to evaluate the effectiveness and the associated risks of the mitigation actions and measures.

However, the implementation of adaptive policies is not only a need, but also a legal requirement. Actually, several regulations require implementing adaptive (on the basis of the Ecosystem-based approach to management, EBA) policies for managing the marine ecosystems. From a European policy perspective, in 2008 the European Union adopted the Marine Strategy Framework Directive (MSFD). MSFD establishes a framework to develop marine strategies and take necessary measures to achieve or maintain Good Environmental Status for 2020. For this purpose, it proposes a six-yearly management cycle. This means that there are opportunities at regular intervals to review the suitability and effectiveness of different elements of the cycle (i.e determination of Good Environmental Status, the environmental targets and associated indicators, the monitoring programmes and the Programme of Measures)

as well as to adapt to them. In fact, the MSFD states that the determination of Good Environmental Status may have to be adapted over time in view of the dynamic nature of marine ecosystems and their natural variability; and given that the pressures and impacts on them may vary with the evolvement of different patterns of human activity and the impact of climate change. Moreover, the programme of measures may be flexible and adaptive to take into account of scientific and technological developments. Regarding the SES beyond the European waters, it is noteworthy to mention that the Ecosystem approach is an overarching principle for the development of the environmental programs of the two Regional sea conventions in the SES, the Barcelona Convention and the Black Sea Convention.

1.3. The science/policy interface raises problems of its own

To recapitulate: because of large scientific uncertainties and knowledge gaps it is necessary to provide a framework for policy action and to enable this action to be adaptive as well as consistent with the MSFD and additional European legislation and international agreements (Cinnirella et al. 2014). This is particularly important in regions such as the Mediterranean and Black Sea, where the geopolitical and economic disparity hinders a shared action toward achieving environmental goals, including the implementation of the MFSD. Accordingly, transparent decision-making, which is inclusive of stakeholders at all stages and enjoys high levels of cooperation and coordination, is critical to meaningful development and implementation of the EBA.

We are faced here with the well-known problem known as the science/policy interface. Institutionalized dialogue between the epistemic community and decision-makers, the creation and use of stakeholder platforms and the, all too often, appeal to deliberation can not hide the problematic nature of science/policy interface. The dysfunctional interrelations between science and policy are nowadays more than apparent. They start with the delicate process of mapping 'key' stakeholders for inclusion in the science/policy interface, continue with the problematic documentation of established knowledge vis-à-vis competing views where uncertainty prevails, and finally propagate into the choice of desirable future states of the world. There appears to be a disconnect between civil servants / managers in the state sector pursuing solutions under their specific legislative mandates; segments of stakeholders and users having specific social/economic interests to protect; and NGOs driven by diverse perspectives on protecting ecosystems and transitioning towards a more sustainable society.

In the context of the PERSEUS project, stakeholders can be defined as individuals, groups or institutions that are concerned with, or have an interest in, the marine resources and their management. They include all those who affect and/or are affected by the policies, decisions, and actions regarding marine ecosystems, including public sector agencies, private sector organizations, NGOs, and external agencies such as donors. However, following the PERSEUS DoW and its Strategy of communication, the priority target groups were the following: (i) Policy & decision-makers, politicians and local authorities; (ii) Scientists and the wider scientific community; (iii) Key influencers / multipliers of information. General Public is

excluded because it is not the "group" that most influence decision-taking at least in short-term.

Since policies addressing marine stressors will cost a lot of money over the next 20-30 years to the European taxpayer these issues have to be addressed and our citizens have to decide how much they are willing to invest to resolve these. Coming up with a holistic solution to these multiple, but inter-related problems will be very challenging, since the potential options have a variety of social, economic and environmental implications for the public. Even though many planners, regulators, managers and NGOs realize that the environment and the economy are fundamentally co-evolving, many policy makers struggle to make ends meet economically as costs increase faster than incomes. The wider public needs to be engaged in the modeling and policy dialog and not just leave it up to policy professionals. Getting people to cover the public and private costs of these investments is the critical point by which the success of public marine policies will be judged.

Increasing awareness of the problematic state of international institutions fostering science/policy interface have triggered a whole range of reflections on how to improve the underlying processes. (Welpa et al 2006; Engels 2005; van den Hove 2007) In this context, "speaking truth to power" means not a unilateral communication of 'facts' to decision makers but also the willingness of scientific community to be informed on the policy relevant 'values' underpinning desirables futures. Neither pure scientific data nor subjective value judgments alone would be appropriate in informing public policy agencies. The question then arises on the accomplishments of PERSEUS research community in its endeavor to provide scientific evidence on marine ecosystem functioning to a partner (i.e. policy-makers) looking after for answers to another sort of question: what is a desirable future of SES's economies and societies?

Tentative answers can be found in the following ideas:

> science and policy communities have very different 'cultures'
> most scientists have few incentives to engage with policy makers, as their career paths usually depend instead on research and scientific publications.
> most policy officials have few incentives and little time to engage with scientists or explore in depth the science base of their work, as policy assessments and decisions are the main areas for their work.

Elaboration of science-policy interfaces has largely moved on from the 'linear model' of transferring knowledge from science to policy. In reality, science-policy interfaces are much more complex, multi-dimensional and unpredictable. Exchange and dialogue is recognized as a social activity where scientific knowledge is just one component of a wider knowledge base and must be credible, legitimate and relevant (European Marine Board, 2013) On another line, the mismatch of science/policy interface might lie with Murray Edelman's concept of "symbolic politics" which now forms the bedrock for understanding political communication. Edelman's approach assumes a doubling of the political reality. He assumes that all political actions and

events are characterized by a division into an instrumental dimension, that is, a principal value - which represents the actual effect of a political action - and an expressive dimension, that is, a dramaturgical symbolic value - which represents the presentation of the action for the public. According to Edelman, political players subconsciously and based on their own roles produce a make-believe political world for the electorate using political symbols and rituals for and by the mass media; this process is increasingly being superimposed upon the principal value of political actions. (Edelman 1964)

1.4. Decision-support tools are needed

Marine ecosystems are complex and the changing character of interactions between human uses and their resultant pressures adds to this complexity. This incomplete knowledge about systemic interactions, as well as the incomplete knowledge about the future development of the interactions between socio-economic pressures and natural system, including climate change, increases the areas where the available knowledge is potentially insufficient for making informed decisions. (Rammel, Stagl, and Wilfing 2007). Despite the lack of precise knowledge, decisions need to be taken in the present. Adaptive and integrated ecosystem-based management approaches, are based on principles of holistic consideration of the ecosystem. They allow the consideration of risks and uncertainties arising from incomplete knowledge about the ecosystem and futures pressures, and enable space for learning from experience and adjusting to new evidence. The precautionary principle, evoked among others by the Marine Strategy, requires action to be taken whenever there are threats of serious or irreversible damage to the environment regardless of a lack of scientific certainty. This means a lack of knowledge shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. Thus policies need to be able to react to new knowledge, unforeseen developments, and unplanned outcomes. Thinking about scientific uncertainty and the pitfalls of science/based interfaces lead us to stress the need for appropriate decision support tools that are in the position to:
a) alleviate a part of the ignorance,
b) inform what adaptive policy is all about and
c) elevate the science / policy communication on a new, more transparent and effective level

Guidance documents and toolboxes are frequently used for supporting the implementation of policies dealing with complex ecosystems and the interactions between social and natural systems that this complexity entails. IMAGINE (Bell and Coudert 2005) for the management of coastal zones, or the Marine Spatial Planning Step-by-Step approach (Ehler and Douvere 2009) are successful examples of such guidance documents. A tool that the New York Department of State (DOS) developed for use in coastal and marine planning is the Geographic Information Gateway (Gateway), an interactive data portal and mapping interface.

Making decisions based on analysis and understanding of marine ecosystems, and the relevant interactions within these systems, can be supported by tools, which assist decision makers in dealing with this complexity. There are two different options for policy support: strongly formalized decision support systems (see for instance Leslie

and McLeod 2007) based on algorithms and/or model based solutions, or toolboxes (i.e. structured collections of single tools which provide input to a greater variety of policy processes). The main difference between the two options lies in their specialization. Strongly formalized tools support decision makers by providing knowledge based inputs and insight into specific issues and can provide powerful long-term modeling with regards to single aspects of the ecosystem. In contrast to this specialization, toolboxes potentially have an advantage in terms of flexibility, versatility and control over inputs (modeling based tools often provoke a "black box" effect, suggesting the "ideal" solution among different policy alternatives). In addition, toolboxes focusing on the design of the policy process can be adapted to a greater range of issues and address different phases of policy making and can provide a better insight and understanding about the issues at stake.

One aim of the PERSEUS project was to provide a policy guidance instrument to policy makers to facilitate the implementation of ecosystem-based management approaches for marine policies: the PERSEUS adaptive marine policy (AMP) toolbox. This toolbox has been developed and tested as part of the PERSEUS project, with the aim of facilitating the implementation of adaptive policies and management schemes aimed at improving environmental quality in the Mediterranean and the Black Sea, and as a result maximizing their capacity to provide ecosystem services to their surrounding populations, while fostering international cooperation with neighboring countries.

2. The Adaptive Marine Policy Toolbox in short

2.1. The context of AMP

Again and again, policy analysts and MSFD commentators stress the numerous challenges that EU Marine Strategy Framework Directive (MSFD) poses to member-states in designing and implementing a successful strategy relating to the protection of territorial waters. [Thiel 2013; Freire-Gibb et al 2014] The challenges are exemplified, but not restricted, to: Operationalizing the concept of Good Ecological Status (GES) and link it to a state-of-the-art observing and monitoring system; quantify and monetize the gap between status-quo and targeted levels of GES; establish permanent fora of stakeholder deliberation; evaluate existing and prospective management measures; devise flexible mechanisms for adaptation to new information and data. Following the logic first introduced with the EU Water Framework Directive, the MSFD requires EU MS to perform an economic and social analysis for describing the economic importance of sectors that impose pressures on, or benefit from, marine ecosystems, and the costs imposed on society by the degradation of these ecosystems. This information is then used for supporting the selection of measures that will cost-effectively contribute to improving the ecological status of marine ecosystems. More precisely, Article 8.1 (c) of MSFD calls for 'an economic and social analysis of the use of those waters and of the cost of degradation of the marine environment'.

PERSEUS embraces the integrative approach of MSFD by linking biophysical research and data relating to the various ecosystem processes, structures, stocks and flows with a solid socio-economic assessment of SES open sea and coastal zones. PERSEUS

integrative research is exemplified in its four Pilot Case (PC) areas: Balearic Sea and Gulf of Lyon; Northern Adriatic Sea; Aegean Sea/Saronikos Gulf and Western Black Sea. This line of research culminates in the design and implementation of an innovative, web-based toolbox (Adaptive Marine Policy Toolbox – AMP) facilitating participatory elaboration of multi-scale management schemes and policies aiming to achieve or maintain the GES in the SES. AMP is mend to assist all individuals (hereafter policy- makers) charged with the design and/or implementation of marine policy measures in SES.

The purpose and usefulness of structured and documented collections of methodological tools and databases (i.e. 'toolboxes') must be seen against the backdrop of the on-going debate on science-policy interface. It is generally acknowledged that the complexity and severity of environmental problems make 'evidence-based policy' the desired norm in many fields and this by itself draws a growing number of scientists into the uneasy realm of policy consulting and advising. (Kontogianni et al 2006). Moreover, a frequent feature is the presence of uncertainties about the environmental system and the way it responds to management interventions. Uncertainties therefore necessitate a strong commitment to inflict flexibility and adaptiveness into modern marine governance. To assist both sides - producers and consumers of scientific knowledge - such 'toolboxes' offer a practical and convenient way to transmit knowhow, data, expertise and experience to people charged with designing and implementing management measures. Toolboxes are designed to provide state agencies staff and key stakeholders with guidance and tools to use in developing, implementing, and monitoring state policies and their associated practices that support an effective and efficient public policy. As state agencies staff engages in efforts to set targets and reach desired goals, information is needed in all phases of the design, implementation, monitoring, evaluating and revising policies and practices. PERSEUS Deliverable D6.7: Report on the conceptual framework for the PERSEUS Adaptive Marine Policy (AMP) Tool Box provides in greater details material on the use of toolboxes in marine policy.

AMP is a *set of tools* intended to assist policy-makers involved in implementing marine policies in matters of:

> ➢ Structuring policy responses

> ➢ Delineating institutions and actors involved

> ➢ Accessing available data and information

> ➢ Becoming aware of alternative policy instruments and their relative merits

> ➢ Designing policy scenarios to visualize alternative outcomes, especially in presence of uncertainties

> ➢ Evaluating alternative outcomes

> ➢ And - when it is required to be adaptive – elaborating policies intrinsically robust to change and learning from the experimented policies

AMP has been designed and developed within Work Package 6, Task 6.3. It is based on a five-step policy cycle where each step is linked to the knowledge base and other

relevant resources. It relies on previous research in WP6, produced by a close collaboration between PERSEUS natural scientists and socio-economists:

➢ Task 6.1 (State of play) providing the basic information on scientific, technical, economic, legal and institutional knowledge necessary to develop the AMP. Thematic data bases developed within this task constitute the Knowledge base associated with the Resource section of the AMP Toolbox. In addition to the seven thematic databases produced by WP6, this section propose to the user useful information to develop policies; information on the main risks of non-achievement of the GES provided by WP1 (open sea) and WP2 (coastal areas); pressures in socioeconomic terms on the marine and coastal ecosystems by the WP1 (open sea) and WP2 (coastal areas); Model results from the WP4.

➢ Task 6.2 (Stakeholder dialogue): As the AMP Tool Box was developed for actual application in the Mediterranean Sea and Black Sea regions, the needs and expectations of stakeholders and decision-makers are of crucial importance. Task 6.2 provided a means for dialogue with stakeholders on the scope and functionalities of the AMP Tool Box.

Results and progress has been laid down in Deliverables D6.7, D6.9, D6.10 and D6.11. AMP is uploaded in a dedicated part of the PERSEUS web site by WP9 experts, Task 9.4 (Targeted communication tools for policy-makers, scientists & environmental organizations). AMP Toolbox will remain uploaded for 2 more years after the project end, i.e. until December 2017.

2.2. Guiding Principles

The policy-cycle proposed by the MSFD has been transformed into an adaptive and flexible policy-making cycle by incorporating key components and mechanisms used within different step-wise frameworks. Particularly two frameworks have been taken into account (Table 1).

Table 1: Principal frameworks employed for the development of the Adaptive Marine Police Toolbox.

Title	Reference
Creating Adaptive Policies: A Guide for Policymaking in an Uncertain World	Swanson and Bhadwal 2009
Adaptive Management: From More Talk to Real Action	Williams and Brown 2014

In the environmental field and based on a large experience of USA parks and natural reserves management, Williams and Brown (2014) propose a detailed framework for adaptive management, based on a two-phase process for both technical and social or institutional learning (Figure 2). In the deliberative or planning phase, the critical components of adaptive decision-making are formulated (i.e. involvement of stakeholders; problem assessment; determination of objectives; identification of

management alternatives; forward-analysis to characterize resource changes based on future environmental conditions and management actions; and, the development of monitoring protocols).
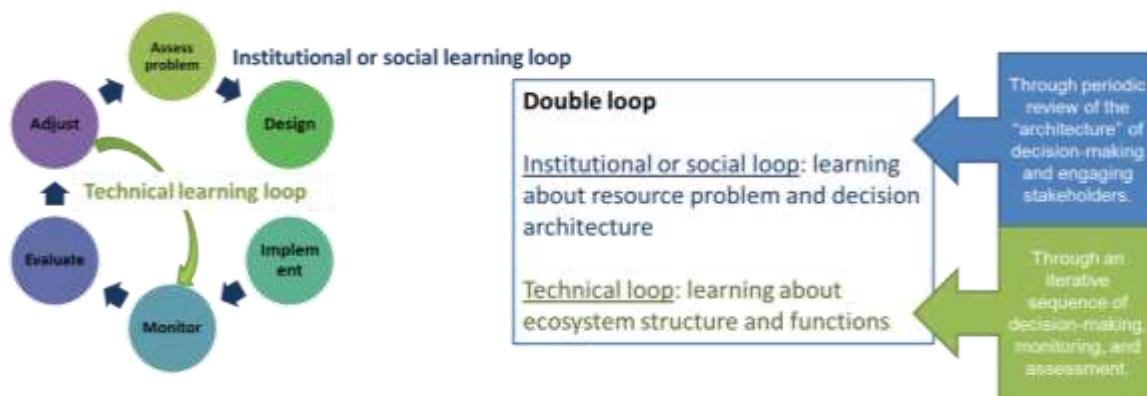

Figure 2: Adaptive management displayed as a cycle, showing technical learning and social/institutional learning. Modified from: Williams and Brown (2014).

Reconsideration of these components constitutes an institutional or social learning cycle where learning about resource problems and decisions architecture is gained.

In the iterative decision phase, the components are linked together in a sequential process of: decision-making – monitoring - assessment. Technical learning is promoted by comparing predictions generated by the models and data-based estimates of actual responses, so that understanding gained from monitoring and assessment can provide knowledge about resource structure and functions for improving future management actions of the resource (Williams and Brown 2014).

Thus, the policy-cycle proposed by the MSFD as well as other examples in the literature, often illustrate adaptive management with a circular diagram that describes a feedback loop beginning with problem formulation and flowing through decision-making, implementation, evaluation and feedback into problem formulation. In the absence of additional structure, such a framework does not distinguish between technical learning and social or institutional learning in a double-loop arrangement (Williams and Brown 2014). By including an additional feedback loop as in Figure 2, both kinds of learning can be represented (Williams and Brown 2014).

BOX 1: THE CASE OF THE TURBOT IN ROMANIA AND BULGARIA

Different commercially exploited fish species in the Black Sea has undergone major changes concerning both its qualitative and quantitative structure and the behavior of various species. One of these species is the Turbot (*Psetta maxima maeotica*).

These changes are consequences of human activities, directly through the fishing pressure; and indirectly through the deterioration of the environmental conditions. In addition, the lack of a Regional Fisheries Management Organization (RFMO) to establish an effective collaborative mechanism for the governance of shared and straddling fish stocks makes exploitation levels of most stocks exceed sustainable levels. Different legislations and conventions require "Populations of commercially exploited fish and shellfish to be within safe biological limits". Accordingly, to accomplish this objective, adaptive policies are necessary (including stakeholders' involvement, science-based information, adaptive tools and methods and monitoring).

BOX 2: A HYPOTETHICAL ADAPTIVE MANAGEMENT STRATEGY FOR THE TURBOT IN ROMANIA AND BULGARIA

The strategy should include the following elements:

Involvement of stakeholders in a committee that should include members Regional Fisheries Management Organization, National fisheries and wildlife agencies, nongovernment organizations, industry and fishermen's groups, and others.

Important objectives such as secure relatively high yields from exploitation of the turbot stock, consistent with the Maximum Sustainable Yield (MSY); and guarantee the stability of the fishery as far as possible, while maintaining a low risk of stock collapse.

Possible management alternatives could range from a full moratorium on fishing, to very high quotas allocation. For example, the harvesting rule could be flexible in order to calculate annually the allowable quotas depending on the monitored spawning biomass. Moreover, control provisions (i.e. special rules concerning fishing permits, vessel monitoring systems, effort, and catch cross-checks) and financial assistance (if the fishery is closed or the biomass level falls below "x" level) should be included in the new management plan.

Models should predict different responses of the stock to fluctuating fishing pressure and environmental conditions.

Finally, monitoring protocols should involve annual spring surveys of the spawning stock as well as of the environmental conditions.

Each year, decision-makers establish the optimal quotas to be allocated based on the spawning biomass monitored annually. In addition, monitoring data are compared with models predictions. Technical learning accumulates by comparing predictions generated by the models and data-based estimates of actual responses. Institutional learning will occur every few years, when stakeholders groups reconvene to re-evaluate objectives and models (and their underlying hypotheses) in accordance with what has learnt during the iterative

Moreover, although policies are explicitly designed to operate within a certain range of conditions, frequently they face with challenges outside that range, making policies ineffective to accomplish their goals. Therefore, in order to help policies help people, policy-makers need ways to design policies that can adapt to a certain range of conditions but also to conditions that are out of the range or that have not been predicted. For this purpose, Swanson and Bhadwal (2009), propose a framework that distinguishes between conditions that policy-makers can and cannot anticipate during policy design and implementation.

On one hand, a policy that is able to adapt to anticipated conditions is built upon a good understanding of cause-and-effect relationships. In practice this can be accomplished through: mechanistic adjustment triggered by a monitoring process; discovering policies that are robust across multiple scenarios or alternative models; and, using multi-stakeholders deliberation in order to understand better the environmental and socio-economic system and improve the effectiveness of the policies (Swanson and Bhadwal 2009) (see Figure 3).

On the other hand, the ability of a policy to unanticipated conditions is based on a holistic appreciation of systems dynamics and complexity. Adaptive policy mechanisms for unanticipated conditions include: enabling self-organization and social networking in order to provide space for flexible action and reducing barriers to collaboration and learning; decentralization of the decision-making as much as is possible, allowing it to respond to local circumstances; promoting variation; and, performing formal policy review and continuous learning (Swanson and Bhadwal 2009)(see Figure 3).
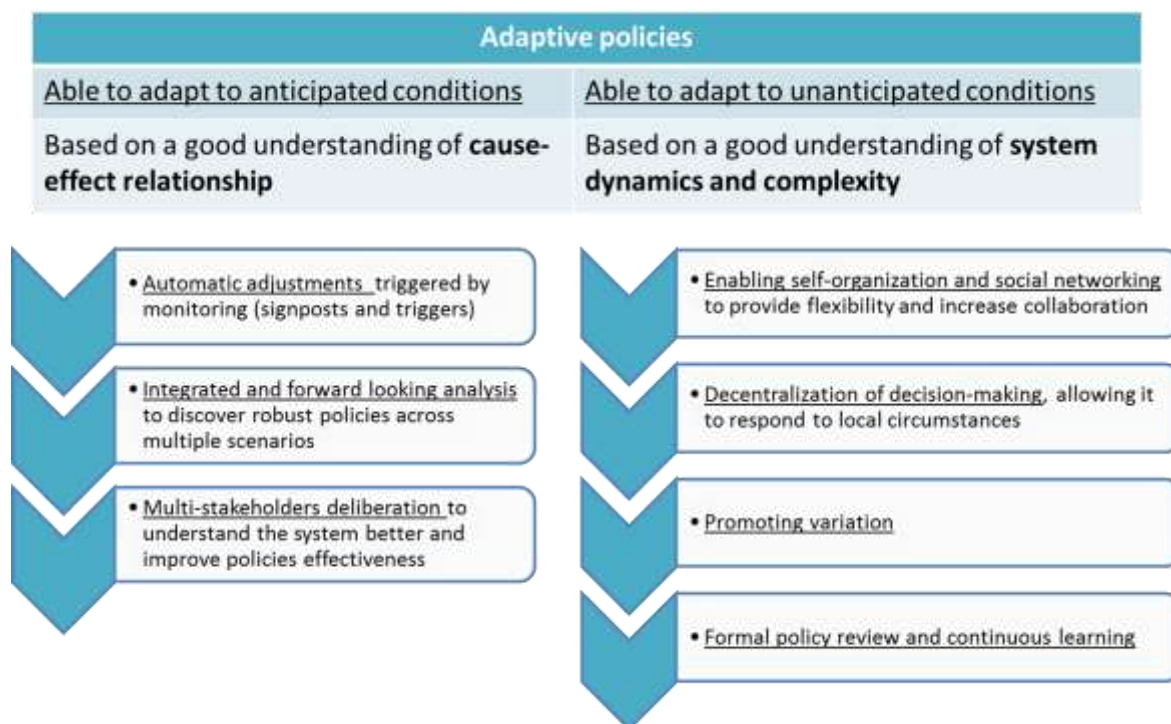

Figure 3: Adaptive policy mechanisms for addressing anticipated and unanticipated conditions. Modified from: Swanson and Bhadwal (2009)

Accordingly, to operationalize the design and implementation of adaptive policies the abovementioned key components and mechanisms have been translated to the AMP Toolbox. To make the translation of these adaptive mechanisms and concepts clearer, the principles that make the AMP toolbox useful to design and implement adaptive policies can be summarized in: (i) a process where cross-disciplinary and integrated scientific knowledge is transferred to decision-makers, including, looking-forward analyses to discover robust policies across different scenarios (i.e. learning contributes to management); (ii) a process where lessons learnt by the use of

management interventions is incorporated (i.e. management contributes to learning); (iii) a process where the broader stakeholder communities are engaged.

2.3. Objective

The overall objective of the AMP Toolbox (http://www.perseus-net.eu/en/about_the_apf_toolbox/index.html) is to provide policy-makers within the Mediterranean and Black Seas with the necessary guidelines and resources to develop adaptive policies or measures to achieve or maintain Good Environmental Status under the requirements of the Marine Strategy Framework Directive. In fact, the AMP Toolbox could be defined as a one-stop repository of guidelines and resources to develop adaptive marine policies in the Mediterranean and Black Seas.

2.4. Structure

For any web-based toolbox a clear and recognizable structure is very important, as it helps users to find their way easily through an abundance of information. Following the model of the United Nations Food and Agriculture Organization´s Ecosystem Approach to Fisheries Toolbox (hereafter, FAO-EAF Toolbox) (http://www.fao.org/fishery/en), the AMP toolbox has been structured in four levels of information (Figure 4).

Figure 4: Four-level structure of the Adaptive Marine Policy Toolbox.

2.4.1. Level 1-Main page

In the first level, the structure of the toolbox is shown, which is based on the policy-making process suggested by the Marine Strategy Framework Directive. Moreover, it is transformed into an adaptive policy-cycle incorporating the principles mentioned above. The toolbox is organized in a policy-cycle containing 5 steps: 1-set the scene; 2-assemble a basic policy; 3-make the policy robust; 4-implement the policy; and, 5-evaluate and adjust the policies. Though, there is no need to follow the whole policy-cycle or the 5 steps. For example, it could be the case where management actions are

already in use but they are ineffective because they do not contemplate future uncertainties or do they do not monitor the effectiveness of the management actions. In these cases steps 3, 4 and 5 can be directly accessed. These steps can be linked from the main page or directly through the main menu (Figure 4).

Figure 5: AMP Toolbox web-page.

2.4.2. Level 2-Steps

All the steps present the same structure, including some basic information such as the objective, requirements and outputs of the step in question. In addition, and most importantly, the key activities necessary to accomplish each step are presented.. Note that the same activity can be addressed within different steps.

2.4.3. Level 3-Key activities

The key activities do not necessarily represent a step-by-step process, but a series of actions to be performed. The 12 activities present the same structure as well, including an introduction, key questions, key actions and links to the resources necessary to develop the activity in question

2.4.4. Level 4-Resources and Examples

The resources comprise: (i) the knowledge base, including 7 databases; (ii) different tools and methods; (iii) the regional assessments and models dedicated to the Mediterranean- and the Black Seas; and, (iv) further readings. Note that a given

resource can be multifunctional o useful for different purposes, thus it can be linked to different activities and steps. The resources can be accessed through each activity, but also directly through the main menu.

Finally within the examples (accessed through the main menu) different real cases where adaptive policies have been implemented, are presented.

2.4.4.1. Knowledge Bases and Regional Assessments and Models

As mentioned above, one of the most important objectives of the AMP Toolbox is to make available scientific data, information and models (particularly those developed within the PERSEUS project) to users and in doing so support policy-making. Accordingly, within the Resources (Figure 4), the "Knowledge base" and the "Regional assessments and models dedicated to marine environmental issues in the Mediterranean- and Black Seas" have been developed from the work performed within the PERSEUS project and gathered in the 'Resources' section of the Toolbox.

The Knowledge base includes information and knowledge that have either been collected or prepared by the PERSEUS project. It has been particularly developed within the Task 6.1- "State of play", which aims to take an initial stock of scientific, technical, economic and legal and institutional knowledge needed to build the AMP Toolbox and construct a knowledge base to manage and make this knowledge available to stakeholders and policy-makers dedicated to the Mediterranean and Black Seas. These inventories and the explanations about their development have resulted in several deliverables (Table 2).

Table 2: Deliverables developed within Task 6.1-"State of play".

Deliverable	Title	Inventory
D6.4	Inventory and critical assessment of existing foresight analyses and scenario planning	-Inventory of research projects -Inventory of Foresight exercises -Inventory of Ecosystem Based Assessment studies
D6.5	Inventory and critical assessment of legal, policy and institutional marine policy contexts in SES	-Legal inventory -Institutional inventory
D6.6	Inventory and critical assessment of the possible measures to be taken to achieve GES	-Measures inventory
D6.8	Inventory and critical assessment of current economic valuation studies on marine ecosystem services	-Marine valuation database

Moreover, to make these results available to the AMP Toolbox users, 7 user-friendly thematic databases (with different research fields) have been developed and incorporated into the web page. Each database has been linked to the different steps as shown in Table 3. Though, the databases are also accessible by a direct link to the Resources.

Table 3: Correspondence PERSEUS Knowledge base with Policy steps.

Database	Steps
Inventory of research projects	1, 2, 3, 4, 5
Inventory of Foresight exercises	1, 3, 5
Inventory of Ecosystem Based Assessment studies	1, 2, 3, 4, 5
Legal inventory	1, 2, 3, 5
Institutional inventory	1, 4, 5
Measures inventory	2, 3
Marine valuation database	2

In addition to the Knowledge base, other resources potentially useful for establishment of programme of measures developed under the PERSEUS project will are available from the AMP Toolbox. These resources have been collected under the "Regional assessments and models Resources" menus, and basically include information and knowledge, such as:

- Analysis of the main risks of non-achievement of the GES in coastal areas and open sea

- Pressures in socioeconomic terms on the marine and coastal ecosystems

- End to end or ecosystem Models developed within PERSEUS and the FP7 OPEC(Marine Ecosystem Forecasting Tools for European Regional Seas) project

These resources have been linked to the different policy steps. However as well as the rest of the resources they also can be accessed through the direct link to the resources.

2.4.4.2. Tools and methods

In contrast to the "Knowledge base" and the "Regional assessments and models", the tools for the "Tools and methods" have been selected from different toolboxes or references already available in the literature or on the web. These sources basically include:

(i)   Monitoring and Evaluation of Spatially Managed Areas (MESMA) toolbox (https://publicwiki.deltares.nl/display/MESMA/Home);

(ii)   Marine Scotland Toolbox (http://www.gov.scot/Resource/0041/00412947.pdf)

(iii)   Food and Agriculture Organization´s Ecosystem Approach to Fisheries (FAO-EAF) Toolbox (http://www.fao.org/fishery/eaf-net/en);

(iv)   Different governmental departments (e.g. Directorate General of Development and Cooperation, EuropeAid) and environmental research groups or companies.

To select the tools a stepwise approach has been followed. Firstly, from the abovementioned sources, an inventory of over-160 tools was constructed. Secondly, from this inventory (i.e. 166 entries), 43 "primarily useful" tools were selected. The

objective of these "primarily useful" tools is to provide examples of useful tools that can be employed to carry out the different activities and steps. To select these 43 tools from the whole inventory (i.e. 166 entries), different "thematic groups" were organized according to people´s fields of expertise (e.g. economic tools, spatial analysis and ecosystem assessment tools, risk assessment tools and stakeholder analysis tools). Once the thematic group were formed, four selection-criteria were agreed among all the groups: (i) availability of the tool (i.e. whether it can be purchased or is available on the web or not); (ii) simplicity of the tool (i.e. whether the tools is applicable to a wide range of issues/situations or not); (iii) applicability by policy-makers; and, (iv) interest (i.e. whether it is of interest to help achieving the goal of a particular step). The tools with the highest scores became part of the 43 "primarily useful" tools.

Table 4: List of 43 "primarily useful tools", including title, theme, reference toolbox and correspondence with Policy steps.

Tools selected	Theme	Reference toolbox	Steps
AHP in ArcGIS	Risk	MESMA	1, 2, 5
AMBI	Ecosystem	AZTI-Tecnalia	3, 5
AQUATOX	Ecosystem	EPA	1, 3, 5
Asset / Objective – Impact / Threat Matrix	Risk	FAO -EAF Toolbox	1, 2, 3, 5
ASSETS	Ecosystem	NOAA	3, 5
BCA Tool Kit for the Hazard Mitigation Assistance program	Economic	BCA Tool Kit	1, 2, 3
Benthic Terrain Modeler	Ecosystem	MESMA	1
Brain Storming	Stakeholder	FAO -EAF Toolbox	1, 3, 4, 5
CLIMSAVE Integrated Assessment Platform	Economic	CLIMSAVE IAP	1, 2, 3
Coastal Adaptation to Sea Level Rise tool	Economic	COAST	1, 2, 3, 5
Communication Templates and Tools	Stakeholder	FAO -EAF Toolbox	1, 4
Community Based or Participatory Monitoring and Evaluation	Stakeholder	FAO -EAF Toolbox	3, 5
Conceptual and Qualitative Modelling	Stakeholder	FAO -EAF Toolbox	1, 2, 3, 5
Conflict management, Negotiation and Consensus Building	Stakeholder	FAO -EAF Toolbox	1, 3, 5
Consensus Workshop Method	Stakeholder	FAO -EAF Toolbox	1, 3, 4, 5
Cost-Effectiveness Analysis	Economic	EuropeAid	3
DPSWR	Ecosystem	MESMA	1, 2, 3, 5
EcoPath	Ecosystem	MESMA	1
Facilitation – on Line Descriptions	Stakeholder	FAO -EAF	1, 3, 5

Tools selected	Theme	Reference toolbox	Steps
		Toolbox	
Fisheries Library in R	Ecosystem	MESMA	1, 3
Focused Conversations	Stakeholder	FAO -EAF Toolbox	1, 3, 5
Habitat Priority Planner	Ecosystem	MESMA	1, 2, 3, 4, 5
Imagine, Systemic analysis, prospective studies, and participatory approaches for coastal zone management	Stakeholder	Plan Bleu	1, 3, 5
Impact Assessments Guidelines	Economic	EC Smart-Regulation	3
Institutional Analysis	Stakeholder	FAO -EAF Toolbox	1, 4
InVEST Toolbox	Ecosystem	MESMA	1, 2
LINK	Ecosystem	MESMA	1, 2, 3
MarineMap	Ecosystem	MESMA	1, 2, 5
MARXAN	Ecosystem	MESMA	1, 2, 3, 5
Multi-Criteria Analysis	Economic	EuropeAid	3
Multi-Criteria Decision Analysis (MCDA) Also Known as Multi-Objective Decision Analysis (MODA)	Economic	FAO -EAF Toolbox	1, 2, 3
Non Formal Risk Categories (Preliminary Hazard Analysis)	Risk	FAO -EAF Toolbox	1
PANDA	Ecosystem	MESMA	1, 2, 3, 5
PERSEUS Presentation Materials	Stakeholder	FAO -EAF Toolbox	1, 2, 3, 4, 5
Qualitative Risk Analysis (consequence X likelihood)	Risk	FAO -EAF Toolbox	1, 2
Quantitative Stock Assessment Methods	Risk	FAO -EAF Toolbox	1, 3, 5
Questionnaires	Stakeholder	FAO -EAF Toolbox	1, 3, 5
SimLab	Risk	MESMA	1, 3, 5
Social and Economic Assessment Methods	Stakeholder	FAO -EAF Toolbox	1, 2, 3, 5
Stakeholder Analysis	Stakeholder	FAO -EAF Toolbox	1, 4
Stakeholder Meetings	Stakeholder	FAO -EAF Toolbox	1, 2, 3, 4, 5
Stakeholder Workshops	Stakeholder	FAO -EAF Toolbox	1, 3, 5

Tools selected	Theme	Reference toolbox	Steps
SWOT (strength, weaknesses, Opportunities and threat) Analysis	Risk	FAO -EAF Toolbox	2, 3, 4, 5

Thirdly, from this list of 43 recommended tools, some of the tools were selected and classified as "flag-tools" based on the four selection-criteria mentioned above and best professional judgment. For each one of these "flag-tools" a detailed and separate tool page is provided. These detailed pages have a uniform tool format, according to the FAO-EAF Toolbox. Thus, each tool pages provides some sections on general information such as: Steps to use in, Purpose, Overview, Tips, Pedigree, Synergy, Source of Information and Appendix. Moreover, some supporting-criteria are provided to assist users selecting the most useful tools for them based on their needs. These supporting-criteria include: (i) the Usage or difficultness to use, (ii) the Cost, (iii) the Capacity needed to use the tool, (iv) Background Requirements, (v) Participation level required to use the tool, and (vi) Time Range needed to apply the tool. Note that a given tool can be multifunctional o useful for different purposes, thus it can be linked to different activities and steps.

Table 5: List of 10 "flag tools" and the description of the 6 supporting-criteria for each one of them. Key: L-Low; M-Moderate; H-High.

Title	Difficultness	Cost	Capacity requirement	Data requirement	Participation requirement	Time requirement
Stakeholder Meetings	L	L-M	L-M	L	M-H	L-M
Stakeholder Workshops	L	L-M	M	L-M	M-H	L-M
Stakeholder Analysis	M	L-M	M	L	M-H	L-M
Imagine	M-H	M	M-H	M-H	H	M-H
Questionnaires	M	L-H	M-H	L	M-H	M-H
Qualitative Risk Analysis	M	L-M	M	L-M	M-H	L
DPSWR Framework	M-H	M-H	M-H	M-H	L-M	M-H
BCA tool kit	M-H	M-H	M-H	M-H	L-M	M-H
COAST model	M-H	M	M	M	H	M
CLIMSAVE IAP model	M-H	M	M	M	H	M

3. The methodology of AMP experimentation

3.1. The rationale of AMP experimentation

Task 6.4 (Implementation and lessons learned) in PERSEUS project was dedicated to testing and improving the AMP Tool Box. The insight gained during this experimentation phase was thoroughly documented and it served to further elaborate and improve the AMP Tool Box. The main objective of Task 6.4 accordingly is to test the AMP at:

- ✓ The Pilot Cases
- ✓ The basin scale
- ✓ coastal zones
- ✓ Open sea

The experimentation mainly focused on elaboration of adaptive policies aiming to overcome situations **at risk of non-achievement of the GES** during the 2020-2030 horizon and was developed using a participative approach involving stakeholders and as far as possible scientists specialized in these kind of risks. From the lessons learned in the Pilot Cases, the framework was finalized so as to ensure its suitability for policy planning at various scales in support of reaching marine GES in the context of the Sustainable Development of the EU riparian countries.

The rationale of testing AMP is to empirically verify its suitability for the elaboration of future programs of measures for marine governance in SES. Moreover, AMP has to verify its *integrated* nature by being able to link to scientific modelling and other scientific resources produced either internally by PERSEUS or in other research projects. The test of AMP should also shed light on how well the transition from one policy step to another facilitates (or necessitates!) a 'chain reaction' between socio-economics and scientific models and tools.

In this chapter we analyse the basic methodology followed during the AMP experimentation process. Methodological difficulties concerning the experimentation of a web - based Toolbox and an analysis of the procedure and the resulted information are described in this section. The reader can find the full experimentation phase analysed in Appendices related to this chapter as follows:

APPENDIX 3A: AMP Experimentations applied on case sites

APPENDIX 3B: AMP Experimentations applied on basin scale

APPENDIX 3C: Web-based protocol for the AMP evaluation

APPENDIX 3D: Survey results for the AMP evaluation through the web-based protocol

APPENDIX 3E: Presentations shown during the various workshops

APPENDIX 3F: A Roadmap for AMP Experimentations

Figure 6: The four pilot case areas where the APF has been tested.

The experimentation process of AMP gave three kinds of information:

a) a **qualitative assessment** in the form of comments and general discussion (described in the Appendix III.a & III.b),

b) a **quantitative assessment** supported by a web-based, structured questionnaire. This functioned as a common protocol on which the AMP Toolbox evaluation was based. The full version of the web-based questionnaire can be found in Appendix III.c of this report. The survey results are reported in the Appendix 3D.

c) **recommendations and suggestions** (further qualitative data) through an open questions session (included also in the evaluation protocol to further encourage participants in providing their comments and suggestions regarding the different components of the AMP Toolbox).

The web-based questionnaire is linked under a PERSEUS website section called FEEDBACK: http://www.perseus-net.eu/en/feedback/index.html

It contains 28 closed format questions trying to evaluate different components of the AMP Toolbox on a Likert five level scale:

AMP **Scope** (11 questions)

AMP **Content** (4 questions)

AMP **User interaction** (8 questions)

AMP **Technical aspects** (4 questions)

AMP **Technical support** (1 question)

These Likert scale based questions helped to assess different respondents' views towards the AMP Toolbox. The respondents' evaluation was based on a scale of five levels (from strong disagreement to strong agreement) regarding the different aspects of AMP.

There are not up to date established control methodologies for assessing decision support tools. Researchers have to rely on similar but more complex procedures for software testing and adapt them to their specific needs. The scientific community of software development and testing has devised a number of testing methodologies. (Mathur 2008) Testing approaches for example can be categorized in: Static vs. dynamic; White-Box vs Black-Box; Specification-based testing; Visual testing; Ad hoc testing; exploratory testing; Grey-box testing. Alternatively, such a methodological synthesis and transfer could be based on tools aiming at testing a website's usability (see for example: http://mashable.com/2011/09/30/website-usability-tools/).

A general framework for setting up software testing is presented in Kinnula and Matini (1989). The role of testing is to determine the functionality of the tool under specific assumptions but cannot identify all problems ('bugs'). Many of these will be identified, isolated and corrected only after the tool/software pass a critical period of public exposure. Faced with this research dilemma we have decided to combine a number of different methodological sources: elements of software testing with guidelines on social experiments and information on qualitative social research tools.

Table 6 provides a summary of the developed methodology for AMP testing.

Table 6:A summary of the methodological approach.

Time frame	Planning horizon
Policy target	AMP Toolbox design to 'fit' user needs, strategic case studies development, Policy/Project design
Analytical unit	Policy makers, Scientists, PERSEUS Advisory Board
Clients	National, Regional, International
Time for assessment	Rapid, Year
Resources needed	AMP e-Platform, multidisciplinary team, design of a feedback protocol (emphasis on user friendly aspects, but also on applicability on behalf of policy makers)
Knowledge	Specialist
Further info	Kinnula T., Matini J. 1989. How to Test and compare CASE Tools Alamprese et al.,2012. Policy to Performance Toolkit. US Department of Education

Links	http://mashable.com/2011/09/30/website-usability-tools/ http://en.wikipedia.org/wiki/Software_testing

3.2. Basic concepts

The full development of the methodology is given in Appendices III.a, III.b, IIIc, here we describe its basic components.

The meaning of the 'test'

By "test" we practically mean *exposing the AMP in a simulated, hypothetical but realistic situation, where an agent is called to address a problem in marine governance using the* AMP *as a support device.* The test is meant to be a preliminary assessment of AMP Toolbox in order to: demonstrate its utility; try out procedures; evaluate its implementation and the results; and make any needed changes or adjustments. The basic concepts of the experimentation are presented below.

'Agent'

By "agent" we mean a member of a regional PERSEUS SH platform having a specific interest in policy making for aspects of marine management in the Pilot Cases. 'Agents' are therefore members of the regional SH platforms active in the AMP Toolbox testing and improvement. Both civil servants working in policy design as well as high-level stakeholders charged with implementing marine policy are considered here representative agents. A representative agent could also be a scientist who often finds himself in the position of a policy consulter and therefore acquires a certain skill as policy advisor. Such policy-involved scientists are an important target group of the AMP testing because they are in the position to provide expert judgement referring to both the form and the substance of the provided tools and databases.

In line with the above argumentation, three factors are important in selecting agents for the purposes of the test:

- The vicinity of agent to a real, decision-making authority
- The extent of agent's prior experience in developing or implementing new tools, practices, etc.
- The willingness and availability of agents to participate in the test

"Hypothetical but realistic situation"

By "hypothetical but realistic situation" we mean a problem *setting* that anticipates a future or addresses a current issue and its solutions. The problem setting can be visualized as a "what if" scenario that describes the problem and its possible solutions (the 'program of measures') in all five steps of the policy cycle. The setting is realistic if it is anchored in a solid knowledge of the local conditions and habits in matters of state intervention and marine management practices.

Simulation

By "simulated" we refer to *setting in motion* the five cycles of AMP by the agent in a deliberative mode to structure the issues and choose response policies. We build them into appropriate MSFD-scenarios and visualize their outcome. We score the performance of policies by suitable indicators: How effective? How efficient? How quick? The simulation (which is practically the test) can take place either in a face-to-face, interview-like setting or in a group fashion. In all cases, stakeholder deliberation is important! Deliberation means that we interact with the agent through observing, asking, noting, correcting, advising, explaining but not biasing the discussion!

3.3. Structure and organization of the test process

Before we embark on the test itself, we need a thorough and careful design of its structure and organization. The following steps are tentative answers to this task:

Step 1: Do your homework!

Before the test begins, the PERSEUS person(s) involved (hereafter: facilitator and relevant team) must be prepared to answer several questions referring to difficulties that pop up during the process. A facilitator must study thoroughly the spirit and technicalities of the AMP Toolbox as presented in the relevant deliverables

Step 2: Select your agent(s)!

A close look at the SH platforms, enriched with information on SH identification (PERSEUS_Stakeholder_Identification_V18_140214) gives us a good idea of who is suitable to participate in the test. Choosing the relevant agency / person is a matter of the following parameters: position in the decision-making unit, interest, scientific skills, availability, easiness of contact, etc. Selecting the agents implies that we invite them to participate by email or phone.

Step 3: Design the test!

The design of the test needs to take into consideration the number and specific attributes of the persons selected. Depending on the number of persons willing to participate, the test can take the form either of face-to-face or group meetings. A combined use of both approaches is possible. It is also possible to arrange 'hybrid' meetings where a mixture of SHs and scientists participate.

General topics that need to be addressed by the facilitator and his team in each PC *before* the test begins are:

1) Possible issues at risk that could be the object of discussion with the agent in both versions: Coastal and open sea.

2) Pros and cons of alternative forms of meetings with the agent(s)

3) Methodological requirements of the chosen form of interaction with agent(s).

Step 4: Implement the test!

In the (individual or group) meetings we intend to expose the AMP Toolbox to the

participants and get a feedback on its usefulness /appropriateness. The AMP Toolbox itself should be in a form suitable to be demonstrated to the potential users, preferably as a web-based platform.

We start by informing the agent(s) about the specific tools available in the AMP Toolbox. Depending on the familiarity of the agent(s) with similar web-based tools, the information phase on the AMP Toolbox functionalities could take up our first meeting (or more!). We then discuss the chosen topic sequentially in a number of meetings according to the approach/methodology chosen. We may devote our first meeting to the first topic of the above list ('understanding the issue') and investigate how AMP helps in dealing with it. The topics to be discussed are of unequal familiarity to the agent(s).

An important characteristic of AMP is policy adaptability. Therefore, the topic on 'Revise results' should be treated with care and discussed again and again. Most decision-makers do not know empirically what 'adaptive policies' look like and how such a state of policy-making can be achieved. It seems logical that in order to adapt, one has to anticipate and adjust to arising issues and lessons learnt: you adapt your targets and/or tools if you feel you are moving in the wrong direction

Step 5: Write down your results

The final output of the test is to improve and adapt the AMP in line with the lessons learned, complete the knowledge database of PERSEUS, and draw conclusions on key successes and limiting factors. User experiences of similar Toolboxes are, however, seldom written down and formalized in order to make them easily accessible for other people. Therefore, well-formed reports on the practical test and evaluation of the AMP Toolbox provides an important way of getting valuable and detailed information from the practical point of view.

The experimentation process of AMP was complemented by an on-line, structured questionnaire, which functioned as an evaluation protocol. The questionnaire was divided in six parts, each one addressing a separate aspect of AMP.

The first part addressed the issue of scope: to whom would AMP be useful? Is its target well defined and clearly explained? Does it contain adequate information? Is it comprehensive? Does it motivate the user to utilize it?

The second part addressed the issue of content: Are all important and policy-relevant issues are covered in a comprehensive manner? Is the information provided is clear, concise and well written? Is the information provided valuable? Is the structure of the tool clear, logical, and understandable to the user?

The third part addresses the issue of user interactions: Is it easy to use the tool's functions? Is the tool categorized and organized in an efficient manner? Is the retrieved information from the searching queries accurate and valuable?

The fourth part addresses the issue of technical aspects: Are all provided links reliable? Is the tool bug free? Is the time response of the tool satisfactory?

The last part addresses the issue of support and the final one prompt the reader to suggest improvements and recommendations.

4. Key takeaways from AMP Toolbox experimentation process

The evaluation of both the qualitative and quantitative aspects of the implemented interviews and workshops converge to a number of suggestions, which provide valuable input for the improvement of the AMP Toolbox. This section gathers and presents in a concise manner the main comments, both general and specific, drawn from the meetings and discussions. It then attempts a synthesis of the findings in order to provide a concise and functional list of amendments to the AMP toolbox.

4.1. Does AMP toolbox align with a priori expectations?

An overall and generic assessment of AMP toolbox is needed in order to evaluate its general fit into the prescribed (see chapter 1) context of modern European marine governance as it is anticipated in the letter and spirit of MSFD. We remind the reader that management of marine ecosystems needs to address the following issues:

- A complex, highly dynamic natural system
- A complex and fast transforming socio-economic system
- An imperative for adaptive, evidence-based policies
- A knotty science/policy interface

The above is mirrored in the Vision statement of the Adaptive Marine Policy Toolbox:
- At the end of the PERSEUS project, the AMP will be recognized and routinely used as a knowledge platform, which, having built bridges between scientific researchers, policy-makers, end-users and stakeholders in general, will help define and assess programs of measures and policies aiming to achieve or maintain the GES of coastal and marine waters at local, national and regional levels in the Mediterranean and Black Sea basins.
- Based on the results of the project and thoroughly tested on pilot cases at various scales with the active participation of stakeholders, the AMP supports the design of policies, using scenarios and the visualization of alternative policy outcomes.
- The overarching goal of the AMP is to facilitate the implementation of adaptive policies and management schemes aimed at improving environmental quality in the Mediterranean and the Black Sea, and as a result maximizing their capacity to provide ecosystem services to their surrounding populations, while fostering international cooperation with neighboring countries

In this general context, the main *a priori* expectations for AMP have been:
- ✓ To be able to accommodate the diversity of stakeholder groups, interests and levels of expertise.
- ✓ To be able to provide flexibility in the choice of inception points and degree of details provided
- ✓ To be able to communicate to the user the type and degree of uncertainty facing the chosen management issue
- ✓ To be comprehensive without been exhaustive in the range of issues covered
- ✓ To guide, illustrate but not prescribe solutions

The AMP Toolbox appears able to accommodate the needs of a diverse user group although, as a matter of fact policy makers and stakeholders with a strong scientific background are expected to be able to use the toolbox more efficiently in comparison with other policy makers. At pilot case level, stakeholder consultations allowed to define and analyze for each country the governance framework in which the MSFD is implemented, as well as stakeholders' prospects and doubts about the MSFD implementation. MSFD created great enthusiasm regarding achievement of the GES but also doubts about the resources that will be committed to meet the objectives (Le Tellier et al 2015).

AMP is considered flexible enough in the choice of inception points and degree of details provided. The toolbox's functions are considered to be relatively easy to use by (almost) half of the respondents. Sources provided in the AMP Toolbox are easily accessible according to the majority of stakeholders. The choice of either going directly to the desired topic or use a structured approach to relevant topics was emphasized. Due to its interactive character, AMP is able to select different pathways for the policy design according to the issues to be tackled, boundary conditions, and preferences, and give advice for the implementation and monitoring process, easing the policy-makers' way without reducing complexity of issues. Generally, the navigational features of the AMP Toolbox were assessed rather positively. A more efficient organization/categorization of the provided material is suggested by a relatively significant percentage of the users.

On the technical side, it is inconclusive whether the AMP toolbox is able to communicate to the user the type and degree of uncertainty facing the chosen management issue. Coping with scientific uncertainty is a rather sophisticated issue. The demand for simplicity leads AMP to focus on scenario development as a most accessible and user-friendly method for addressing uncertainty. In general terms though, the provided information was assessed as valuable. The AMP Toolbox seems to be reliable in normal use, it is bug free, all the provided links are reliable and the time response of the AMP toolbox is satisfactory. The provided *support services* of the AMP Toolbox should be improved, as almost half of the respondents were indecisive concerning easiness/effectiveness to inform the developers about potential technical malfunctions. It is assumed that familiarity with the AMP use and capacity building might improve stakeholders' attitudes towards aspects of functionality and content.

The AMP was considered able to guide the user through the policy steps although the impossibility to introduce specific data caused ambiguity and confusion. Concern was expressed about the underrepresentation of practical examples and the description of best practices. Examples and best practices would enhance understanding by illustrating tools and approaches. In a latter phase, the AMP Toolbox was improved not only with examples related to the implementation of the MSFD, but also with tools which can be used in each phase, such as the Driver-Pressure-State-Welfare-Response framework, benefit-cost and multi-criteria decision analysis. Surprisingly, whereas the AMP team has sought not to prescribe solutions and express its own preferences towards policy options, many users would like to have a clear rating of

tools and approaches in terms of their suitability to address specific problems. But the AMP toolbox does not exhibit such a 'paternalistic' attitude. Following stakeholder consultations and particularly the workshops with members of the PERSEUS Advisory Board it was decided to conceive the toolbox as a support addressing policy-makers and stakeholders' knowledge and information related to the implementation of innovative adaptive policies. Rather than prescribing solutions, the toolbox was defined as web-portal assisting policy-makers in structuring their problems and providing indications on where to find relevant tools and information for problem solving.

Summarizing, the overall evaluation of the AMP Toolbox can be characterized as positive, while some features of the tool should be improved in order to increase efficiency and functionality of the tool.

4.2. General comments/critical points

In spite of the diversified nature of stakeholder deliberations and AMP experimentation process, some general remarks about the AMP toolbox emerge. We present and discuss here primarily the critical points that reflect a rather unintended comparison of AMP with commercial software and decision-support tools.

First, the indication about attractiveness: the AMP Toolbox is often considered to be not very attractive, flexible and convenient for a 'demanding' user. The tool, so this line of argumentation, provides very detailed information resulting in an informational/educational platform rather than an operational or policy-making tool. According to the respondents, a content focused mainly on necessary policies and corresponding methodologies/tools would be more helpful for policy-makers. A step-by-step guide to AMP methodologies and tools would be valuable for the potential users. In any case, the structure of the toolbox should be planned according to the need of the target groups of users taking into consideration their background knowledge and the fields of their interest. To this direction, the front page of the AMP Toolbox should have a header with direct and concise information about the goal of the tool.

Additionally to that remark, it was also pinpointed that the structure of the toolbox is confusing and superfluous, and that it is not necessary to present directly all the relevant information to the main pages of the toolbox. It would be probably more beneficial to the user to have the option to search for more detailed information if needed, rather than presenting extended texts and resources at once. This could be achieved through the use of a 'More information' link, providing to the user the opportunity either reading the whole text or moving to a different page. To this end, a clear and concise structure of the actions, tools and resources should be common to all the implemented steps. A brief introduction should be added and additional information should appear only if required. Wider use of graphics is expected to increase functionality of the toolbox.

In line with feedback by stakeholders, the AMP toolbox has been revised in subsequent phases to take into account the above remarks. This applies to shortening

the texts and providing a 'more information' link, simplifying the structure and improving graphs and aesthetical aspects.

4.2.1. Comments about the structure

The AMP toolbox is structured on the basis of the five steps of the policy cycle for adaptive management. Keeping this in mind, the user has to follow his/her own inclination and priorities by choosing the policy step to initiate his/her search. In spite though of the clarity of the five-step cycle, it was often suggested that the content should be presented in a hierarchical and concise manner. Thus, special attention has been devoted to consolidate the information and provide only the most critical to each step of the toolbox. The synthesis of this information has been performed in relation with the specification of the target group for each kind of information. Finally, the presentation of the provided information has been made more efficient by replacing the existing – lengthy - texts with summary contents using bullets. At the same time, the central parts of the toolbox were separated from the provided background information. This can be beneficial for the users as they can search firstly the background information and then proceed to the design of a policy, the selection of a measure, etc. In this way, users who are experienced (e.g. scientists) can proceed directly to the point, while, all the other users e.g. non-experienced policy makers, could strengthen their knowledge by reading the background information and then proceed with their task.

4.2.2. Comments about the content

A recurrent critical comment during the AMP testing referred to the limited number of concrete examples, including both success and failure stories. It was time and again mentioned that existing examples provide little empirical information on the implementation experience of the policy steps. Indisputably, the toolbox would benefit a lot if representative and concrete examples were added, enhancing in this way its functionality. It was accordingly decided to enrich AMP with four examples showcasing:

a) The meaning of adaptive management in the case of managing anchovy stocks in the Bay of Biscay,

b) The importance of monitoring and evaluation as exemplified in the Great Barrier Reef Marine Park

c) The application of adaptive management for preventing over-exploitation of the Turbot in the Black Sea

d) The importance of dialogues among multi-sectoral stakeholders in managing the pressures of coastal tourism

The four examples have been developed and explained within the context of the MSFD and aim at motivating policy makers to implement correctly the proposed methodological steps. Other areas of documentation where more material was deemed necessary were a) legislation b) indicators for the implementation of the

MSFD c) scientific papers. The revision process of AMP undertook an updating of the 'Resources' section, restructuring and enriching its content.

4.2.3. User interactions and technical aspects

As a matter of fact, support provided by the AMP toolbox to policy makers aims at being as user-friendly as possible but the diversity of users' capabilities and expectations do not allow here a uniform approach. For example, part of the suggested amendments was not possible to follow because of time and resource constraints (e.g. making the website multilingual). Other, less resource intensive amendments were adopted. For instance, the navigation panel and the search mechanisms have been improved.

A final problem was the lack of a contact form for user support or comments. It was noticed early in the process that the user had not alternative to provide a feedback apart from the questionnaire. A FAQ section would facilitate the confrontation of the emerging problems during the utilization of the AMP Toolbox. To the same direction, the addition of a 'support' link would facilitate this procedure and it is also essential to allow people to interact through the development and operation of a forum sending useful information in order to enrich the existing resources of the AMP Toolbox. Due to time and resource constraints user support via an online questionnaire remains up to date the only channel of communicating defects and bugs to the developers.

Below the main comments of the Advisory Board of PERSEUS

Recommendations of the Advisory Board (AB)

"The main worry was that the Toolbox could become too complex and detailed to be suitable and usable for stakeholders, and might also not really meet the stakeholders' needs. The AB thus recommended that the AMP toolbox should be limited to step-by-step guidelines for adaptive policy making, describing each step in detail. Additionally, not only examples related to the implementation of the MSFD should be included, but also examples of tools which can be used in each step. Finally, efforts should step away from the original idea of a web-based inventory of all PERSEUS tools and results, towards further development of the step-by-step approach. The step-by-step approach should be presented in an interactive format based on web applications".

Recommendations of the Black Sea Commission

'AMP seems a very good tool for policy makers to be informed about best practices concerning Adaptive Policies '

'AMP looks like it could work better in established procedures. Some policy making cases are very clear, you only need to go on with AMP Toolbox '

'Does AMP includes a method to assess policy making? Is there enough data? How do you find the relevant coefficients? After all there might be bad politicians, not bad policies.'

'In order to follow the different futures described by the potential of AMP Toolbox there should also be legal and institutional conditions. If you change the rules and institutional structures there might be a contradiction '

'This is just a Toolbox. It depends on the policy maker or planner how to use it. It resembles the way you use a Tool: screw or unscrew something. This Toolbox is meant to facilitate the whole process of policy making '

'We'll inform immediately the Regional Directorate for this Toolbox. We have enough Regulations in our country, now we only need to act! '

'The Resources part of this Toolbox seems to be the best case '

'Policy makers need to understand: what kind of data is needed? Maybe there is a need of a list of things which policy makers need to take into consideration for each problem (e.g. in the case of chemical pollution). '

'On the scope section: AMP Toolbox seems extremely useful for policy makers who want practical information and data bases, but before decision making (e.g. for fisheries) in a multinational decision context, you need to check the legal documents used by different countries. So a decision maker needs more info on legal matters, more clarifications and best examples. '

4.3. Differences in perceptions: scientists and policy makers.

A research question of interest is the identification of a potential consensus or differentiation between the two main, different types of stakeholders, namely policy makers and scientists. To this purpose, we use the results of the questionnaire survey to undertake a comparison of the statistical mean estimates for all the examined aspects of the evaluation. The statistical variance in the estimates indicates the level of conformity in the perceptions between the two groups.

The non-parametric test Wilcoxon-Mann-Whitney was applied in order to identify which answers exhibit the most significant differences between the underlying distributions of the policy makers' scores and the ones of scientists. Our data samples (one for policy-makers, one for scientists) are independent if they come from distinct populations and the samples do not affect each other. Using the Mann-Whitney-Wilcoxon test we can decide whether the population distributions are identical without assuming them to follow the normal distribution. The null hypothesis is that scores emanate from identical populations. When the p-value is less than the 0.05 significance level, we reject the null hypothesis. The results of the Wilcoxon-Mann-

Whitney test are presented in Table 7. According to the obtained results, 11 out of 28 questions appear to have statistically significant differences among the responses of policy makers and scientists. The scores of the policy makers were higher than the corresponding scores of the scientists with the exemption of the Q14.

Table 7: Results of Wilcoxon-Mann-Whitney test for policy makers and scientists.

Questions	z	Prob>|z|	Rank sum
Q7. The tool is effective with the intended target group of general stakeholders including users with different abilities and experiences	2.547	0.0109	Policy makers: 305 Scientists: 556
Q8. The tool is comprehensive	2.313	0.0207	Policy makers:259 Scientists: 561
Q9. The tool performs its intended functions satisfactorily	2.541	0.0110	Policy makers:325.5 Scientists: 577.5
Q10. The tool is attractive and interesting so as to motivate the user to utilize it	2.658	0.0079	Policy makers:258 Scientists: 522
Q11. There are no other similar tools available in this area	2.008	0.0446	Policy makers:234.5 Scientists: 711.5
Q13. The information provided is clear, concise and well-written	2.275	0.0229	Policy makers:335.5 Scientists: 567.5
Q14. The information provided is valuable	-3.176	0.0015	Policy makers:357 Scientists: 589
Q15. The structure of the tool is clear, logical, and understandable to the user	2.613	0.0090	Policy makers:289 Scientists: 614
Q17. The tool has been categorized and organized in an efficient manner	2.570	0.0102	Policy makers:286 Scientists: 617
Q20. The navigational features of the tool are well-constructed	1.728	0.0840	Policy makers:273 Scientists: 547
Q24. The included workable interactive features such as forms and menus can be characterized as satisfactory	2.446	0.0144	Policy makers:127 Scientists: 539

5. Synopsis, conclusions and a look ahead

Management of marine ecosystems is beset with difficulties due to their sheer size, geophysical complexity and institutional intricacy. Adaptive management is needed to cope with expected and unexpected changes in the state of marine ecosystems but policy makers are in general poorly prepared and equipped to address the challenges. To operationalize the design and implementation of adaptive policies and translate adaptive management into decision tools under the requirements of the Marine

Strategy Framework Directive, the Adaptive Marine Policy (AMP) Toolbox has been designed and developed within the PERSEUS project.

The objective of the AMP toolbox is to provide policymakers with the necessary framework and resources to develop environmental policies and specifically adaptive policies. Offering technical assistance will enhance the capacity of the decision-makers to fully comply with the legal requirements of marine governance. AMP toolbox is a web-based platform that functions as a structured and documented depository of tools and databases supporting the design, implementation, monitoring, evaluation and adaptation of marine policies. By doing so, the AMP toolbox aspires at contributing its bit in the general perspective of the improvement of the science/ policy interface (SPI) in the marine field.

In order to investigate the usefulness of the AMP Toolbox and improve its functionality, different tests have been performed using real-world problems through a participatory approach with stakeholders. The experimentation of the AMP toolbox refers to the use of the toolbox in a simulated environment of a specific marine management issue with key stakeholders. A common methodological frame was devised for this purpose and applied to in-depth interviews and workshops. A total of 93 stakeholders were interviewed in 5 case sites, through 13 in-depth interviews, 50 online questionnaires and 21 workshops. The experimentation took   place during the period September 2014 to December 2015.

Referring to the insights gained from the AMP testing an important caveat applies: due to the complexities of the issues discussed it is hard to reach a consensus among the users, pointing to different social, economic and environmental backgrounds in response to environmental stressors. The differing stakeholder perspectives might also lie behind the vigor with which most of the participants in a science/policy dialogue avoid confrontation with hard trade-off constellations. An in-between finding of interest is the identification of a strong differentiation between the two main types of stakeholders, namely policy makers and scientists. Some people, particularly high-level decision makers, would rather see marine management (a) be only about the open sea, not the coastal zone where the people actually live, and (b) be only about immediate decisions right ahead of us, and not about the long-term effects.

In the previous chapter we summarized the general remarks about the AMP toolbox in terms of attractiveness, user interaction, technical aspects, content and structure. At this stage of our experience with the AMP toolbox testing, the results suggest that AMP is well perceived, rich in useful information and capable of becoming a valuable decision support instrument for policy makers. A synthesis of the lessons learned and the insights gained from the AMP toolbox experimentation lead us to the following key takeaways:

➢ The AMP Toolbox appears able to accommodate the needs of diverse user groups
➢ Scientifically trained users are expected to use the toolbox more efficiently
➢ The trade-off between simplicity of use and coverage of informational needs is

hard to overcome.

➢ Communicating to the user the type and degree of uncertainty in specific management issues is problematic.

➢ The AMP Toolbox seems to be reliable in normal use, it is bug free, all the provided links are reliable and the time response of the AMP toolbox is satisfactory

➢ The provision of best practices and examples are highly appreciated by the users

We conclude that Toolboxes in general, and the AMP toolbox specifically, may not be the best way to articulate a science/policy interface. A two way, continuous communication in person between scientists and policy makers is surely the best option - as it was the case with the stakeholder platforms in PERSEUS - but it is undoubtfully the least-cost option. Besides, the AMP Toolbox has the advantage of being available after the end of the project and therefore in the position to continue to provide support to policy makers. It is definitely one of the Perseus project legacies in this domain.

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Appendix I: PERSEUS and WP6 structure

To promote better governance and achieve Good Environmental Status across the Southern European Seas (SES) in line with the MSFD scope, objectives, and process, PERSEUS project (through an innovative combination of natural and socio-economic science) aims to design an effective and resourceful research governance framework, based upon newly collected, sound scientific knowledge. For this purpose, the PERSEUS project is organised around four clusters within which the work is divided into several work packages (WPs) (see Figure 7).
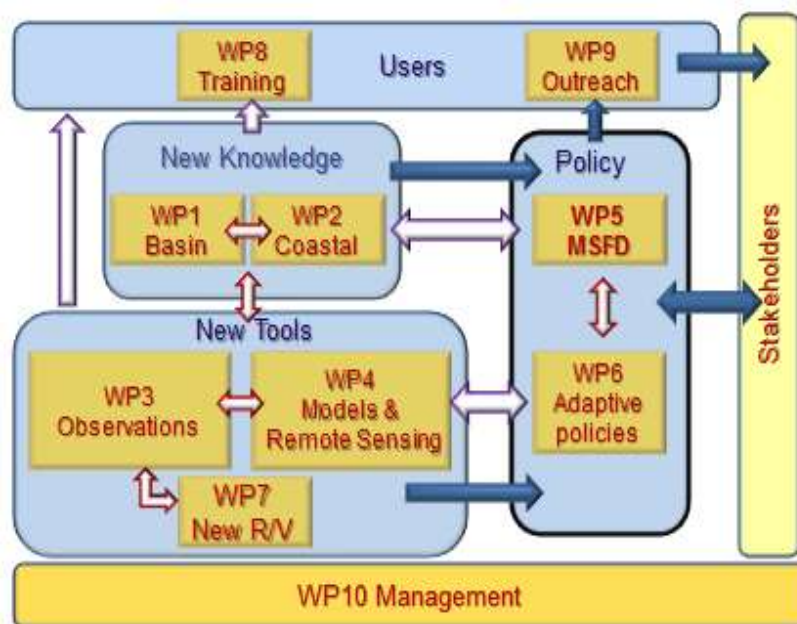
Figure 7: The four clusters of the PERSEUS project

The "Policy" cluster is central within the project since it focuses on the promotion of the MSFD principles and on adaptive policies development. The "Knowledge" and "Tools" clusters are those where the core scientific and technological works are carried out. Finally the "Users" cluster is where the results and capacities developed by the project are shared with stakeholders and decision-makers through both training and outreach activities.

The overall intent of WP6 ("Adaptive policies and scenarios") is to bridge the gaps between scientists and policy-makers, while remaining policy relevant and avoiding prescriptive endeavours. In the framework of WP6, PERSEUS will thus develop, through a participatory approach, an Adaptive Policy Framework (APF), which will assist policy-makers in facilitating and preparing the future implementation of adaptive policies and management schemes in view of a better governance of the human-made pressures in the Mediterranean and the Black Seas. These policies and management schemes will aim to achieve or maintain Good Environmental Status while enabling the sustainable use by present and future generations of marine goods

and services. To develop the APF, the work of WP6 has been organized in four tasks as observed in

Figure **8**.
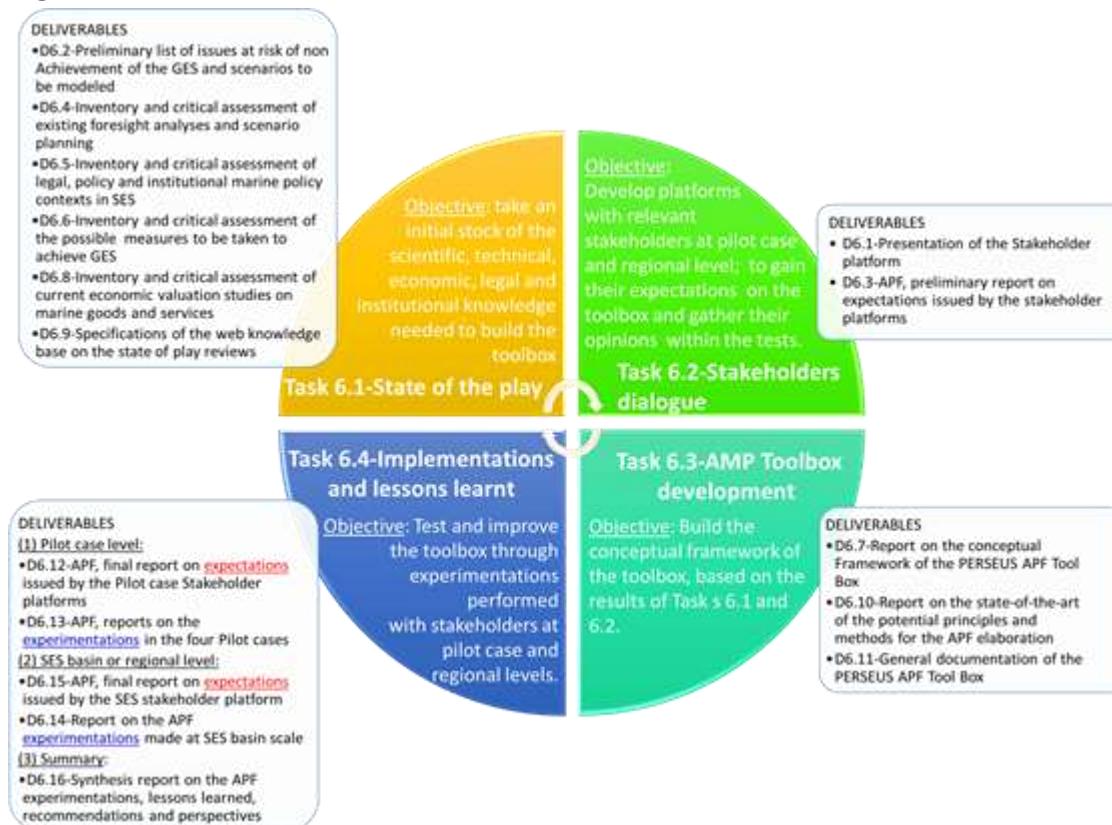
Figure 8: Organization of the tasks and deliverables developed by Work Package 6 within PERSEUS project.

1. DESIGN AND IMPLEMENTATION OF THE AMP TOOLBOX AND ASSOCIATED TASKS AND DELIVERABLES

The AMP Toolbox is the result of common efforts of PERSEUS scientific partners and members of the Stakeholder platforms, and has been developed according to the following tasks:

✓ Task 6.1-"State of play": Provides the basic information on scientific, technical, economic, legal and institutional knowledge necessary to develop the AMP Toolbox. Thematic data bases developed within this task constitute the Knowledge base associated to the AMP Toolbox (see, Σφάλμα! Το αρχείο προέλευσης της αναφοράς δεν βρέθηκε.).

✓ Task 6.2-"Stakeholder dialogue": As the AMP Toolbox is developed for actual application in the Mediterranean Sea and Black Sea regions, the needs and expectations of stakeholders and decision-makers within this region are of crucial importance. Task 6.2 provides a means for:

o Developing four stakeholders' platforms at Pilot case level (i.e. one per Pilot case, including the Western Black Sea, the Aegean Sea, the Adriatic Sea and the Western Mediterranean Sea) and one stakeholders' platform at Southern European Seas (SES) or basin level (results reported in D6.1-"Presentation of Stakeholder Platforms"). The SES Stakeholders' platform is basically formed by the members of the Advisory Board of PERSEUS project.

o Dialogue with stakeholders on the expectations of the AMP Toolbox. The consultations with the stakeholders at Pilot case level consisted of "Online questionnaires" and "Face-to-face interviews". Additionally, the dialogue with the SES or basin level stakeholders took place during the celebration of the 2nd PERSEUS General Assembly and Advisory Board Meeting (24-25/01/2013, Barcelona, Spain). Results at both levels (i.e. pilot case and basin levels) have been reported in deliverable D6.3-"Preliminary report on expectations and needs of the end users of the Adaptive Policy Framework (APF), at sub-basin Pilot Cases and Southern European Seas levels, feedbacks from the presentation of the APF application". Though, in the following box, main concerns raised by the Advisory Board have been collected.

o Dialogue with stakeholders on their experimentations and recommendations. The dialogue with the pilot case level stakeholders consisted of face-to-face interviews or small workshops. The dialogue with the SES or basin level stakeholders also took place by means of different workshop during the celebration of the "International Black Sea Day" (03/10/2014, Istanbul, Turkey) and the "3rd PERSEUS General Assembly and Advisory Board Meeting" (01/12/2014, Marrakech, Morocco). Results have been reported in deliverables D6.12 and D6.15-"Final reports on expectations issued by stakeholders' platforms", at Pilot case level and SES or basin level respectively.

Accordingly, the dialogue with the stakeholders is certainly linked to both, the development as well as the implementation or test of the AMP Toolbox.

✓ Task 6.3-"AMP Toolbox development": Comprises the design of a toolbox in order to operationalize the design and implementation of adaptive policies and translate adaptive management into decision tools under the requirements of the Marine Strategy Framework Directive. For this purpose, three actions have been performed:

o Build the conceptual framework of the AMP Toolbox, based on tasks 6.1 and 6.2 (results reported in D6.7-"Report on the conceptual framework of the PERSEUS AMP Toolbox").

o Conduct a state-of-the-art assessment of the potential principles and methods for the Adaptive Policy Framework elaboration (results reported in D6.10-"Report on the state-of-the-art of the potential principles and methods for the AMP elaboration").

o Build the toolbox and present it in a user-friendly manner to the users (i.e. based on web applications) (D6.11-"General documentation of the

PERSEUS AMP Toolbox"). In fact, the AMP Toolbox is being implemented on a dedicated part of the PERSEUS web site (http://www.perseus-net.eu/en/about_the_apf_toolbox/index.html) in the framework of Task 9.4-"Targeted communication tools for policy-makers, scientists & environmental organisations".

✓ Task 6.4-"Implementation and lessons learned": Is dedicated to test the AMP Toolbox in the four pilot cases (D6.13) as well as at SES or basin level in collaboration with stakeholders. The insights gained in the tests have been thoroughly documented in D6.13 and D6.14 respectively, and they serve to further elaborate and improve the AMP Toolbox. These two deliverables inevitably overlap with deliverables D6.12 and D6.15 (Final reports on expectations issued by stakeholders' platforms at Pilot case and SES or basin levels respectively). Though, while D6.12 and D6.15 are focused on collecting stakeholders' perceptions about the AMP Toolbox; the D6.13 and D6.14 are more focused on describing the experimentations and their technicalities.

1.1 Links with other deliverables

As already mentioned, the present report D6.16, provides a synthesis on the experimentations of the AMP Toolbox and final recommendations / lessons learnt. It is linked backwards to all previous reports within WP6 that led to the inception, design and web-based implementation of AMP. These are:

✓ Deliverable D6.7, which provided a first outline of the conceptual framework of the PERSEUS AMP Toolbox;

✓ Deliverable D6.9, which provides keys to link the Perseus Knowledge base to the five steps structuring the AMP Tool Box;

✓ Deliverable D6.10, which provides an overview of the state-of-the-art of existing principles and methods for drafting adaptive policies and further elaborates the steps designated in Deliverable 6.7;

✓ Deliverable D6.11, which specifies the presentation of the results of this Task on the web;

✓ Deliverable D6.12, which presents the results of the various exercises of stakeholder consultation carried out within the Stakeholders Platforms (SHPs)

✓ Deliverable D6.13, which reports on the AMP experimentations at SES pilot cases

✓ Deliverable D6.14, which reports on the experimentations at SES basin scale

✓ Deliverable D6.15, which reports on expectations issued by the SES stakeholder platforms

Appendix II.a: Dissemination material for AMP Toolbox

Special features of the Toolbox

- The PERSEUS AMP Toolbox provides a one-stop single location for policymakers to access all the resources and tools needed to develop and implement truly adaptive marine policies in the Mediterranean and Black Seas, in line with the EU's Marine Strategy Framework Directive. These resources are conveniently available in one place, alleviating the need for further online research.

- The AMP Toolbox is unique in that it provides a complete set of legal, scientific and predictive resources focused on MFSD descriptors in the Mediterranean and Black Seas. It aids in the planning, communication and implementation of flexible marine policies that will be effective over the long term.

- The resources in the toolbox are simple to use and although based on scientific data, they are presented in a user-friendly format specifically geared towards policymakers.

About PERSEUS

PERSEUS is a policy-oriented, marine research project aimed at supporting regional policymakers for the Southern European Seas. The PERSEUS project gathers new knowledge on our ecosystems, analyses the data with new tools, and puts forward recommendations that assist policymakers to take decisions based on solid scientific evidence. The PERSEUS project is unique in that it facilitates the incorporation of scientific data into innovative tools to help policymakers meet the objectives of the Marine Strategy Framework Directive (MSFD).

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Or fill in our online survey on the PERSEUS website!

The PERSEUS project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration.

Programme funded by the EU

PERSEUS
POLICY-ORIENTED MARINE ENVIRONMENTAL RESEARCH IN THE SOUTHERN EUROPEAN SEAS

Adaptive Marine Policy
AMP Toolbox

AMP Toolbox

A decision support tool for policymakers developing marine environment policies in the Mediterranean and Black Seas

Developed by the EU-funded PERSEUS Project

Appendix II.b:AMP Example: Marine Litter in the Mediterranean and Black Sea

In order to provide insights into the different steps, key activities and resources, the problem of marine litter in the Mediterranean and Black Seas will be analyzed with the AMP Toolbox. In fact, proper waste management in marine environment is increasingly recognized by international community; and several mandates such as the MSFD require maintaining properties and quantities of marine litter at levels that do not cause harm to the marine environment, through adaptive (i.e. ecosystem-based) management. Accordingly, using this important issue as a guiding example, the guidelines and principles (**2.2. Guiding** Principles) provided within the different steps and activities are described and several resources (**2.4.4.1.**) are illustrated.

Step1-Set the scene

The first step is to acknowledge that there is a problem, that causes negative impacts and that these merit further analysis and management strategies. Developing a strategy to manage marine litter requires a good understanding of the source of the problem, the scale of the problem and the impacts of the problem. Accordingly it is necessary to "Gather information and determine existing conditions". For this purpose, the "DPSWR framework" is proposed within the AMP Toolbox, a useful framework to link the effects that socio-economic uses have in the marine ecosystems as well as the effects that the degradation of the marine environment causes on human wellbeing.

Figure 1: Application of the DPSWR framework to the Marine Litter problem in the Mediterranean and Black seas.

For example, as observed in Figure 1, land-based sources (including land-based activities and coastal tourism), rather than ocean-based sources, are the main sources of marine litter in the Mediterranean and Black Seas (Galgani et al. 2013; UNEP 2009). Then, this litter is accumulated in the Mediterranean and Black Seas ecosystems. In fact, recordings of floating litter have confirmed the overwhelming presence of plastics in the Mediterranean Sea, accounting for about 83% of observed marine litter items (Galgani et al. 2013). Other known ecological impacts of marine litter include the alteration, damage and degradation of benthic habitats such as coral reefs and benthic macro-invertebrates and entanglement in and ingestion of marine debris by marine organisms (Galgani et al. 2013; Katsanevakis et al. 2007; Pham et al. 2014). Apart from the aesthetic problem, this environmental degradation causes significant socio-economic impacts such as, loss of tourism and related revenues and endangerment of human health and safety. In addition, it has important financial implications for the fishing sector (Galgani et al. 2013; Oosterhuis et al. 2014; Pham et al. 2014).

Additionally, it is necessary to "Involve experts and stakeholders" to make them understand the extent of the problem. This will help to create the "political will" and support for potential action (Ten Brink et al. 2009). In fact, other authors (Bainbridge et al. 2011), have highlighted the lack of stakeholder engagement in the

implementation of the MSFD at all the relevant (and necessary) scales and the importance of engaging public consultation and active partnerships from the beginning of the process (according to the ecosystem-based approach). In the case of marine litter also, a multi-sectoral engagement would be necessary (i.e. Regional, national and local authorities, Maritime sector, Tourism sector, Fisheries and aquaculture, Agriculture, Industry, and Civil society). To accomplish this activity, Stakeholders Mapping or Analysis is suggested in the AMP Toolbox. In Figure 2, for example, the principal sectors that are affected by the problem are presented by means of the "Stakeholders Analysis" tool included in the AMP Toolbox.
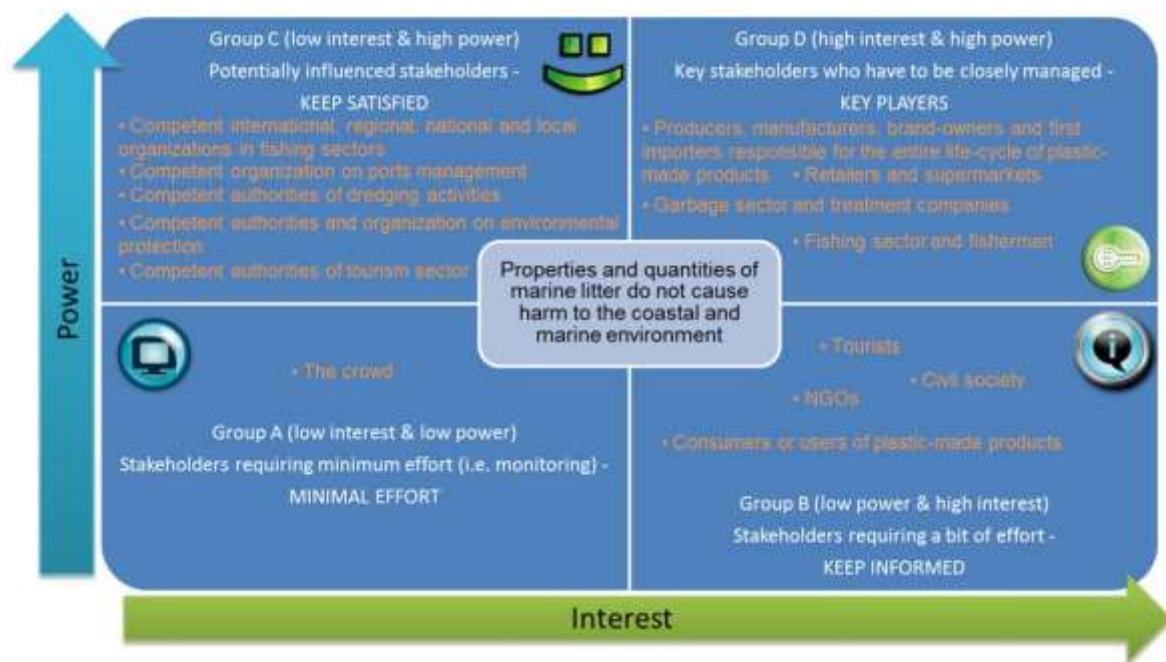
Figure 2: Stakeholders analysis for the Marine Litter problem in the Mediterranean and Black Seas.

Once the current situation has been defined and the stakeholders engaged, and before the possible solutions are listed; it is helpful to develop a clear set of objectives that the policy needs to address, and the particular issues it needs to take into account. Initiatives for new actions will need to build on both an understanding of the problem as well as the benefits of addressing the problem. Indeed, for an effective delivery of the EBA, apart from the multi-sectoral engagement, the valuation of the ecosystem services and the recognition of the tight coupling between human and ecological well-being are necessary (Bainbridge et al. 2011; Tallis et al. 2010). Accordingly, it is important to "Develop a mutual understanding and define principles and goals". Within the Honolulu Strategy (UNEP and NOAA 2011) for example, the following three objectives (and the strategies to accomplish these objectives respectively) have been defined (Table 1).

Table 1: Framework proposed within the Honolulu Strategy (UNEP and NOAA 2011).

Goal A: Reduced amount and impact of land-based sources of marine debris introduced into the sea
Strategy A1. Conduct education and outreach on marine debris impacts and the need for improved solid waste management

Strategy A2. Employ market-based instruments to support solid waste management, in particular waste minimization
Strategy A3. Employ infrastructure and implement best practices for improving stormwater management and reducing discharge of solid waste into waterways
Strategy A4. Develop, strengthen, and enact legislation and policies to support solid waste minimization and management
Strategy A5. Improve the regulatory framework regarding stormwater, sewage systems, and debris in tributary waterways
Strategy A6. Build capacity to monitor and enforce compliance with regulations and permit conditions regarding litter, dumping, solid waste management, stormwater, and surface runoff
Strategy A7. Conduct regular cleanup efforts on coastal lands, in watersheds, and in waterways— especially at hot spots of marine debris accumulation
Goal B: Reduced amount and impact of sea-based sources of marine debris, including solid waste; lost cargo; abandoned, lost, or otherwise discarded fishing gear (ALDFG); and abandoned vessels, introduced into the sea
Strategy B1. Conduct ocean-user education and outreach on marine debris impacts, prevention, and management
Strategy B2. Develop and strengthen implementation of waste minimization and proper waste storage at sea, and of disposal at port reception facilities, in order to minimize incidents of ocean dumping
Strategy B3. Develop and strengthen implementation of industry best management practices (BMP) designed to minimize abandonment of vessels and accidental loss of cargo, solid waste, and gear at sea.
Strategy B4. Develop and promote use of fishing gear modifications or alternative technologies to reduce the loss of fishing gear and/or its impacts as ALDFG
Strategy B5. Develop and strengthen implementation of legislation and policies to prevent and manage marine debris from at-sea sources, and implement requirements of MARPOL Annex V and other relevant international instruments and agreements
Strategy B6. Build capacity to monitor and enforce (1) national and local legislation, and (2) compliance with requirements of MARPOL Annex V and other relevant international instruments and agreements
Goal C: Reduced amount and impact of accumulated marine debris on shorelines, in benthic habitats, and in pelagic waters
Strategy C1. Conduct education and outreach on marine debris impacts and removal
Strategy C2. Develop and promote use of technologies and methods to effectively locate and remove marine debris accumulations
Strategy C3. Build capacity to co-manage marine debris removal response
Strategy C4. Develop or strengthen implementation of incentives for removal of ALDFG and other large accumulations of marine debris encountered at sea
Strategy C5. Establish appropriate regional, national, and local mechanisms to facilitate removal of marine debris
Strategy C6. Remove marine debris from shorelines, benthic habitats, and pelagic water

Overall, the adaptive policies might focus on setting goals and targets at the more local level, with a stakeholder led process propagating from local spatial scales upwards toward a unified regional vision and legal formalization (Bainbridge et al. 2011; Tallis et al. 2010). In fact, cooperation and coordination on a regional seas basis is an asset for a meaningful development and implementation of the EBA (Bainbridge et al. 2011). Accordingly, the use of existing institutional structures such as the

regional seas commissions and international organization should be promoted (Bainbridge et al. 2011). Indeed, the process will be more effective and simpler when there are clear institutional authorities for action and enforcement (Ten Brink et al. 2009).

Table 2: Indicative list of intergovernmental organizations which directly or indirectly enforce marine litter management.

Name	Objective
Black Sea Commission (BSC)	The BSC and its Permanent Secretariat consolidate the regional activities on marine litter and other types of marine pollution on base of the implementation of the Bucharest Convention and its Protocols, and the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea.
	Moreover, 7 Black Sea Regional Activity Centres (RAC) have been established on base of existing national organizations. Four of them may be especially helpful for the development of the regional ML activities: RAC on Pollution Monitoring and Assessment; RAC on Control of Pollution from Land Based Sources; RAC on Development of Common Methodologies for Integrated Coastal Zone Management; and, RAC on Environmental and Safety Aspects of Shipping.
Mediterranean Action Plan (MAP)	The MAP is a regional cooperative effort involving 21 countries bordering the Mediterranean Sea, as well as the European Union. Through the MAP, these Contracting Parties to the Barcelona Convention and its Protocols are determined to meet the challenges of protecting the marine and coastal environment while boosting regional and national plans to achieve sustainable development.
	MAP Coordinating Unit is the Secretariat of the Mediterranean Action Plan. It performs diplomatic, political and communications roles, supervising the main MAP components (MEDPOL Programme and the Regional Activity Centres) and organizes major meetings and programmes. Six RACs are based in Mediterranean countries, each offering its own environmental and developmental expertise for the benefit of the Mediterranean community in the implementation of MAP activities. At COP 18 in 2013, a regional plan was adopted for management of marine litter in the Mediterranean Sea.
United Nations Environment Programme (UNEP)	Marine litter is a priority activity for the UNEP's Regional Seas Programme. UNEP provides support to the secretariats of the Black Sea Commission and the Mediterranean Action Plan´s secretariat for the development of Regional Activity on Marine Litter in the Black Sea and the Mediterranean Sea respectively. In addition, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)

	has been adopted under the auspices of UNEP.
International Maritime Organization (IMO)	Involved, in particular, in regulatory and technical co-operation activities regarding port reception facilities. IMO maintains the Oil and Litter Information Network and adopted the Guidelines for the implementation of MARPOL.
World Health Organization (WHO)	Considers the marine litter problem as important constituent of medical, sanitary and aesthetic issues focused on the safe and salubrious use of the aquatic and coastal environment for public recreation and tourism. It has published monitoring, control and prevention strategies relating to the hazards associated with marine litter.
Food and Agriculture Organization of the United Nations (FAO)	Has prepared the Code of Conduct for Responsible Fisheries (adopted in 1995) and technical guidelines for the implementation of the Code, including management objectives and measures related to the marine litter problem. The Fisheries Industry Department of FAO has a programme on the "Impact of Fishing on the Environment". FAO and IMO are involved in revising the Code of Safety for Fishing Vessels where the effects of litter could be included as an issue of concern.
Intergovernmental Oceanographic Commission (IOC)	The 6th Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment (1986) recommended developing methodologies and facilitating efforts to monitor the amounts and types of persistent litter in the seas. Some relevant activities, including several pilot ML surveys and assessments, and the development of solid waste management plans, were realized in 1987- 1999 in the Mediterranean and Caribbean regions, and in some places along the coasts of Africa.
Mediterranean Science Commission (CIESM)	Promotes cooperation among marine scientists of various disciplines. In service to society, CIESM draws upon its experts and the current scientific knowledge to deliver impartial and authoritative advice on a variety of issues, focused on the dynamics, processes, biodiversity, pollution and lasting protection of the Mediterranean and Black Sea ecosystems. In addition through its monitoring programs, the Commission keeps a watch at the regional level over sensitive indicators of the ecosystem change.
Joint group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP)	A multidisciplinary advisory panel involved in the protection of the marine and coastal environment at the global level. GESAMP addresses litter as one of important sources/categories of the adverse impact of land-based activities on the ocean. The priority actions recommended are as follows: improvement of waste materials recycling; improvement of port reception facilities; development of more degradable packaging materials; and improvement of

education and public awareness	
European Commission (EC)	The EC has adopted several legal instruments covering a wide range of the environment-oriented fields. For example, the Waste Framework Directive (1975), the Directive on Hazardous Waste (1991), the Directive on Integrated Pollution Prevention and Control (1996), the Directive on the Landfill of Waste (1999), the Directive on Port Reception Facilities for Ship-generated Waste and Cargo Residues (2000), the Marine Strategy Framework Directive (2008) and some other directives which have certain relation to the marine litter problem.

In Table 2, for example, a list of the intergovernmental organizations related to the marine litter problem that can be found in the "Institutional inventory" of the AMP Toolbox is presented. Although, these organizations are necessary to implement consistent and cooperative strategies, it is important to decentralize the authority and responsibility for decision-making to the lowest effective and accountable unit of governance as mentioned above (Swanson and Bhadwal 2009). This can increase the capacity of a policy to perform successfully under uncertain conditions. In fact, those closely connected to the resource system, are in a better position to adapt to and shape ecosystem changes and dynamics than remote levels of governance (Bainbridge et al. 2011; Swanson and Bhadwal 2009).

Last but not least, legal and administrative obligations such as international agreements laws and regulations should be identified, with the aim of defining consistent objectives and strategies. An example of these legal and administrative instruments regarding marine litter can be found in the "Legal inventory" of the toolbox (Table 3). Note that although many of these instruments do not target marine litter directly (since they aim reducing marine pollution, waste production and dispersal or protecting the marine environment in more general terms), they have an indirect effect in marine litter.

Table 3: Indicative list of International and regional legal and administrative instruments. Note: Although these legal and administrative instruments do not target marine litter directly, they target reducing marine pollution or waste production and dispersal as well as protecting the marine environment in more general terms.

Title	Objective
Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)	To control and prevent marine pollution by prohibiting the dumping of certain hazardous materials. In addition, a special permit is required prior to dumping of a number of other identified materials; and, a general permit for other wastes or matter.
Convention for the Prevention of Pollution from Ships (MARPOL) (London protocol)	To prevent pollution of the marine environment by ships from operational or accidental causes.
Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal (Basel Convention)	To provide for a comprehensive regime for liability and for adequate and prompt compensation for damage resulting from the trans-boundary movement of hazardous wastes and other wastes and their disposal including illegal traffic in those wastes.
Convention on Biological Diversity (CBD)	Conserve biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.
UNEP Global Marine Litter	Establishment and development of pilot regional activities in regions that are particularly affected; and, provide a global platform for the establishment of partnerships, co-operation and co-ordination of activities for the control and sustainable management of marine litter.
United Nations General Assembly resolutions on Oceans and the Law of the Sea and on sustainable fisheries	Lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole.
Fifth International Marine Debris Conference (5IMDC) and Honolulu strategy	To prevent, reduce, and manage marine debris.
Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) (and the Global Partnership on Marine Litter (GPML)	To deal with all land-based impacts upon the marine environment, specifically those resulting from sewage, persistent organic pollutants, radioactive substances, heavy metals, oils (hydrocarbons), nutrients, sediment mobilization, litter, and physical alteration and destruction of habitat. (GPML-Voluntary multi-stakeholder coordination mechanism in which all partners agree to work together to better reduce and better manage marine litter)
International Conference on Prevention and Management of Marine Litter in European Seas	(i) Start filling in the obligation of Rio+20; (ii) Be the European contribution to the Honolulu strategy; (iii) Bring existing and planned marine litter initiatives to the attention of a wider audience, including politicians by providing a platform to collect and share good practices and Commitments; (iv) Support information exchange amongst Member States and a coherent

	implementation of the MSFD on European level in order to combat litter pollution of marine waters.
Convention on the Protection of the Black Sea against Pollution (Bucharest Convention) and its protocols	To prevent, reduce and control the pollution in the Black Sea in order to protect and preserve the marine environment and to provide legal framework for co-operation and concerted actions to fulfil this obligation.
Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) and its protocols	To prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area and to protect and enhance the marine environment in that Area so as to contribute towards its sustainable development
UNEP/ Mediterranean Action Plan´s Ecosystem Approach (EcAp)	EcAp refers to a specific process under the UNEP/MAP Barcelona Convention, as its Contracting Parties have committed to implement the ecosystems approach in the Mediterranean with the ultimate objective of achieving the good environmental status (GES) of the Mediterranean Sea and Coast. This process aims to achieve GES through informed management decisions, based on integrated quantitative assessment and monitoring of the Marine and Coastal Environment of the Mediterranean. The EcAp process is implemented in the Mediterranean in synergy and coherence with the EU's MSFD principles
Regional Plan on Marine Litter Management in the Mediterranean in the Framework of Article 15 of the Land Based Sources Protocol of the Convention of Barcelona	The main objectives of the Regional Plan are to: (a) Prevent and reduce to the minimum marine litter pollution in the Mediterranean and its impact on ecosystem services, habitats, species in particular the endangered species, public health and safety; (b) Remove to the extent possible already existent marine litter by using environmentally respectful methods; (c) Enhance knowledge on marine litter; and (d) Achieve that the management of marine litter in the Mediterranean is performed in accordance with accepted international standards and approaches as well as those of relevant regional organizations and as appropriate in harmony with programmes and measures applied in other seas.

Step 2-Assemble the basic policy

Once the problem has been addressed and the desired objectives defined, it is necessary to find different possible solutions and make an analysis of the policy proposals. Accordingly, this step includes two activities, "*Identify measures*" and "*Prioritize/assess new measures*". The former requires that the policy-makers look at the full range of possible solutions and develop a list of options (**Table**), taking into consideration the objectives of the policy and the particular issues it needs to take into account. In adaptive policy-making, variation is an important principle to consider in the selection of measures or instruments, since the diversification of the intervention increases the possibilities of succeeding under unanticipated conditions (Swanson and Bhadwal 2009). Moreover, on occasions, a policy is not feasible given political commitments, potential public resistance or capacity constraints. Accordingly, participation by stakeholders enhances the acceptance of the instruments as well as offer ideas whether they would be successful or not. In other

words, the involvement of many groups and sectors will help ensure the solution to marine litter is practical and enforceable (i.e. feasible) (Ten Brink et al. 2009).

Several types of assessment methods exist which are useful to assess potential measures. These include, for example, impact assessments, cost-effectiveness analysis, coast-benefit analysis, and multi-criteria analysis. Information on these tools can be found within the "*Prioritize/assess new measures*" key activity. In addition, the "*Marine valuation database*" of the AMP Toolbox contains studies regarding valuations of different management strategies and scenarios. In one of these studies, for example, the perceptions of different visitors on the management of an important nesting site for loggerhead sea turtle located in the Greek coast revel that an accommodation tax would be more effective policy when compared to an entrance fee, for the management of the site.

HOW OTHERS DID?

Cost-Benefit Analysis:

Descriptor 5 (Eutrophication) in the North Sea: Bertram and Rehdanz (2013); and Bertram et al. (2014) (http://www.sciencedirect.com/science/article/pii/S0308597X12001042 and http://www.sciencedirect.com/science/article/pii/S0308597X13001437)

Table 4: Marine litter categories and some examples of economic instruments to combat marine litter. Source: Ten Brink et al. (2009).

Economic Instruments	Lad-based sources				Ocean-based sources				
	Plastic	Other solid waste	Medical	Sewage related debris	Plastic	Other solid waste	Sewage related debris	Nets and boxes	Fishing debris
Plastic bag tax					X				
Charging schemes for waste services		X	X						
Landfill tax		X	X						
Deposit for drink containers		X			X				
Port reception fee					X	X	X		
Incentives to fishermen for reporting and retrieval/removal of debris					X	X			X
Award-based incentives for coastal villages with Integrated Waste Management		X	X						
Damaged/abandoned fishing gear buy-back								X	
Tourist taxes, car parking fees, waterfront business charges and other sources of revenue to earmark for beach cleaning	X	X							
Fine for illegal disposal of litter/fly tipping/pet waste fouling	X	X							
Ship garbage record books					X	X	X	X	X
Fines register					X	X	X	X	X

However, the most important thing at this point is to define the right set of criteria against the different options will be assessed. The selection of the criteria will depend on the international or national conditions/circumstances. Ten Brink et al. (2009), have defined ten criteria that can be useful to analyze the potential options (Table 5). In fact, the choice of the appropriate measure is case specific, largely depending on: (i) the source of pollution (land-based source, e.g. tourist tax, vs. ocean-based sources, e.g. rewards for fishing vessels that return waste); (ii) the country´s institutional characteristics and infrastructures (e.g. to launch a landfill tax, the country should have implemented a proper waste management strategy and a properly functioning waste collection and disposal procedure); (iii) consumer´s preferences and habitual behavior (i.e. the effect of a measure can temporarily change the behavior and last only as long as the measure is in place); and, (iv) the economy´s overall sectorial composition (Oosterhuis et al. 2014).

Table 5: Indicative list of potential 10 criteria to select policy options. Source: Ten Brink et al. (2009).

Instrument	1 Important	2 Benefits	3 Revenues	4 Fair and equitable	5 Avoids unacceptable social impacts	6 Consistent	7 Cost-effective	8 Efficient pricing	9 Underst andable	10 Feasible	Index
Plastic bag tax	5	5	5	5	4	5	5	5	5	4	48
Landfill tax	5	3	5	5	1	5	4	5	4	3	40
Deposit for drink containers	5	4	1	5	3	5	5	5	5	4	42
Port reception fee (general fee, no special fee for waste)	4	4	4	5	5	5	4	4	4	5	44
Incentives for fishermen (for reporting and removal)	4	4	1	4	5	4	5	3	5	5	40
Award-based incentives for coastal villages with Integrated Waste Management systems	4	4	1	4	5	3	5	3	5	5	39
Waste fishing gear buy-back	5	5	1	5	5	3	5	3	5	5	42
Tourist taxes, car park fees, waterfront business charges and other sources of revenue to earmark for beach cleaning	5	4	5	5	5	5	4	5	5	5	48

Step 3-Make the policy robust

The policy measures drafted in Step 2 must be assembled into a policy which is robust against future expected and unexpected conditions. This constitutes probably the most specific and innovative step of the AMP Toolbox policy cycle. For this purpose it is necessary to: (i) identify key factors that affect policy performance as well as the scenarios to study the way these factors might evolve in the future; and, (ii) develop indicators to help trigger important policy adjustments when needed. Accordingly, "*Forward looking analysis: assess policy success and risk factors*" and "*Design and implement a monitoring plan*", are respectively elementary activities within Step 3.

To identify the key factors that affect policy performance it is necessary to develop a deliberative process with multiple stakeholders and experts involved in implementation of the policy as well as those who are affected (positively or negatively) by the policy in question. Potential future evolution of the key factors can be projected using a combination of qualitative and quantitative methods. Scenarios are a coherent package of key factors. Coherence is achieved by understanding the higher-level drivers for these key factors and how these drivers influence the various key factors. In **Table** the potential future evolution of key sector related to the marine litter are presented for the Mediterranean and Black seas respectively. Scenarios are then quantified using predictive models. Models typically express benefits and costs as outputs of management through time. More importantly, they allow forecasting the impacts of the policy. Models can be as informal as a verbal description of system dynamics, or as formal as a detailed mathematical expression of change, or also an integrated model, such as those developed by the PERSEUS Project (Table 7).

Moreover, monitoring is a key component in adaptive policies, providing information to evaluate the status of the ecosystems (i.e. environmental status, under the MSFD) and triggering policy adjustments in case targets are not achieved; as well as, facilitating information, evaluation and learning after decisions are made. To make monitoring useful, the motivation of the monitoring, choices on the monitoring strategy (i.e. selecting the targets and associated indicators to monitor and how to monitor them), and the practical limits (e.g. staff and funding) should be made a priority.

In fact, environmental targets (i.e. indicate either the desired levels of, or necessary changes to, pressures, state and impacts which would ultimately result in the achievement of GES) are of paramount importance to guide progress toward achieving GES. Nowadays humans are also part of the marine ecosystem (i.e. users). Accordingly to, in order to get sustainable activities, compatible with the conservation of marine ecosystems, some environmental targets for a good status must be defined (Borja et al. 2012). However, due to the lack of data and knowledge on the amount of marine litter in the different marine compartments and the transport (i.e. meteorological and/or hydro-morphological processes) and flux mechanisms (i.e. physical fluxes such as the deposition and degradation rates; and, biological fluxes such as absorption and ingestion rates) among them, it is difficult to assess where an ecosystem is positioned along a trajectory toward recovery (Borja et al. 2012). Accordingly, in these cases directional/trend targets (i.e. continuous improvement in state but where a final end point cannot be identified) can be useful.

Table 6: Direction of change for drivers or activities particularly related to marine litter for the five PERSEUS scenarios for the Mediterranean and Black Seas. Key: 0 same as present state; + more than present state (slow increase); ++ much more than present state (net increase); - less than the present state (slow decrease); -- much more than present state (net decrease).

SECTOR		SCENARIO				
		Business as Usual	Convergence with proactive environmental management	Convergence with reactive environmental management	Heterogeneity with proactive environmental management	Heterogeneity with reactive environmental management
MEDITERRANEAN SEA						
Tourism	Mass tourism demand	0/+	-	++	0/+	+
	Luxury tourism	0/+	+	++	0/+	-
	Local/cultural tourism	0/+	++	++	+	-
	Eco-tourism	0	++	--	+	0
Coastal Development/ Urbanization	Population	++	+	++	+	++
	Expansion of settlements	+	0/-	++	0	++
Fisheries/ aquaculture	Fisheries production	0/-	++	0	+	--
	Aquaculture production	+	+	++	0/+	+
Maritime transport/ports	Expansion of port areas	0/+	+	++	0/-	0/+
	Increase of transports	0/+	++	++	0/-	0/-
BLACK SEA						
Tourism	Mass tourism demand	0/+	+	++	0/+	-
	Luxury tourism	0	++	+	-	--
	Local/cultural tourism	0/+	++	++	+	-
	Eco-tourism	0/+	++	0/+	+	0
Coastal Development/ Urbanization	Population	+	+	++	+	0/+
	Expansion of settlements	+	0/+	++	0/+	+
Fisheries/ aquaculture	Fisheries production	0	+	0/+	0/-	-
	Aquaculture production	+	+	++	0/+	+
Maritime transport/ports	Expansion of port areas	0/+	++	0/-	0	0/+
	Increase of transports	++	++	0/-	0/-	0/+

Table 7: List of different models' examples used within PERSEUS project to develop an "End to End" approach.

Type of model/component	Link
Hydrodynamic models	
Regional Ocean Model System (ROMS)	http://iod.ucsd.edu/~falk/roms_class/shchepetkin04.pdf.
Princeton Ocean Model (POM)	http://web.stevens.edu/ses/ceoe/fileadmin/ceoe/pdf/alan_publications/AFB032.pdf.
Nucleus for European Modelling of the Ocean (NEMO)	http://www.nemo-ocean.eu/About-NEMO/Reference-manuals.
Proudman Oceanographic Laboratory Coastal Ocean Modelling System (POLCOMS)	http://cobs.pol.ac.uk/modl/metfcst/POLCOMS_DOCUMENTATION/node4.html.
Lower Trophic Level models	
Biogeochemical Fluxes Model (BFM)	- http://bfm-community.eu/publications/bfmV5manual_r1.0_201303.pdf.
Nitrogen, Phytoplankton, Zooplankton, Detritus (NPZD)	- http://ic.ucsc.edu/~kudela/OS130/Readings/Franks,2002.pdf.
European Regional Seas Ecosystem Model (ERSEM)	- http://www.sciencedirect.com/science/article/pii/0077757995900470.
Higher Trophic Level models	
Ecopath with Ecosim (EwE)	- http://www.seaaroundus.org/journal/christensenwalters2004a.pdf.
Object-oriented Simulator of Marine biOdiverSity Exploitation (OSMOSE)	- http://www.sciencedirect.com/science/article/pii/S0990744001011068.
Lagrangian tool for modelling ichthyoplankton dynamics (ICHTHYOP)	- http://www.brest.ird.fr/personnel/ppenven/publications/lett_ems2008.pdf.

Acknowledging these constraints, the main mandates propose using trend indicators to monitor the achievement of the environmental targets. The MSFD proposes four indicators regarding marine litter (European Commission 2010): (i) Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source; (ii) Trends in the amount of litter in the water column (including floating at the surface) and deposited on the seafloor, including analysis of its composition, spatial distribution and, where possible, source; (iii) Trends in the amount, distribution and, where possible, composition of micro-particles (in particular micro-plastics); and, (iv) Trends in the amount and composition of litter ingested by marine animals (e.g. stomach analysis). Moreover, to make progress in the Mediterranean Action Plan´s Ecosystem Approach, 18 "common indicators" have been defined (UNEP/MAP 2014). Among these indicators the abovementioned four indicators have been also proposed. The only difference is that indicators (ii) and (iii) have been unified into a unique one. Furthermore, not only the indicators should be standardized and harmonized, but also the methods to monitore them. Galgani et al. (2013) make a summary of different approaches to monitor marine litter in different marine compartments and their positive and negative aspects (Table 8).

Table 8: Summary of approaches for assessing GES with regards to marine Litter. Source: Galgani et al. (2013).

Compartment	Approaches	Positive aspects	Poorly covered and negative aspects
Coastline	Counts of the amount of litter items on known stretches of coast.	Allows for assessment of composition, amounts, sources, trends, social harm (aesthetic, Economic).	Very small items and micro-particles in sediments are not quantified. Not all coasts are accessible or appropriate.
Sea surface.	Ship observers.	Precise evaluation at local scale.	Depending on weather. Not at large scale, small debris not considered, strong temporal variation
Sea surface and water column	Trawling and water filtration.	Precise evaluation at local scale, consider smaller debris.	Costs, strong temporal variation.
Sea surface	Aerial counts of the number of litter items floating on the sea surface along transects.	Assessment of densities of litter on water surface over large areas possible; correlation with shipping or fisheries activities.	Smaller items not covered. Only counts of items from TetraPak size upwards are possible.
Sea floor shallow	Visual survey with divers.	All substrate types, replicability, feasible to account for detectability.	Depth limitation (<40 m).
Sea floor, deep sea	Litter Trawling.	Replicability, possible standardization.	Only where trawling is possible.

Sea floor, deep sea litter	Submersibles and remote operated vehicles.	All sites accessible.	Only small areas, costs.
Entanglement rates of marine organisms	Entanglement rates in birds found on the coastline.	Can be carried out as part of existing surveys.	Standard protocol would need to be developed and implemented.
OSPAR Fulmar Plastic Ecological Quality Objective (EcoQO)	Mass of plastic in stomachs of beached seabirds (Fulmars).	Operational and tested in North sea. Applicable everywhere in most of OSPAR area.	Focuses on surface litter in offshore habitats; not yet operational in all EU regions: need further developing.
Ingestion by other marine organisms.	Abundance of plastic by mass	Potentially similar to Fulmar EcoQO approach.	Need to be developed and tested.
Micro-plastic on shorelines	Extraction of fragments from sediment samples and subsequent identification using FT_IR spectroscopy.	Positive identification of specific polymers.	Analysis is time-consuming and is unlikely to detect all of the micro-particles. This is especially true for very small fragments (<100 mm).
Micro-plastic at sea surface	Manta trawl (330 mm) and subsequent identification using FT_IR spectroscopy.	Positive identification of specific polymers.	Analysis is time-consuming and is unable to detect all of the micro-particles
Socio-economic	Assessment of direct costs through survey-based methods.	Provides indication of economic burden on marine and coastal sectors.	Does not capture full impact of degradation of ecosystem goods and services due to marine litter.

In addition, operational targets should be defined in relation to the nature of the management action required to achieve GES (e.g. amount of marine debris removed); or to assess progress towards full implementation of a specific measure (e.g. percentage of fishers using alternative/modified fishing gear by fishing fleet or area). Within the Honolulu Strategy (UNEP and NOAA 2011), several indicators are proposed to evaluate management strategies and their enforcement, focused on three areas: (i) decreasing land-based sources of marine debris; (ii) shipping, boating, and transport; (iii) removal of marine debris accumulations (Table 9).

Moreover, monitoring a system does not in itself make a policy to be adaptive. The value of monitoring in adaptive management is inherited from its contribution to decision making. Monitoring must be used to reduce uncertainty (e.g. comparing predictions produced by the models with data-based estimates). The analysis and assessment of monitoring data result in better understanding of system processes and the opportunity to improve management based on that understanding. Without periodic monitoring of the relevant resource attributes, learning about resource responses and subsequent adjustment of management actions are not possible.

Table 9: Potential evaluation questions and indicators to be considered in developing an approach to evaluating strategies. Source: UNEP and NOAA (2011).

DECREASING LAND-BASED SOURCES OF MARINE DEBRIS

What is the level of awareness of specific groups with BMPs, laws and regulations, and marine debris impacts?

- Number of stakeholders briefed by affiliation (for example, industry, government, public)
- Pre- and post-outreach tests for knowledge and intent
- Percentage of specific groups adopting BMPs (for example, waste haulers, packaging industry, institutions, environmental and health agencies)
- Recycling rates pre- and post-outreach

Are infrastructure and use of BMPs sufficient?

- Number of informal dumping sites
- Number of receptacles per quantity of beach, park, or street user
- Rate of escape of pre-production pellets into waterways
- Tonnage of solid waste recovered from waterways

What is the capacity to monitor and enforce compliance with regulations and permit conditions?

- Number/types of permits or regulations in place to prevent land-based debris
- Number of enforcement and compliance officers
- Number of violations
- Number of repeat violations
- Number of violations as a percentage of total permits

How effective are regulatory measures?

- Number of waterways exceeding allowed trash load
- Number of violations

How effective are litter and solid waste cleanup efforts at preventing marine debris?

- Frequency of clean-up activities by location
- Accumulation rate of trash by location
- Number of volunteers; number of hours
- Tonnage of solid waste recovered from coastal lands, watersheds, and tributary waterways
- Tonnage of solid waste recovered at booms and debris traps with and without watershed cleanups
- Number of removal actions necessary to maintain a set level of cleanliness

SHIPPING, BOATING, AND TRANSPORT

What is the level of awareness of specific groups of ocean users regarding BMPs, storage and disposal options, and legislation and policies?

- Percentage of ocean users by specific industry or group
- Percentage of ocean users briefed by specific industry or group
- Percentage of ocean users adopting best practices by specific industry or group
- Tonnage of lost cargo
- Cost of lost cargo

What percentage of specific groups of ocean users are using proper waste storage and disposal options?

- Percentage of ocean users using proper waste storage onboard and disposal at port reception facilities
- Tonnage of waste collected at port reception facilities

What is the level of awareness of fishers regarding BMPs, modified or alternative fishing gear, and legislation and policies?

- Percentage of fishers who think current practices and methods to prevent ALDFG sources are adequate by fishing fleet or area
- Percentage of fishers aware of BMPs, practices, and legislation by fishing fleet or area
- Percentage of fishers briefed by fishing fleet or area

What percentage of fishers are adopting best practices and modified or alternative fishing gear?

- Percentage of fishers adopting best practices by fishing fleet or area

- **Percentage of fishers using alternative/modified fishing gear by fishing fleet or area**
- **Number of gear items lost**
- **Tonnage of gear lost**
REMOVAL OF MARINE DEBRIS ACCUMULATIONS
How effective are methods to detect marine debris at sea?
- **Marine debris detection rate based on size of search area, number of search days, and number and size of marine debris accumulations detected**
How effective are removal efforts?
- **Amount of marine debris removed**
- **Amount of marine debris recovered through incentive programs**
- **Length of time between marine debris reporting and removal**

Step 4-Implement the policy

In order to ensure successful policy implementation, several basic conditions need to be fulfilled. In fact, implementing a policy, does not only consist on getting the legal text ready, but also ensuring that those (i.e. the public) who will face changes under the new policy understand that this is coming, its meaning and its implications if the policy it is not complied. Moreover, it is useful to ensure that those stakeholders and experts who were involved in the earlier activities are also included in the implementation (i.e. "*Involve experts and stakeholders*"). Different organizations will need to plan their part of the implementation, which will involve financial or human resources allocation. Finally, successful implementation also requires that the regulatory and institutional frameworks will be in place, including the capacity to monitore and enforce the new policy. Accordingly, planning the implementation process and the actions necessary for putting the policy into practice is highly important (i.e. "*Draw up an implementation plan*") in order to ensure enforcement and commitment from all actors. "Gantt charts" can be useful to organize actions along a timeline (Table 10).

Step 5-Evaluate and adjust policies

Finally, evaluation and adjustments are key aspects of adaptive policies. This step involves investigating whether and to what extent the policy is effective and how much of the problem has been addressed and what more needs to be done. This step creates both insights on the policy and, a basis for adjusting the policy. For example, if the evaluation phase reveals a problem, recommendations can be made to improve the efficiency of the policy.

As mentioned in Step 4, capacity to adjust to anticipated conditions is triggered by monitoring. Though, formal policy review and continuous learning are necessary to overcome unanticipated conditions.

In some cases, the cycle continues, starting again in steps number two, three, or four depending on whether further analysis of the problem is needed. However, for more fundamental changes, new legislation may be needed and the whole cycle repeated.

Table 10: Implementation plan example to manage Marine litter.

Task name	Jul.	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Designate and Formalize Roles and Responsibilities	■										
Designate stakeholder to take into account	■										
Develop an initial assessment of the state of the problem	■	■									
Identify drivers and consequences of actual state	■	■									
Review environmental legislation and other requirements	■	■									
Gain management approval and define the scope of the policy			■								
Define and prioritize measures				■							
Assess policy success looking for future uncertainties					■						
Identify and Develop Operational Controls / Emergency Plans						■					
Implement the planned policy							■	■	■		
Implement monitoring strategy							■	■	■		
Document and record monitoring results										■	

Appendix III.a: AMP Toolbox experimentation by pilot case

Totally, five different experimentations have been conducted for the evaluation of the AMP Toolbox by pilot site. These include the AMP experimentations in the Spanish part of Western Mediterranean, the French part of the Western Mediterranean, the Greek part of Eastern Mediterranean, the Adriatic AMP experimentation and the experimentation implemented in the Western part of the Black Sea. The main organizational details and the outcomes are presented in the following section per pilot case.

1.1. AMP experimentation in the Spanish part of the Western Mediterranean Pilot Case

3.1.1. Introduction

The main objective of this section is to present the activities carried out in Spain (Western Mediterranean Pilot Case) for testing the AMP Toolbox with different stakeholders in order to get their feedback and suggestions for further developments.

Two main activities were executed at the level of Pilot Case (Spain – Western Mediterranean): 1) workshop with research staff for practical hands-on testing of the tool; 2) face-to-face interview with marine environmental managers using one specific case study (bluefin tuna). The following sections describe the methodological approach and main results obtained in each one.

3.1.2. Experimentation with marine scientists

▪ Selection of participants

We selected a reduced number (5) of research staff from three different organizations in order to conduct a practical hands-on session with the AMP Toolbox. Participants were selected according to their knowledge about PERSEUS project and/or their previous involvement in the development of science-policy applications (Table 2).

After phone confirmation regarding their availability, an invitation email was sent to all the participants including a brief information note about the AMP Toolbox and the agenda of the workshop (Appendix III).

Table 8: List of the workshop participants.

Name	Job Title	Organization
Beatriz Morales-Nin	Director	CSIC-IMEDEA
Ignaci Català	Researcher	CSIC-IMEDEA
Patricia Reglero	Researcher	IEO
Lluís Gómez-Pujol	Researcher	SOCIB
Biel Frontera	Web-developer	SOCIB

▪ **Conducting the workshop**

The workshop was held on the 30th October 2014 at the premises of the Balearic Islands Coastal Observing and Forecasting System (Palma de Mallorca, Spain) from 9:45 to 11:15. Each participant was provided with supplementary information (i.e. AMP factsheet, a template for taking their notes, and a paper copy of the evaluation questionnaire) (Appendix VII and II). In addition, each one was equipped with a laptop for the hands-on session. The facilitator of the session was David March (WP6 Pilot case coordinator).

The workshop was divided into three main steps:

1) **Presentation of the AMP Toolbox** (15 minutes), carried out by the facilitator, where a general overview of the AMP Toolbox was provided together with information about general structure.

2) **Hands-on with the AMP Toolbox** (45 minutes), where each participant was asked to explore the different sections of the toolbox (having in main one specific policy issue of their election), and take notes in the provided template for further discussion. Participants were also allowed to comment and interact regarding specific issues that they found.

3) **Evaluation of the tool** (30 minutes), where a common discussion was conducted between participants first, and then followed filling the online questionnaire.

▪

Figure 9: Workshop room with supplementary material provided to participants (left), and one moment of the common discussion at the end of the session (right).

▪ **Main results from the workshop**

The facilitator of the session compiled the comments and suggestions of all participants by taking notes through the workshop sessions and by revising the

results of the online questionnaires. Main comments and suggestions are presented in Table 3.

Table 9: Comments obtained from Workshop.

Component	Comments	Suggestions
content	contents are very descriptive; target users were thought to be more suited to researchers than policy-makers. The big amount of text and literature was found to be more similar to a research style.	use more synthetic information initially; user more graphics as introduction for each section; and then allow accessing additional content if desired by the user
	it is no clear at all how steps and activities can contribute to adaptive policies	provide illustrative examples to better understand each part
	The use of deliverables, milestones and specific nomenclature of the project (e.g. WP number, or pilot case areas) was found a very negative aspect. Deliverables and milestones are documents for internal use of the project, and the target readers of such documents are not the same as the target users of the AMP Toolbox.	For example, for presenting the scenarios, the Table 12 of D6.2 could be used for summarizing the results.
	most of the literature is only accessible through subscriptions in research journals (not available for most of the policy-makers), and this could contribute on frustrating users for not being able to reach the contents of the Toolbox.	reduce references and focus on those sources that are open access or easily accessible. Keep more scientific and specific references for a technical document describing the tool, but not include in the tool itself.
	This initial page should have a header with direct and concise information about the goal of the website.	Add more graphics, mainly on the home page as presentation of the website
scope	stakeholder engagement is considered in different steps, however there is no clear specification about main types of stakeholders that should need to be involved in each step	identify different stakeholders categories and select their degree of involvement in the different steps and activities.
	Using the term toolbox may cause some confusion. Their first idea about a toolbox is some kind of decision support system that allows the user to insert information and then provide a response	they formulated a possible user case for the AMP Toolbox that could be possible given the information that is inside. Eig: 1) one policy-maker selects a policy-issue, one geographic region, and one governance level. 2) the toolbox provides him a summary for each step, a suggests which are the main activities and tools that could be used on each steps given their selected attributes.
	It is not clear what the toolbox provides and what do and do not.	A synthetic and more graphical explanation about the features of the AMP Toolbox should be provided in the home page
technical	stakeholders from non-English speaking countries may found some difficulties using the tool	A multilingual version of the tool would be more suitable for a broad range of stakeholder nationalities. It was acknowledged that with the big amount of content this task would be a major challenge. But if further versions provide more synthetic information, a multilingual support will be a nice feature.
	web template uses the same as Perseus website, and this have some aesthetical issues: size and text font were not considered optimal, the background photo, the limited space for the knowledge base search functions.	Consider using a custom design for the final version of the tool
	The search form should not submit automatically, since a user might want to filter for more than one field.	include a search button in each search form
	There is no FAQ section	Include a FAQ section

Component	Comments	Suggestions
	There is no contact form	include a contact form
usability	it is not easy to recognise what are all the activities considered in the toolbox; some of them are numbered in the top menu, but others not	in the description of each activities not number the activity on top menu (only for some) and use 'Activities' instead; create a page called 'activities' and provide an index of activities
	There is no sitemap of the AMP. Some pages do not appear inside a category	Include a sitemap

3.1.3. AMP Experimentation with policy makers (Bluefin tuna)

▪ **Introduction**

The objective of the AMP Workshop with policy makers was two-fold. First, present results of the BLUEFIN project and its potential contribution to support the design of pelagic marine protected areas. Second, use such case study to evaluate the web version of the Adaptive Marine Policy (AMP) Toolbox. The workshop provided the opportunity to the participants to get familiar with the structure and contents of the AMP, while generating useful feedback for further developments of the tool.

▪ **About the Workshop**

The workshop took held on the 12th December 2014 at the premises of SOCIB (Palma de Mallorca, Spain) from 9:00 to 14:00. Each participant was provided with supplementary information (i.e. AMP factsheet), and was equipped with a laptop for the technical session.

The workshop was divided into three main sessions:

Research reports, carried out by the organizing team in order to provide a general overview of the PERSEUS and BLUEFIN projects. A focus was given on the relation between ocean observing systems (PERSEUS WP3), modelling tools of Bluefin tuna (PERSEUS WP4) and the Adaptive Marine Policy toolbox (PERSEUS WP6).

Hands-on with the AMP Toolbox, where each step of the AMP Policy Cycle was assessed in regard to the particular case study. Relevant activities were identified and different resources of the toolbox were explored to assess their potential, adequacy and completeness.

Evaluation of the AMP Toolbox, where a general discussion between the organizing team and participants was conducted, and the online questionnaire was completed.

▪ **Participants**

The following list presents all the participants that attended the workshop:

Organizing team

David March, as PERSEUS WP6 member and facilitator of the workshop

Diego Alvarez-Berastegui, as BLUEFIN member

Patricia Reglero, as PERSEUS WP4 member and rapporteur

Invited stakeholders

Pilar Marin, Oceana

Josep Amengual, OAPN (Spanish Ministry of Agriculture, Food and the Environment)

Salud Deudero, IEO and CIESM

The workshop began with two presentations about PERSEUS and BLUEFIN projects. Both presentations can be found as supplementary material (Appendix V).

Bluefin Tuna project

The first presentation was from Diego Alvarez-Berastegui, about the BLUEFIN project. He made a special focus on spatial models of spawning habitats (Figure 2) and their potential applications in fisheries management. He provided an example from Australia (Hobday et al. 2010) which illustrates the concept of dynamic pelagic protected areas within the context of adaptive management in order to reduce Tuna bycatch. He mentioned that the key of its success is the multi-stakeholder engagement, including fisheries managers, scientists and the fishing industry as well.
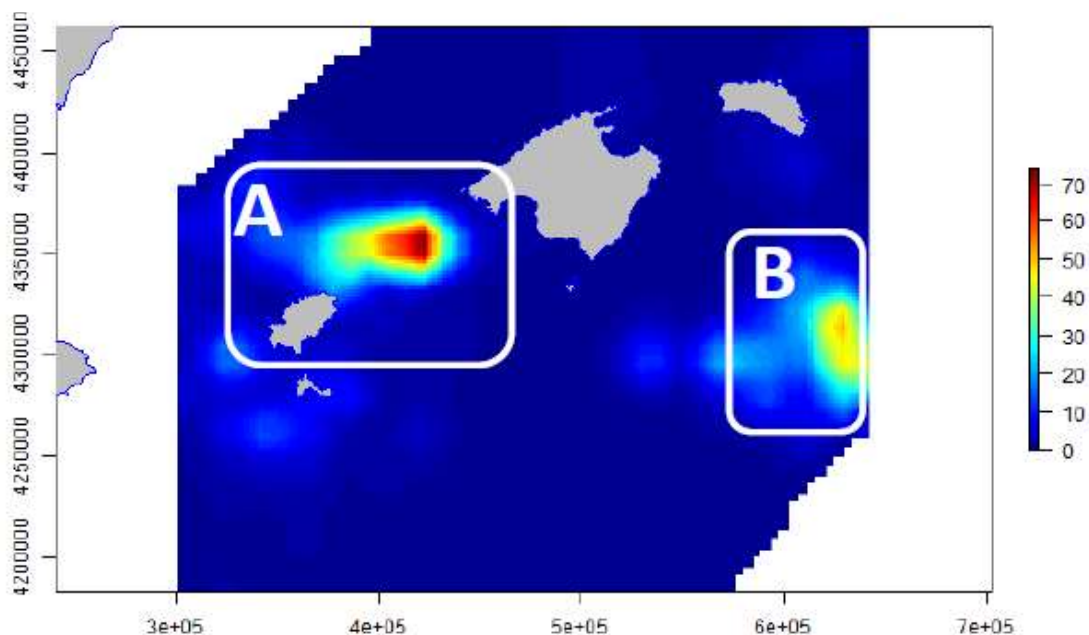
Figure 10: Predicted spawning habitat of Bluefin tuna for the year 2003.

Adaptive Marine Policy Toolbox

The second presentation was from David March, about the PERSEUS project and the AMP Toolbox. He presented the PERSEUS study areas and WPs structure. He established the link between different WPs within the context of the case study: WP3 working on observation systems with potential applications for fisheries (monitoring fishing activity with VMS and AIS, and remote sensing for inputs for the spawning habitat models); WP4 in line with Bluefin models; and WP6 within the framework of adaptive management. Then, he presented the rationale of the AMP Toolbox within the context of the MSFD and the need of establishing Programmes of measures by 2015 (Figure 3). He also provided an overview of the structure and contents of the AMP Toolbox.

Figure 11: Policy cycle of the Marine Strategy Framework Directive.

HANDS-ON WITH THE AMP TOOLBOX

David March presented an overview about each step and introduced different activities, tools and databases that could be linked to each one. It was explained that despite the broad themes targeted by the AMP Toolbox, the workshop will be focus on exploring the tool having in mind the case study of the bluefin tuna.

Step 1. Setting the scene

Three main points were assessed in this step: 1) defining the problem and the policy issue; 2) stakeholder identification; and 3) gathering existing information.

David March and Diego Alvarez-Berastegui suggested **defining the policy** issue as the overexploitation of the Atlantic Bluefin tuna. The spatial spawning habitat models

presented before could be used for designing pelagic MPAs in the Balearic Sea, similarly to Hobday et al. (2010). Some discussion was conducted about if the problem of designing a pelagic area should be the focus, but it was clarified that the problem of designing and establishing a MPA is the result of working in step 2 and step 3.

The activity about **involving experts and stakeholders was presented** with a two-fold objective. First, identify stakeholders for future meetings of the BLUEFIN project; and second, to assess the potential of the Institutional inventory for the identification of stakeholders (see box below).

Evaluation: Institutional inventory database

Query constructed:

"PERSEUS pilot case=West Mediterranean Sea" & "MSFD Descriptor=COMMERCIAL FISH"

Number of results:

10

Comments from participants:

- ICCAT is not found in the result list

- The national level is not well represented. MAGRAMA is identified for Spain, but at least having the Secretariat level will be more useful. The current information seems not helpful.

- Information about competences for each organization would be an asset

- Competences are also different if we account for the jurisdictional waters. Having this information in the tool would be very helpful.

- Using PERSEUS pilot case search criteria should be replaced at some point, since it seems it limits the applicability of the tool.

The final identification list generated by all participants included the following organizations:

- International tuna management: ICCAT
- Spanish government: MAGRAMA
- European Commission: DGMARE, DGENVI
- Research and monitoring: IEO, IFREMER
- International conventions/organizations: ACOBAMS, UNEP/MAP, RAC/SPA, IUCN
- Protected areas: MEDPAN, EBSAS (Convention on Biological Diversity)
- NGOs: Oceana, WWF, Bird-Life
- Jurisdictional issues: Universidad de Sevilla

The activity related with **gathering information** was presented, and the Research projects and marine valuation databases introduced. They are PERSEUS products and potential sources of information. The Research project database was assessed in-depth by constructing a sample query (see box below), whereas the Marine valuation database was explored briefly. Participants found a disagreement in nomenclature since the "Marine valuation" is referred as "Economic valuation" in the "Knowledge base" tab. This database was found useful by participants since economic valuations are generally lacking.

Evaluation: Research projects database

Query constructed:

"MSFD Descriptor=commercial fish species"

Number of results:

20

Comments from participants:

- The 'Free text' tool seems that is not working fine.

- National projects are missing, although it is recognized that doing this work for all countries may suppose a high amount of work. It would be interesting to suggest to European Commission to work on this issue and establish interoperable protocols to join efforts and databases.

- Participants suggested other projects that were not found: Medisah, Medseacan, Corseacan, Hermes.

- Despite its potential, participants commented that for our objective/case study the list of research projects is very poor.

Step 2. Assemble the basic policy

David March presented an overview of this step, and introduced two databases to be evaluated: the inventory of measures and the legal inventory (see boxes below).

A set of **current measures used for managing Bluefin tuna** was identified by Diego Alvarez-Berastegui as mentioned in his previous talk. Measures include TACs to different fishing modalities, minimum sizes and temporal closures. All of them are managed by ICCAT. However, such measures do not take into account environmental dependency, and for this point the spawning habitat models could play a key role.

Evaluation: Measures inventory database

Query constructed:

"Drivers=Fisheries & Pressures=Biological disturbance & Impacts=Selective extraction species"

Number of results:

24

Comments from participants:
- When clicking on one result, the header stands for "MEASURES INVENTORY **FICHE**".
- The filter criteria are based on a system of indicators (DPSIR) which is not clearly explained and related to the content.
- Titles of results are confusing and not clear.
- It seems is an inventory of responses rather an inventory of measures. Some outputs are not measures
- Results are not clear. For example, GFCM appears as a result, and this is not a measure.
- In overall, participants mentioned that this database does not seem useful for the identification of measures for the case study.

Evaluation: Legal inventory database

Query constructed:

"PERSEUS pilot case=West Mediterranean Sea & Link to MSFD GES Descriptor=Commercial fish"

Number of results:

12

Comments from participants:
- There is a duplicate for the same Spanish law. One register with name "Law 41/2010 of December 2009" is the same law as the register with the name "Marine Protected Area Network".

- Participants comments that there is a great complexity in legal issues, and assembling all relevant national and international legislation is a big challenge. In addition, the frequent modification of laws threatens the maintenance of the database. In addition, the content of the database seems poor for the case study. In overall, they suggested that it could be more useful for the AMP to provide a list of national and international legal repositories.

Step 3. Make policy robust

There was a discussion about the **differences between step 2 and step 3**. One participant mentioned that the text from the toolbox says "here is no univocal distinction between these two tiers (which makes it a bit arbitrary)". He suggested that a clear distinction should need to be done, and suggested the possibility of aggregating both steps into a single one.

Participants were asked about their experiences in **prioritizing and assessing multiple measures** as one key activity in both step 2 & 3. Participants mentioned they had experience in assessing multiple options through the definition of key indicators and criteria, and ranking management decisions and measures accordingly. Although no specific indicators were commented for the case study, participants mentioned that different aspects should need to be considered: legal feasibility, socioeconomic issues, and monitoring costs. In addition, the impact of each measure on different stakeholders should need to be considered as well.

About **considering uncertainties**, one participant mentioned that this issue is hard to take into account since it is difficult to get such type of information in advance. In real situations, it is more likely to account for unknown responses during the step 5. It was also mentioned that for step 3, a contingency risk analysis could be conducted.

Step 4. Implement the policy

One participant highlighted the importance of a **legal framework** for implementing the policy measures. Once a legal framework exists, then the management committee can implement the policy. In addition, different legal frameworks may be used for the current case study. For example, the designation of a marine pelagic area in Spain should be declared by a law, whereas a fisheries management measure is more likely to be declared by an order from the Ministry. In addition, the same legal framework can have different **competent authorities**. For example, the terrestrial national parks have been transferred recently to Autonomous Communities, whereas a marine park is competence of the OAPN.

A map of jurisdictional waters in the Mediterranean Sea was used to discuss about competences in relation to the hypothetical establishment of a pelagic MPA in the Baleric Sea (Figure 4).
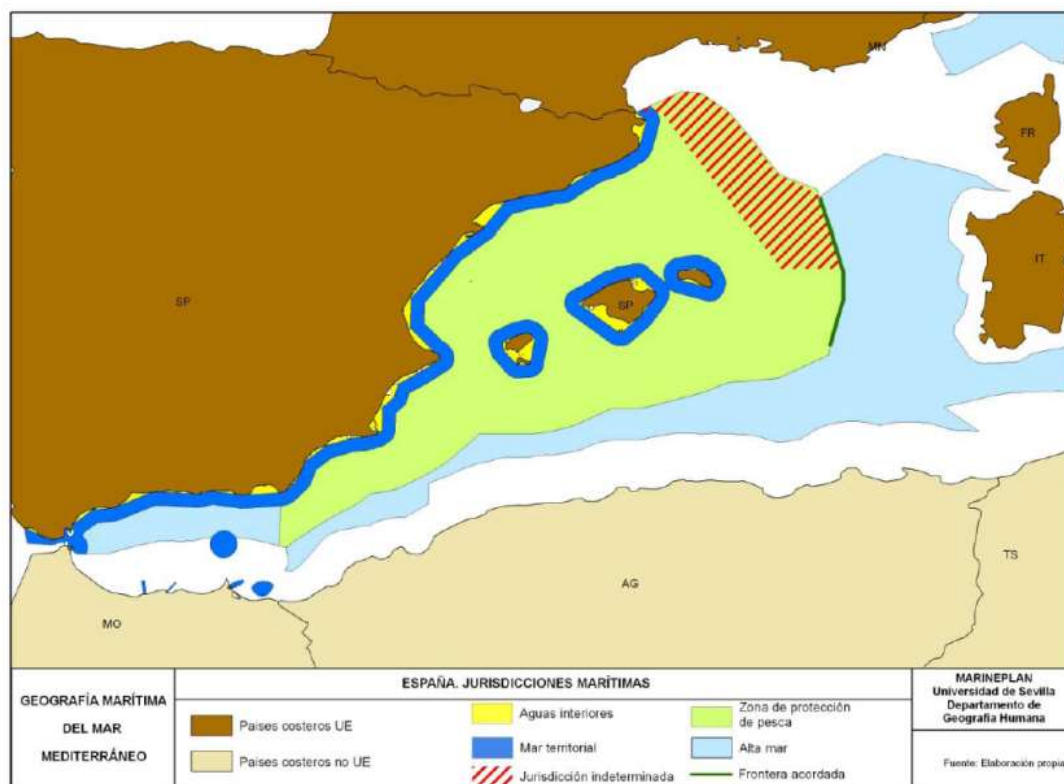
Figure 12: Jurisdictional waters in Spain (source: Suárez de Vivero et al 2009).

Step 5. Evaluate and adjust policies

Participants commented that results from a monitoring plan should need to be assess to evaluate the policy. A set of indicators should need to be defined according to objectives defined in step 1. Such analysis should be done not only to assess specific measures, but also the overall outcome.

Participants discussed about who should evaluate the policies. An independent panel was the best option. For example, one participant mentioned that in his organization (OAPN) there is a Scientific Committee for conducting external assessments.

There is a critical discussion about some of the selected tools for the key activity "Evaluate the ongoing policy". For example, it was commented that MARXAN and Habitat Priority Planner were designed for planning multiple zoning options, and not for evaluating the results of a policy. Therefore, it was suggested that the Tools database should need to be revised.

CONCLUSIONS, RECOMMENDATIONS AND NEXT STEPS

General remarks

General issues that were commented at different stages of the workshop are presented:

Incorporation of non-EU countries

There was a discussion about the inclusion non-EU countries in PERSEUS WP6 case studies that came during different moments of the workshop. This aspect can be very important when working in pelagic ecosystem. Several aspects motivated such discussions:

- The AMP Toolbox is currently in English only. In order to engage riparian countries from the southern basis, it should need to be translated at least into French.

- The WP6 pilot cases did not incorporate African countries and this point should need to be considered in further projects, although some participants recognized the difficulties that can be found when working with stakeholders from African countries (e.g., lack of resources).

- Some parts of the AMP make explicit references to the MSFD, which only affects EU member states. It would be interesting to incorporate the Ecosystem Approach Strategy (ECAP) since it affects all Mediterranean countries.

Jurisdictional analysis

This issue appeared in the discussion throughout different steps.

The identification of stakeholders raised the issue of complexity of jurisdictional issues at national and international levels. Information about EEZs and other

jurisdictional waters (like Fisheries protection zone in Spain) are very important. All that has to do with the management of marine pelagic species is that the species is not only in the EEZ.

About the tool

What is AMP?

There was an initial misunderstanding about what AMP stands for. In Spanish, AMP stands for "Area Marina Protegida" (marine protected area, MPA), which could bring to a misleading concept about the tool. In this sense, participants would have preferred to use the original APF acronym (Adaptive Policy Framework) rather than AMP.

The AMP policy cyle

The structure of policy cycle was commented by participants. Similar frameworks have a long tradition in adaptive management in terrestrial ecosystems and the AMP seems to translate it to marine ecosystems. One of the difficulties found to better understand what is the rationale of the different steps is the clarity of the text. Text was very descriptive and at some points rather unclear for participants.

A similar tool for guiding the design of MPAs (Pomeroy et al. 2004) was identified by one of the participants, and another recent guide for Marine Spatial Planning (Ehler 2014).

Knowledge base

In general, most of the databases were found clear enough to start searching for data, with the exception of the Measures database. This one was found unclear which discouraged participants about thinking about its potential. The adequacy and potential of the rest of the databases was found correct, although the major weakness was the content of the databases. In general, they were found to have poor content which was not useful at all for the specific case study of this workshop. In this context, one recent example about a MPA toolkit (http://www.mpaaction.org/) was provided by one of the participants.

Maintenance of the tool

Participants commented their concern in relation to the maintenance of those databases in the long-term and after the PERSEUS project will finish. As recommendation, a long-term strategy carried out at USA in order to support the sustainment of such kind of projects (http://www.lternet.edu/) was mentioned.

Online questionnaire

Participants were asked to fill the online questionnaire from the website. The responses are analysed together with the results from the rest of the Pilot Cases and reported in section 5 of this report.

1.2. AMP experimentations in the French part of the Western Mediterranean Pilot Case

3.2.1. Introduction

In this section, we will focus on the tests performed within the French part of Western Mediterranean pilot case area, presenting the results of the implementation and testing procedures within this pilot case.

Intermediate and high level policymakers -stakeholders from PERSEUS stakeholder platform- were selected for performing the tests. The procedure applied during the testing with policymakers is expected to enrich the experimentations through well documented and robust opinions from policymakers who participated also in the AMP planning procedure. This procedure consisted of the following three steps: (i) presentation of the AMP Toolbox; (ii) testing potential applications of the toolbox; and, (iii) feedback collection. Procedure followed during the tests, the participants in the experimentations and qualitative comments are described in the following sections. The quantitative data from these interviews is included in the filled online questionnaires. This info was integrated with data from all other case studies and depicted in section 5 of this report (Survey results).

3.2.2. Workshop with research staff

- **Selection of participants**

Nine stakeholders from different organizations participated into the procedure for the evaluation of the AMP Toolbox. The participants were selected according to their experience with the MSFD and/or their previous involvement in the development of science-policy applications (Table 4).

Table 10: List of the workshop participants.

Name	Job Title	Organization
Carla Murciano	Consultant	Freelance
Antoine Lafitte	Programme officer	PLANBLEU
Pierre Boissery	Expert	AERMC
Jean-Pierre Giraud	Programme officer	PLANBLEU
Yves Henocque	Senior adviser	IFREMER
Frank Fredefon	Programme Officer, Head	Inter-Regional Directorate at the Sea (DIRM Med)
Catherine Piante	Programme officer	WWF France
Denis Ody	Programme officer	WWF France
Christophe Le Visage	Consultant	Freelance

▪ **Conducting the experimentations- face to face interviews**

Interviews were implemented by Didier Sauzade and Julien Le Tellier:

- On the 30th October 2014 at the premises of the AERMC (Marseille, France) from 8:45 to 12:15

- On the 16th December 2014 at the premises of Plan Bleu (Marseille, France), from 9:00 to 11:00, and from 14:00 to 16:30.

Interviews were divided into three main steps:

1) **Presentation of the AMP Toolbox**

2) **Testing of the AMP Toolbox**

3) **Evaluation of the AMP Toolbox**

▪ **Main qualitative results from the experimentations and lessons learned**

Generally, the AMP Toolbox was assessed positively and it is expected to contribute effectively to the preparation and implementation of an integrated marine/maritime policy. Specifically, the AMP Toolbox will provide valuable guidelines to the involved managers and policymakers regarding how to implement an adaptive policy to their field of expertise.

Moreover, the utilization of AMP Toolbox will contribute to the confrontation of existing knowledge gap problem, which is obvious nowadays. Indicatively, the definition of the policy targets is performed without conducting a real assessment regarding the potential impact of these targets on the GES. One remark regarding PERSEUS policy cycle is the fact that it does not allow to identify gaps in order to achieve the GES – "*what is missing in your area, in the management of your area to achieve GES*".

"*We need new knowledge and actions of monitoring to adapt the initial policy*". "*The problem is that the scientific approach is the basis of the MSFD, but a framework directive is a binding instrument: it is not a research project! In principle Science should support Policy, and no the opposite* (…) *Needs of new knowledge have to be prioritized according to the most urgent (and taking into account budgets/resources available)*".

The AMP Toolbox will be probably most useful for the case of local managers and other stakeholders instead of the case of high level policymakers.

"*The AMP Toolbox is more useful for policymaking at intermediate level and for stakeholders in charge of 'everyday management' (namely local services of ministries, and above all specialized agencies dealing with sector policies and implementing measures and actions) than for high level policymakers. (…) NGOs could also be interested since they participate into adaptive and integrative management: civil societies can use (interpretation/translation of) scientific knowledge. (…) Adaptive*

management is close to "learning by doing" principle, involving all stakeholders – including civil societies and economic sectors".

The role of each group of users should be more highlighted in each step (not only mentioned) and the information targeting each group more precisely stated. This will distinguish which tools and information can be used by a specific type of user.

The provided information is clear and valuable in most cases. However, since a lot of information is given, it might be useful to specify the target group of each kind of information. Furthermore, special efforts must be given to synthesize information and to provide the most adequate one to each step of the toolbox.

Even if the structure of the AMP Toolbox is well defined, it is essential to clarify different objectives and processes in each separate step. It is crucial the Step 3 to be more clearly distinguished from Step 2. In addition, the tree-structure has as a result for the user to lose his track easily. In this case, the followed path should be presented so as to have a complete overview of the toolbox and the features.

The AMP Toolbox seems to be reliable regarding its technical performance, but some malfunctions should be repaired focusing on links that do not work and the lists with blank fields.

The databases are generally complete, but they can be improved especially during the filtering procedure. Regarding their contents, it is important to focus on the integration of indicators for the monitoring of the processes and tools for the assessment of the implementation, as well as tools for the assessment of costs of the measures and the estimation of the socioeconomic impact of the actions.

Finally, the presented examples are limited and could be more focused or adapted to each of the step rather than being general. For example, a more explicit link with other existing implementing strategy was suggested such as in the case of the ICZM Protocol (see PEGASO FP7 project). Furthermore, a brief justification for the selection of these examples must be presented.

Last but not least, it would be worth to promote the collective work on governance trajectory identification throughout time and in response to changes. In complement to 'Who should be engaged', the toolbox should develop 'Who should moderate and how' putting the emphasis on the necessary institutional arrangement through the evolution of the coordinating unit and its composition so that the policymaker understands that here the process is as much important as the outcome.

Interesting opinions by other policymakers include the following qualitative results:

- Adaptive management is useful for a given area/territory, taking into account the specificities of the territories (both natural and governance aspects).

- The issue is to deal in a balanced manner between conservation issues and development challenges (human activities, economic sectors).

- Adaptive management is close to "learning by doing" principle, involving all stakeholders – including civil societies and economic sectors. (But it is not the case for the time being regarding the MSFD implementation).

- Very often the objectives are well described, but not the mean of implementation and financing.

- Be careful regarding shopping lists in the AMP Toolbox: What are the limits in terms of number of tools, examples, case studies: at the end, that could be too full… So be realistic. Add only some examples.

- Adaptive management implies mid-term (and continuous) evaluation/assessment. Policy cycle of the AMP Toolbox is interesting, but all things/steps are not at the same level. In terms of dynamic, information is continuously developed (GIS for instance) as well as stakeholder participation and governance.

- Feedback about AMP Toolbox:

  o Very good to have defined 3 phases for (robust) preparation of the policy. A question has been raised about the duration of the Policy Cycle. Timing issue: it is difficult to define the good/right timing. 5-6 years seem a good timescale for a plan/action/measure (if more, then that is vision).
  o Very good in terms of references and existing documents available online.
  o Useful design. Very good in terms of technical aspects. Self-explanatory.
- Room for improvement of the AMP Toolbox:

  o Information aspects (regarding baseline situation)
  o Participation aspects: At what step? How? (Need for sociology and anthropology). Need for participation of all stakeholders to define/find compromise. Policymakers need supporter among stakeholders. The issue is how to change stakeholders' behavior from opponent to supporter. Need to have a governance framework at the level of the issue/problem tackled by the policy.
  o Need to better show iterative aspects.
- Glossary: good idea! One very simple, and another more detailed for each step.

- Additional Sources of inspiration were also suggested: Olsen and other literature regarding "orders of outcomes" and "changes of behavior".

  o https://wiki.csiro.au/confluence/download/attachments/368541761/Olsen+2003+Frameworks+and+indicators+for+assess+progress+in+ICZM.pdf

  o http://fr.slideshare.net/riseagrant/olsen-frameworks

Finally, regarding adaptive policy/management, some stakeholder statements seem particularly of importance, as follows:

'Actually local managers and policymakers make adaptive policies without using this expression of "adaptive policy": they decide, they implement actions/decisions, they assess the results of such actions/decisions, they adjust/adapt to recent developments and observations (taking into account new scientific evidence/knowledge). They have 'monitoring indicators' (indicators of objectives' achievement). The only missing part is that they define policy targets without developing a real assessment regarding the potential impact of these targets on the GES…'

'We already make adaptive policies without naming these policies as adaptive. We use often the DPSIR framework. Developed in the context of MSFD implementation, Action Plan for Marine Ecosystem (Plan d'Action pour le Milieu Marin - PAMM) for the French Mediterranean façade is clearly adaptive, asking for adjusting measures according to assessments of results'.

'Policymakers and managers define realistic/achievable/doable/feasible objectives/actions (according to sources of funding and technical aspects). That is different in comparison to scientific approach: scientists would like to know everything and everywhere, without considering costs… In the reality of the field, you can (you have to) decide in a context of uncertainties – without having the relevant knowledge. And that could be a strategic choice… The lack of knowledge has not to be a reason for not deciding! We don't know all on all and everywhere, but we have to act in this context'!

'High priorities are given to decision without possible regret. I decide in a context of lack of knowledge. I decide without having all knowledge. Then I am able to adjust and complete by taking new evidence coming later'.

'Need for tools allowing for assessing costs of measures and socioeconomic impact of actions'.

Best actions/measures according to stakeholders are these which:

'Are the less expensive. Are making scientists work. Mobilize all stakeholders (synergetic effects), particularly socio-eco sectors (e.g. fishermen). Improve the state of the environment. Fit the legal obligations (framework directives). Allows communication (marketing and mass media aspects). Have good results!'

1.3.   AMP experimentations in the Aegean- East Mediterranean Pilot Case

3.3.1. Introduction

This section presents the activities carried out in Greece (East Mediterranean Pilot Case) for testing the AMP Toolbox with different stakeholders in order to get their feedback and suggestions. Further developments of AMP Toolbox will be based on feedback received through these experimentations.

Two main activities were executed at the level of Pilot Case: 1) An experimentation-workshop with marine scientists dedicated to analyze the use of the tool, explore its usefulness and potential malfunctions; 2) In-depth AMP testing (in-depth interviews) with policy–makers marine environmental managers, using two specific case studies (offshore wind farm spatial planning and marine litter problems) for practical hands-on testing. The following sections describe the methodological approach and main results obtained in each one.

3.3.2. Experimentation with marine scientists

- ▪   **Selection of participants**

In order to conduct a practical hands-on session with the AMP Toolbox, marine scientists (mainly HCMR research staff) were invited. Participants were selected according to their familiarity with PERSEUS project and/or their previous involvement in the development of science-policy applications (Table 5).

After personal contact for confirmation regarding their availability, an invitation was sent via email to all the participants including a brief information note about the AMP Toolbox and the agenda of the workshop.

Table 11: List of the workshop participants.

	PARTICIPANT	JOB TITLE
1	**Dr. Christou Epaminondas**	Director of research, Biologist oceanographer
2	**Dr. Kaberi Helen**	Senior researcher, Chemist oceanographer
3	**Dr. Kontoyiannis Harilaos**	Director of research, Physicist oceanographer
4	**Dr. Michalopoulos Panagiotis**	Senior researcher, Geologist oceanographer
5	**Mr. Ntokos Ioannis**	Scientific officer, Programmer - analyst
6	**Dr. Panagiotidis Panayotis**	Director of research, Biologist oceanographer
7	**Dr. Pantazi Maria**	Scientific officer, Statistician oceanographer
8	**Mr. Papadopoulos Euripidis**	Administrate officer, (Master of Science in Services Management)

	PARTICIPANT	JOB TITLE
9	Dr. Pavlidou Alexandra	Senior researcher, Chemist oceanographer
10	Dr. Patiris Dionisis	Post-doc Fellow, Nuclear physicist
11	Dr. Tsangaris Catherine	Senior researcher, Biologist oceanographer
12	Dr. Velaoras Dimitris	Scientific officer, Physicist oceanographer
13	Dr. Zeri Christina	Senior researcher, Chemist oceanographer
14	Dr. Zanou Barbara	Scientific officer, Environmental economist
15	Dr. Papathanassiou Evangelos	PERSEUS project Coordinator, oceanographer
16	Prof. Skourtos Michalis	Facilitator to the workshop
17	Prof. Kontogianni Areti	Facilitating group
18	Dr. Tourkolias Christos	Facilitating group
19	Prof. Damigos Dimitris	Facilitating group

- **Conducting the experimentation with scientists**

The workshop took place on the 23rd October 2014 at the premises of the Hellenic Center for Marine Research (Anavyssos, Athens) from 9:45 to 14:30. As this was also the first testing of AMP Toolbox soon after its completion, it functioned as a pilot evaluation. Each one of the 15 participants was provided with supplementary information (i.e. AMP factsheet, a template for taking their notes, and a paper copy of the AMP evaluation questionnaire) (Figure 5). The facilitator of the session was Prof. M. Skourtos. Conveners to the facilitator were Prof. A. Kontogianni, Prof. D. Damigos, and Dr. C. Tourkolias (note taking, personal discussion with participants in the initiation phase and during the evaluation of the tool).

The workshop was divided into four main steps:

1) **Presentation of the AMP Toolbox** (25 minutes), carried out by the facilitator, where a general overview of the AMP Toolbox was provided together with information about general structure.

2) **Hands-on with the AMP Toolbox** (45 minutes), where each participant was asked to explore the different sections of the Toolbox (having in mind one specific policy issue of their choice), and take notes for further discussion. Participants were also allowed to comment and interact regarding specific issues.

3) **Oral evaluation of the AMP -discussion** (2 hours), where a common discussion was conducted among participants and various issues concerning AMP were raised.

4) **Written evaluation of the AMP** (20 minutes), during an informal discussion/ coffee break. The facilitator together with the 3 conveners explained the web-based

evaluation protocol, potential development of case studies and further suggestions for the AMP Toolbox.

Figure 13. Workshop room with participants.

▪ **Main results from the workshop**

The facilitating group compiled the comments and suggestions of all participants by taking notes through the workshop sessions and by revising the results of the online questionnaires. Main comments and *qualitative* suggestions are presented below. Further *quantitative analysis* of the AMP evaluation (after integration with the other Pilot Cases) was performed by the coordination team of Task 6.4 for the present Deliverable 6.13 and can be found on the last section of this Deliverable.

The main comments raised from the first AMP test, organized on Oct. 23, 2014, are the following:

1.   The length of the text is really long in some fields and constitutes a deterrent factor for the potential user. A shorter text was generally preferred providing a brief description of the subject, while a button "More" could navigate the user to additional information.

2.   There was a general comment regarding the layout of the AMP tool web pages. It was suggested, wherever possible and practical, to replace plain text with diagrams or flow charts displaying the necessary steps or with a graphical presentation of the main information with bullets, in order to make the tool more attractive.

3.   The definition of "adaptive" policy should be further clarified. For instance, the term "dynamic policy" was mentioned as a means to make the definition more clear. From a scientific point of view the term 'dynamic' is more relevant depicting the dynamic form of the policy making.

4. It is necessary to add more "best practice" examples and published papers in "Further reading" sections. This would enhance the scientific background of the toolbox and would improve its operationalism. Furthermore, it would be convenient to provide pdf files wherever possible.

5.   In several sections, e.g. "Tools", there are non-functional links within the toolbox. If there is a reason for that, it should be explained perhaps with a short explanatory text.

6.   In certain steps there are numerous proposed tools belonging to different categories (for example brainstorming, MARXAN, SWOT analysis, AMBI indicator are completely different to each other). Thus, the user easily becomes confused navigating through the tools. It was suggested to classify, rank or prioritize the proposed tools giving the user the opportunity to select the most suitable ones for his specific application. The evaluation can be based on the experience and the expert judgment of PERSEUS' partners.

7.   A brief description should be provided in addition to the link, especially in the "Tools" sections. For instance:

        MARXAN: (freely available conservation planning software, which provides decision support to a range of conservation planning problems)/ Ecopath with Ecosim (a free ecosystem modeling software suite), etc.

8.   Avoid using titles of specific projects and deliverables in link titles. These titles are conceivable only from projects' partners. Thus, the titles of existing links should be changed. For example: In "Regional models" section the title of the link "Scenarios to be modeled Extract for deliverable D.4.2 "should be renamed to "Modeling Scenarios". In "Regional Assessments" section, instead of "Analysis of the main risks of non-achievement of the GES, by the WP1 (open sea) and WP2 (coastal areas)", the tile of the link could change to "Analysis of the main risks of non-achievement of the GES in the Mediterranean and Black Seas"

9.   Similarly, there is no need to have two different links prior to opening the pdf file (e.g. In "Regional Assessments" section when clicking on the "Analysis of the main risks of non-achievement of the GES, by the WP1 (open sea) and WP2 (coastal areas)" link a new window opens with a new link "Milestone M17, Identification of the socio-economic issues to be treated within PERSEUS" that opens the relative file.

10.   The toolbox seems to be more "educational" than "operational". It is vital to focus mainly on the implementation of policies and on corresponding methodologies and tools.

11.   The use of links relating to specific research projects is a little bit risky. It is known that project web pages are not functional forever. The functionality of the provided links should be checked on a frequent basis.

12.   No link exists for certain cases (e.g. the case of Marine Scotland toolbox.) Include such links to convene the policy maker.

13.   It would be more convenient if the right-sided column (i.e. "About the AMP toolbox, Policy cycle, Step 1 etc.) automatically scrolled down, following the user.

14.   In order to avoid any misunderstandings regarding the aim and the target group of AMP Toolbox, perhaps it is necessary to add in the first page, i.e. "About the AMP Toolbox", a distinctive section labeled "To whom is it addressed" and probably a section "Do's and don'ts" to clarify the use of the tool.

Figure 14: Questions during the AMP evaluation.

3.3.3. Experimentations with policy makers

Two different policy makers participated into the procedure with the in-depth interviews for the case of Greece.

The description of these interviews is performed in the following sections.

❖ **Policy maker A**

▪ **Selection of participant for the first Greek AMP in-depth interview**

A senior consultant from the General Secretariat of Energy and Fossil Raw Materials, which administratively belongs to the Ministry of Environment, Energy, and Climate Change, was selected to participate in the first in-depth interview for the case of Greece. The General Secretariat of Energy and Fossil Raw Materials is responsible for the implementation of the energy policies in Greece including the further penetration of offshore wind parks. Even if it was recognized the fact that no direct relation and experience exist with the implementation of MSFD, the installation of offshore wind parks and the triggered impacts on the marine environment are considered as representative case studies for the implementation of the MSFD and the utilization of the AMP Toolbox. A direct link to Offshore Wind Farm Parks marine spatial planning in Greece was identified as a potential application of AMP Toolbox.

The arrangement of the interviews was performed after a phone discussion informing the policy maker about the project and the AMP Toolbox. The first meeting was mostly dedicated to brainstorming, through which the aim of this evaluation was set. Finally, an email was sent one week before each meeting in order to remind and confirm the interview.

▪ **Conducting the in-depth interviews**

The interviews with the policy maker A were conducted on the 14th and 28th November 2014 in the premises of the General Secretariat of Energy and Fossil Raw Materials in Athens from 13:30 to 17:30. Supplementary material was given to the policy maker including the AMP factsheet and a copy of the evaluation questionnaire. The presentation of the AMP Toolbox and AMP application was performed through the policy makers' personal computer.

The conduction of the in-depth interview included the three following steps:

I. **Presentation of the AMP Toolbox** (50 minutes)

The presentation of the toolbox was carried out by the facilitator, providing a general overview of the toolbox and presenting briefly a hypothetical case study focusing on the implementation of all the steps of the policy cycle as proposed by the AMP toolbox. The selected hypothetical case study focused on the confrontation of the problem of the noise, which is generated by the operation of the offshore wind parks and on the alleviation of the significant triggered impacts on the marine species.

II. **Discussion about the AMP Toolbox** (65 minutes)

In the second section, a fruitful discussion was taken place analyzing the main advantages and disadvantages of the AMP Toolbox as identified for the policy maker's point of view during the presentation of the hypothetical case study.

III. **Evaluation of the tool** (25 minutes)

Finally, the policy maker completed the online questionnaire, while some additional questions and comments were discussed before the closure of the interview.

▪ **Main qualitative results from the in-depth interview with policy maker A**

The general derived outcome from the evaluation procedure was the conclusion that the AMP Toolbox can be considered as a very useful and necessary tool enhancing the capabilities of the policy makers in the field of energy planning in the marine environment.

According to his assertions, an essential strong point of the AMP Toolbox is the provision of detailed information, while the provided information can be assessed as valuable especially for someone, who does not have any significant previous experience with the implementation of the MSFD and the related issues. This is the case with energy policy makers implementing marine spatial planning as in the case of Offshore Wind Farms.

As Policy maker A mentioned, it is crucial the provided information to be organized in a more efficient structure in order to be utilized by a policy maker immediately. He claimed that for his case it will be beneficial firstly to be informed about the examined problem and the requirements of the MSFD and then to proceed to the planning and the implementation of the most efficient policies selecting from the AMP Toolbox the necessary methodologies and tools.

Furthermore, he admitted that he would prefer the holistic confrontation of the examined problem from the AMP Toolbox, but he recognized the difficulties of this approach. Nevertheless, he supported the statement that it is necessary to present the necessary steps and activities in a more simplified and clarified way in order to facilitate the implementation of an adaptive policy.

To this direction, he acknowledged the fact that the potential integration of case studies and examples will increase the effectiveness of the toolbox and will help the potential policy makers to become more aware and productive.

The resource section was proved very interesting to him and admitted that this provided information is valuable for the development and the implementation of the most efficient methodology.

Nevertheless, he highlighted the necessity to improve the visual presentation of the provided information and to increase the user-friendliness of the AMP toolbox generally.

Finally, he claimed that the support section must be improved significantly giving the opportunity to the potential policy maker to resolve potential malfunctions and questions about the toolbox immediately avoiding the waste of time and resources.

❖ **Policy maker B**

- **Selection of participants for the second Greek AMP in-depth interview**

The second in-depth interview with policy makers in Greece towards evaluating the Adaptive Marine Policy (AMP) Toolbox was conducted with a senior policy maker from the Special Secretariat for Water (SSW), which administratively belongs to the Ministry of Environment, Energy, and Climate Change. The SSW is responsible for the development and implementation of all programs related to the protection and management of the water resources of Greece and the coordination of all competent authorities dealing with the aquatic environment. The SSW is composed of four Directorates and is headed by a Special Secretary, appointed by the Ministry of Environment, Energy and Climate Change. The Secretariat is responsible, among others, for the implementation of the MSFD and Water Framework Directive and is included in the PERSEUS Stakeholder Platform.

The first interview was arranged after informing the policy maker about the purposes of the meeting (i.e. presentation and evaluation of the AMP Toolbox) and was confirmed via emails two days before the interview.

- **Conducting the in-depth interviews**

The in-depth interview was conducted on two different days (November 14th and December 12th, 2014) in the premises of the SSW in Athens. The first meeting lasted about two hours (between 12.30 and 14.45) and except from the interviewee (i.e. the senior policy maker from the SWW) it was also attended by an external consultant of the MSFD Secretariat and another member of the SWW. This first meeting included the following sections:

I. **Presentation of PERSEUS project** (15 minutes)

   The presentation was carried out by the facilitator, providing a general overview of the project (aim, scope, progress, etc.) focusing on the connection with the MSFD.

II. **Presentation of the AMP Toolbox** (60 minutes)

   The presentation was carried out by the facilitator, providing a general overview of the toolbox. The presentation of the AMP Toolbox was performed through the AMP Toolbox webpage using a personal computer and a projector. The presentation was focused mainly on the concept of the 'Adaptive Policy Making' and the five steps of the policy cycle proposed by the AMP Toolbox. For each and every step the main sections were presented (e.g. 'What is this step about?', 'Why is this step necessary?', 'How should this step be carried out?', etc.). Particular attention was given to the additional information provided (e.g. tools and methods included in 'Key activities', 'Further reading', etc.). Finally, a more detailed presentation was provided for the AMP Toolbox Resources.

III. **Discussion about the AMP Toolbox** (60 minutes)

   In this section, a fruitful discussion took place analyzing the main characteristics of the AMP Toolbox from a policy maker's point of view, as well as the main advantages and disadvantages that were identified by the

attendees. In addition, supplementary material was given including the AMP factsheet and a copy of the evaluation questionnaire. The rest of the discussion was constructed around issues of how to perform the evaluation of the AMP Toolbox. The facilitator proposed two alternative ways in order to gain further insights and to evaluate the usefulness of the tool: the design of a 'general' roadmap towards implementing the MSFD or the design of 'tailor-made' policies using specific MSFD Descriptors as case studies, namely the Descriptors D5 (Eutrophication) or D10 (Marine Litter). The attendee argued that the first alternative would be more convenient. In addition, it was noted that the evaluation of the tool should be carried out on a comparative basis, i.e. 'with' and 'without' the use of AMP Toolbox. After that, a second meeting was decided, giving sufficient time to allow policy maker search, use and get familiar with the tool.

The second meeting was arranged about a month later and focused solely on the evaluation of the tool. It lasted about one hour and a half (between 13.00 and 14.30). Within that time, the policy maker completed the online questionnaire, while some additional questions and comments were discussed before the closure of the interview.

- **Main qualitative results from the in-depth interview with policy maker B**

The general outcome derived from the evaluation procedure was that the AMP Toolbox can be considered as a very useful and necessary tool addressing the main questions on the particular demanding aspect of marine policy-making in the context of the MSFD. The policy maker mentioned other tools used in marine policy issues and concluded that the AMP Toolbox is considered to be the most integrated one.

As regards the 5-step adaptive policy-making framework, it was reported that these steps are already known to experienced decision-makers; however, it is quite useful the fact that the steps are presented in a concise manner. According to the policy maker's comments, a strong point of the tool is that it attempts to include all necessary info around the issue, which is a quite demanding task. The provision of information is detailed and valuable especially for those not having significant experience with the implementation of the MSFD and the related issues. However, it was mentioned that it would be valuable to include suggestions/reports on dealing with existing knowledge gaps, which represents one of the major difficulties faced by marine policy- and decision-makers. In addition, it was argued that the tool may seem complex (especially to elderly policy- and decision makers) requiring some time to get familiar with. Thus, it was suggested to improve the visual presentation and to increase the user-friendliness of the AMP Toolbox. Towards the same direction, it was noted that the information provided should be organized in a more efficient structure (e.g. it would be more convenient to shorten the display of full text).

It was claimed that it would be beneficial for policy-makers to include more information and guidelines on how to develop scenarios (Step 1 – Key Activity 4), although it was recognized that specialized knowledge may be needed. Furthermore,

it was acknowledged that the inclusion of case studies and examples (both successful and failure), especially from European countries would certainly increase the usefulness and the effectiveness of the toolbox and would help the users to understand the problems and redefine their strategies.

Particular mention was made of the usefulness of the 'Resources' section. It was told that this section provides interesting and particularly valuable information, even to experienced policy-makers, in the context of the MSFD, e.g. the ability to select measures from the 'Policy Measures' database or to estimate monetary values for cost-benefit analyses of measures from the 'Marine Valuation' database.

Finally, regarding technical aspects and user interactions the comments were generally positive.

1.4. AMP experimentations in the Western Black Sea Pilot Case

3.4.1. Introduction

In this section, we focus on the tests performed within the Western Black Sea pilot case, presenting the results of the implementation and testing procedures within the Western Black Sea pilot case.

Two groups of stakeholders were selected for performing the tests. However, the procedure applied during the testing with the two groups was the same and consisted of the following three steps: (i) presentation of the AMP Toolbox; (ii) presentation of an example of application of the toolbox; and, (iii) feedback collection. The application of this structured and well-defined procedure, made possible the comparison of the feedback provided by the stakeholders.

The procedure followed during the tests, as well as the participants in the experimentations are described in the following sections.

3.4.2. Experimentations

▪ Planning the experimentations

The development of the experimentations in the Western Black Sea pilot case was a common effort of BSNN and BC3. The materials used during the implementation of the testing were produced by Maialen Garmendia (BC3) in consultation with Aleksandar Shivarov and Emma Gileva (BSNN).

A "Briefing for testing the AMP Toolbox at Pilot Case level" was prepared (see Appendix I) to plan and disseminate the procedure for the testing phase. This procedure consisted of three steps:

- ✓ Brief presentation on the structure, objectives and functionality of the AMP Toolbox (Appendix V). This included two sub-steps. Firstly, a brief power point presentation was shown to the participants in order to explain the fundamentals and the structure of the AMP Toolbox. Second, an online tour

was performed to show the way the AMP Toolbox works on the PERSEUS website.

✓ Presentation of an example or a storyline of an issue at risk of not achieving or maintaining Good Environmental Status in order to demonstrate how the different steps, key activities and resources within the AMP Toolbox could be applied.

The preparation of the second step (i.e. examples or storylines) was particularly laborious, since it required to: (a) compile information on the issue in question; (b) apply the different steps, key activities and resources to the issue in question; and, (c) present all the information in a friendly and easy to understand manner.

For the Western Black Sea pilot case two examples were developed, since the scientists and policymakers that were interviewed had different backgrounds and fields of interest. The examples covered the following topics: (1) the overexploitation of turbot stocks in the Western Black Sea (Appendix V); and, (2) the case of eutrophication in the Western Black Sea (Appendix V).

✓ Collection of stakeholders' opinions and suggestions on the AMP Toolbox through a questionnaire developed by AEGEAN and structured interviews.

▪ **Selection of participants**

Since the experimentations were organised by two spatially distant organisations, the testing took place in Bulgaria and Spain. Two groups of participants were targeted: scientists with prior experience in the Southern European Seas, including the Black Sea, based in Spain; and Bulgarian researches and policy makers, directly involved in the implementation of the MSFD in the Western Black Sea area. The two groups were selected based on their experience and knowledge of the MSFD implementation process, including seven stakeholders from five different institutions in order to perform the tests and thus obtain their feedback from the AMP Toolbox. The groups were organised as follows:

✓ Group 1: This group consisted of four scientists with experience in the Southern European Seas and/or experience in supporting decision-makers in the decision-making process regarding coastal and marine ecosystems. The objective here was to make a first trial of the AMP Toolbox as well as of the testing procedure itself.

✓ Group 2: This group consisted of two scientists working on the Western Black Sea and with deep knowledge and understanding of the area, as well as with a strong background of supporting policymakers in the decision-making process regarding Black Sea´s coastal and marine ecosystems. **Two policymakers**, representing the MSFD competent authority in Bulgaria

were also interviewed. All of the participants in this experimentation are members of the Western Black Sea stakeholders' platform.

The overall objective was to ensure different perspectives and backgrounds to obtain an integral feedback of the different components of the AMP Toolbox. Once the participants were selected, an email of invitation was sent to the potential participants (Table 6) together with the "Briefing for testing the AMP Toolbox at Pilot Case level" to explain the abovementioned three-steps procedure.

Table 12: List of participants in the experimentations.

Participant	Job title	Organization	Date
Group 1			
Irati Epelde	Junior researcher	AZTI-Tecnalia (Spain)	5th November
Nagore Zaldua	Pre-doctoral researcher	AZTI-Tecnalia (Spain)	5th November
Elena Ojea	Research fellow	BC3 (Spain)	6th November
Federico Cardona	Postdoctoral researcher	BC3 (Spain)	6th November
Group 2			
Vesselina Mihneva	Research fellow	IFR (Bulgaria)	21st November
Daniela Toneva	Associate professor	TU-Varna (Bulgaria)	22nd November
Stela Barova	Senior expert	BSBD (Bulgaria)	16th December
Silvena Gospodinova	Senior expert	BSBD (Bulgaria)	16th December

▪ **Implementation of the experimentations**

A total of five workshops / interviews, involving five researchers and two policy makers, took place at different institutions between the 5th of November and the 16th of December (Table 6).

Within Group 1, two workshops were carried out at AZTI-Tecnalia and at the Basque Centre for Climate Change (BC3), including two participants respectively. The workshops were facilitated by Maialen Garmendia (BC3).

Within Group 2, two interviews were held at the Institute of Fishery Resources (IFR) and at BSNN premises with a researcher from the Technical University - Varna (TU-Varna). A workshop with experts, responsible for marine waters, was organised at the Black Sea Basin Directorate. These experimentations were organised and conducted by Emma Gileva and Aleksandar Shivarov (BSNN).

The workshops and interviews were held for approximately one hour and a half. Each participant was asked to fill in the questionnaire either online or on paper. Apart from presenting the material described above, the respondents were provided with a leaflet on the AMP Toolbox (see Appendix VIII). According to the described plan the workshops were carried out in three steps:

Brief presentation of the AMP Toolbox (20 min): The leader of the workshop gave a brief presentation on the AMP Toolbox. First, the AMP Toolbox was put into context with special emphasis on what is the AMP Toolbox, for whom and why it has been developed and how it is applied. Second, the presenter led an online tour through the AMP Toolbox in order to present and clarify the structure and functioning of the toolbox.

Presentation of an example or a storyline (30 min): The leader of the workshop presented an issue at risk of failing to achieve or maintain the Good Environmental Status in the Western Black Sea. In the workshops organised with Group 1 (at AZTI-Tecnalia and BC3) and the interviews with Group 2 (IFR and TU-Varna) the case of turbot overexploitation was employed. Through the turbot case as an example, the application of different steps, key activities and resources was presented. Finally, for the interview at BSBD the case of eutrophication was employed.

Collection of opinions and suggestions of stakeholders (30 min): First an open discussion was performed with all the participants in order to make general comments and suggestions. These suggestions were noted by the facilitator. Moreover, the participants also had the opportunity to make this kind of suggestions along the whole process. Finally, the participants were asked to fill the questionnaire developed by AEGEAN.

- **Lessons learned, proposal for AMP Toolbox improvements**

The overall reaction of the participants in the experimentations to the AMP Toolbox has been positive. They approved of the attempt to introduce adaptive policy making approaches in the decision-making process on the marine environment. The wealth of resources included in the toolbox has been also appreciated. A major weakness appears to be the structuring of the information into multiple levels that makes the application of the step-by-step policy cycle complicated and opaque for the user.

Looking at the different aspects of the toolbox, the Content and the Technical aspects were the components with the highest rating, indicating the high value of the contents and information provided within the toolbox, as well as the effective performance of the interactive features of the toolbox. Though, some respondents pointed out that although the contents were valuable, the structure was not always clear, logical, and understandable to the user.

The component dedicated to User interactions showed lower scores as the respondents did not find it easy to access the sources provided in the tool and it has not been categorised and organised in an efficient manner. The Scope of the toolbox showed particularly low scores as a consequence of low comprehensiveness,

attraction and motivation. In addition, although the respondents generally agreed on the fact that the toolbox is useful to policymakers involved in MSFD implementation, they found the toolbox ineffective for this target group, as a consequence of the way the features are presented. In fact, only one respondent agreed that the target of the tool is well defined and clearly explained to the user.

Finally, the component with the lowest score was the Support, since currently there is no supporting material (e.g. guidelines, user manual or examples of application) available.

Many participants emphasised the need to popularise the toolbox and introduce training sessions or modules within it that can help self-learning.

Important comments and suggestions provided by the respondents are summarized in Table 7.

Table 13: Comments and suggestions provided by the participants in the experimentations.

Group	Component	Comments	Suggestions
1	appearance	Make the menu on the right more intuitive.	For example, showing the key activities within each step through a drop-down list.
1	appearance	Resources have a lot of information that it is not necessary for the policymakers such as the number of the deliverable or the information about the work-package that has produced the information, assessments or results in question.	Clean the titles and the unnecessary information particularly on the regional models and assessments.
1	appearance	In general it has a very scientific appearance.	Do not include so many references and literature. Make the appearance simpler and more attractive.
1	content	The activities should be clearer. It should be more intuitive to go from a step to the respective key actions in order to accomplish the step in question.	In the main menu in the right, make drop-down list with the respective key activities.
1	content	It is not necessary to know about the different types of resources whether they have been developed within Perseus or not.	Include all the resources within each key activity without distinction among types of resources.
1	content	When to arrive to the webpage it is difficult to identify the key information such as the objective, structure and potential users of the toolbox.	In the main page include briefly the information on "What", "Why", "How" and "Whom".
1	content	Examples are not examples of the application of the toolbox, it is misleading.	Actual examples should be within resources as further readings for example readings. And examples where the toolbox is applied should be included in the examples section.
2	content	Legal inventory for the Black Sea is a useful tool not encountered before.	The toolbox and its resources should be popularised among decision-makers.
2	content	Institutional inventory is redundant; and the inventory of measures repeats numerous similar exercises in EU marine related projects.	An added value for these databases would be to have links to sources of data that might assist decision makers in forming policies.
2	content	Some standard references necessary for taking decisions (e.g. on fisheries) are missing.	Need to include more links to reference literature on commercial fisheries.
2	content	The risk analysis (consequence x likelihood matrix) does not take into account possible thresholds in the development of non-linear process.	In Step 1, in addition to the risk matrix, an impact diagram could be useful for policymakers.

Group	Component	Comments	Suggestions
2	content	The multiple levels within the resources section confuse users and make it difficult to find the necessary information.	Improve the structure of the toolbox
1	other	The toolbox has a very high potential, though it is difficult to find it.	It should be more promoted and given higher prominence in the PERSEUS webpage, maybe in a separate webpage.
1	scope	Make clear that there is no need to follow the whole cycle or the 5 steps.	Make an initial statement where you indicate that a step should be selected.
1	scope	Make it catchier and simpler	In the main page include an statement like "Design your adaptive policies is 3 phases: select your step, key activities and resources!"
1	scope	It is not clear nor intuitive the structure of the levels of the toolbox	In the first page explain the 3 levels of information and show a clear navigation path starting from the steps, through the key activities and up to the resources and examples.
1	scope	There is too much text within the main panel of the left.	Within each step, key activity or resource leave only the heading of the section and show only the whole text when you click on the heading. For example, for a given key action, in the left panel, show only the headings that say "Introduction", "Key questions", "Key actions" and "Resources"; and show the text when you make a click in the respective heading or like a new tab or link.
1	scope	It is difficult to visualize the results or outputs of the toolbox.	Some examples should be included in order to see what type of output could be obtained from the toolbox.
2	scope	The adoption of adaptive management is a very positive approach for introducing good practices to the authorities responsible for the marine environment.	The toolbox should be presented to a wider group of stakeholders.
2	scope	The methodology has not been sufficiently adapted to the requirements of marine policy.	The application of toolbox should reflect the interconnectedness of issues (e.g. state of fisheries (turbot) and bottom integrity).
2	scope	It is easy to lose track of the activities that have to be completed for the design of a policy.	A checklist approach is suggested for streamlining decision-making for officials working in the public administration.
1	technical	The knowledge base is one of the most valuable things and it is not easy to found.	Resources and particularly databases should be more accessible.
1	technical	There is no way to make a question or comment unless you fill the questionnaire.	A direct contact to make specific questions and comments should be included.

Group	Component	Comments	Suggestions
1	usability	It is easy to get lost and know which steps you have followed to reach the actual page.	Include a line with the steps you have followed to reach to the actual page on the top of the page.
2	usability	A general impression is that the navigation is not user-friendly and there are breaks in the logical consequence of steps, particularly when the user has to jump between a policy step and resources related to it.	The navigation of the site should be improved and made more transparent.
2	support	Apart from the questionnaire, there is no direct link to the administrator such as an e-mail of contact or a feedback field.	There should be a link or a way of contact apart from the questionnaire to make any query or different suggestions.

1.5. AMP experimentations in the Northern Adriatic Pilot Case

3.5.1. Introduction

Testing exercise is aimed at verifying the capacity of the AMP Toolbox to support the development of robust and coherent adaptive policies designed for overcoming situations at risk of non-achievement the GES during the 2020-2030 horizon, through a participative approach involving regional stakeholders and relevant experts.

In this context, within the North Adriatic sea Pilot Case this exercise is being implemented through two main activities: 1) face to face interviews with relevant experts in the field of marine sciences; 2) focus groups with local stakeholders from the three countries of the North Adriatic sea case study area (Italy, Slovenia and Croatia). These focus group will be organized in the form of role-playing game (RPG) including an adequate number of stakeholders involved in implementing the MSFD and developing adaptive policies within marine areas, focusing on topic related to their background in order to get their active and motivated involvement.

Until now, the activities for testing the toolbox by means of focus group with local stakeholders are in the planning stage, scheduled for the beginning of 2015. However, interviews with experts have been concluded providing valuable feedbacks and suggestions for improving and simplify the understanding and use of the AMP Toolbox by potential end-users. The main objective of this report is to present the methodological approach and main results obtained by this first activity carried out in Italy for testing the AMP Toolbox, underlining emerged comments and recommendations.

3.5.2. Workshop with research staff

- **Selection of participants**

As far as 'face to face interview' is concerned we selected a reduced number (2) of experts from the Ca' Foscari University of Venice in order to present them the AMP Toolbox functionalities. During the presentation a realistic situation (Saronikos Bay) [1] has been used in order to illustrate the functionalities and potential uses of the toolbox. More details about the case study are presented in Appendix VI.

Participants were selected according to their knowledge about the PERSEUS project and their previous involvement in the implementation of the MSFD objectives in the North Adriatic sea Pilot Case (Table 6).

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[1] The case study had been developed by members of the team CMCC on the basis of data and information provided by colleagues from HCMR.

Table 14: List of the -face to face interview- participants.

Name	Job Title	Organization	Experience
Roberto Pastres	Associate professor	University Ca' Foscari of Venice	MEDINA project,
Stefano Soriani	Associate professor	University Ca' Foscari of Venice	PEGASO project

- ▪ **Conducting the workshop**

The interview took place on the 26th November 2014 at the premises of the University Ca' Foscari of Venice (Venice, Italy) from 15:45 to 17:15. Each participant was equipped with a laptop in order to provide direct access to the toolbox available tools in the AMP Toolbox for each step of the AMP. Moreover, a paper copy of the evaluation questionnaire was provided to them at the end of the interview.

The interview was divided into three main steps:

1) Presentation of the AMP and related AMP Toolbox (30 minutes)

This first step was carried out by the facilitator, where a general overview of the AMP Toolbox was provided together with information about general structure of the AMP in order to better explain contents and scope of the toolbox.

2) Presentation of tools and methods supporting adaptive policy making in marine areas (30 minutes).

Following the iterative steps of the AMP some tools and methods, previously selected from the AMP Toolbox as relevant for the considered case study (Saronikos Bay), have been presented underling how they can support decision makers in draw up marine environmental policies. Participants were also allowed to comment and interact regarding specific issues that they found during the presentation.

3) **Evaluation of the AMP Toolbox** (30 minutes).

In this last step a common discussion was conducted between participants and facilitators in order to collect their feedback and suggestions about the AMP Toolbox.

- ▪ **Main results from the workshop**

The facilitator of the session compiled the comments and suggestions of all participants by taking notes through the interview. Main comments and suggestions were summarized in five thematic areas (i.e. scope, content, technical, usability and general remarks) and are presented in Table 9. Further analysis and integration with other Pilot Case will be performed by the coordination team of Task 6.4 for Deliverable 6.13.

Table 15: Comments obtained from Workshop.

Component	Comments	Suggestions
scope	Scope of toolbox is clear and tools and methods collected are well linked with the steps of the AMP which follows the step-by-step structure of the project cycle reinforced with the concept of adaptive planning and management.	
	Using the term toolbox may cause some confusion. First idea about a toolbox is some kind of decision support system that allows potential end-user to use specific datasets from the toolbox, focused on a specific case study, for getting a response/measure.	
content	The focus on potential end-users (policy makers, scientists, technician). Some tools require high expertise, while others can be used by any end-user acquainted with policy making. The high level of expertise requested by some tools could represent a critical issue.	
	The AMP Toolbox is not aimed at providing environmental dataset to support the analysis of a specific issue/case study. However, tools can support SHs and decision makers in adaptive policy making, provided that dataset are already available.	Provide link to relevant dataset about natural and human-made pressures in marine areas (e.g. time series, spatial data, numerical model, data from survey and monitoring programme) able to support a screening analysis of interactions and synergies between the different components of the marine ecosystem.
	Toolbox includes heterogeneous tools (e.g. DSS, GIS tools, frameworks and methodological approaches) and for a potential end user can be hard to select the best tool for a specific AMP step.	
technical	Some terminologies used within the AMP Toolbox can be interpreted in very different ways according to the scientific background of the end-user. For instance, inventory of measures could be interpreted as a collection of data from survey or monitoring (measurement) programme.	Terminologies used within the AMP Toolbox should be detailed in a glossary aimed at explaining meaning and avoiding misinterpretation.
usability	For a typical end-user it might be difficult to select a tool rather than another within a specific step of the AMP.	
general remarks	Several toolboxes have already been implemented within other European projects (e.g. PEGASO); unfortunately, at the end of the project very few of them are maintained / available for further end-users.	Plan long-term sustainability and availability (web based) of AMP Toolbox.
	Reinforce the concept of 'adaptive policy making' (loop of the AMP –policy cycle) with the use 'dynamic models' able to implement updated observations and thus to improve the 'predictive capacity' of models and, finally, reducing uncertainty related with future projections.	

1. **AMP TOOLBOX WORKSHOP FOR THE ADRIATIC SEA: A ROLE PLAY WITH SUB-REGIONAL STAKEHOLDERS**

As mentioned above, in order to test effectiveness and usefulness of the AMP Toolbox, as well as collecting valuable advices and recommendation by potential end-users for its improvement and fine tuning, a series of tests were organized by the PERSEUS researchers at two levels (i) Southern European Seas (SES) basin level (accounting for the Mediterranean and Black Seas); and, (ii) Pilot case level (including the Western Mediterranean, Northern Adriatic, Aegean Sea and Western Black Seas).

Within the marine sub-region of the Adriatic Sea a technical workshop including a Role-Playing Game (hereafter: RPG) with international stakeholders (i.e. participants coming from North Adriatic countries as Italy, Croatia and Slovenia) was held on 3rd of June 2015 in Trieste, Italy. This meeting, and related RPG, was organized for testing the AMP Toolbox by simulating its use for the development, implementation and monitoring of a marine policy, applied to the issue of marine litter, specifically focused on the marine area of concern (i.e. Northern Adriatic sea). Given the increasing problems and the still considerable lack of knowledge, marine litter was selected as example for simulating the development and implementation of marine policy.

The game allowed getting focused discussions on each step of the APF and the linked tools, methods and resources available in the Toolbox for their implementation during adaptive policy making processes. More specifically, by means of the RPG we tried to answer to the following key questions:

How will the APF toolbox support adaptive policies?

Does it really lead to more adaptive programs of measures?

Is this what stakeholders are waiting for?

Does it respond to their needs?

Are there any comments or suggestions for its improvement in order to facilitate its use by any policymakers involved in the implementation of the MSFD?

Most of attendees to the workshop have shared, with the team of the PERSEUS project, their point of view on adaptive policies specifically applied for the marine litter issue, and valuable recommendations for improving and fine tuning the AMP Toolbox in a policymaker oriented perspective.

1.1 Planning the workshop

The workshop was structured in a three-stage process as follows:

Firstly, brief power point presentations aimed at introducing the participants to the PERSEUS project and to the activities carried out within WP6 for the development of the AMP Toolbox. Moreover, a short introduction concerning the marine litter issue was provided by a participant representative of the DeFishGear project (http://www.defishgear.net/).

Secondly, the RPG was implemented in order to put participants in decision makers' shoes during the simulated development, implementation and monitoring of adaptive policies aimed at facing marine litter issue.

Thirdly, the workshop was focused on discussion with all the attendees about strengths and weaknesses of the AMP Toolbox.

The workshop was planned for being mainly focused on the second and third stage of this process (i.e. RPG and linked discussions), in order to both actively involve the invited stakeholders on the use of the toolbox by mean of the RPG, and to collect their comments and recommendations for future improvements. Accordingly, in order to facilitate the interaction with them during the RPG, and take note of their comments during the game, specific supporting materials were prepared.

First of all, six different role cards representing different categories of stakeholders (i.e. industrialists of plastic sector, marine experts/scientists, policymakers directly involved in marine management and planning, and NGOs) were arranged in order to direct the behaviour, points of view, objectives and interests to be promoted and defended by the participants during the simulated development of adaptive policies for the marine litter issue in the Adriatic sea.

Figure 15: role cards prepared for implementing the RPG with stakeholders of the Adriatic Sea

Moreover, an empty DPSWR (i.e. driver-pressure-state-welfare-response) scheme was prepared in order to involve all the stakeholders in its compiling, according to their predefined role played in the game. Finally, a step by step focused questionnaire was set for this workshop in order to get a judgment, by all the participants of the RPG, on the following questions:

The step is a useful guide for the MSFD implementation, the target is clearly defined and explained?

All the important and policy-relevant issues are covered in a comprehensive manner?

The information provided is clear, concise, well written and valuable?

What is missing in this step?

Comments and suggestions provided by the attendees are summarized here

1.2 Conducting the workshop

Local stakeholders who attended to the workshop and RPG as well as the team of the PERSEUS project in charge of organizing the workshop are presented in Table 3.

Table 16: Participants in the Workshop performed with stakeholders of the Northern Adriatic Sea (3rd June 2015, Trieste, Italy).

Local stakeholders participating to the workshop and RPG	
Dr. Carlo Franzosini	Marine Protected area of Miramare, Shoreline Soc. Coop, Italy
Dr. Andreja Palatinus	Institute for Water of the Republic of Slovenia – IWRS-, Slovenia
Dr. Isabella Scroccaro	ARPA Friuli Venezia Giulia, Italy
Dr. Mirta Smodlana Tanković	Center for marine Research, Croatia
Dr. Alessandro Crise	National Institute of Oceanography and Experimental Geophysics –OGS-, Italy
Dr. Donata Canu	National Institute of Oceanography and Experimental Geophysics –OGS-, Italy
Dr. Cosimo Solidoro	National Institute of Oceanography and Experimental Geophysics –OGS-, Italy
Dr. Svitlana Liubartseva	Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)
Team of the PERSEUS project organizing the workshop	
Dr. Margaretha Breil (key speaker)	Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)
Dr. Valentina Giannini (RPG moderator)	Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)
Ms. Elisa Furlan (participant)	Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)
Dr. Silvia Torresan (participant)	Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC)

The workshop was held on the 3rd of June from 10:30 to 16:30 in the OGS offices in Trieste (Trieste, Italy). The workshop was carried out according to the aforementioned three-stage process, as follows:

The first phase of the workshop was focused on the presentation of the PERSEUS project and more specifically activities carried out within the WP6 for the development of the AMP Toolbox. This stage has included the following short presentations:

General presentation of the workshop (10 min): Margaretha Breil introduced the workshop with its phases and main objectives of the RPG;

Introduction to the PERSEUS project: Margaretha Breil gave a brief presentation of the work packages, main objectives and results gained so far within the project (20 min).

Introduction to the marine litter issue: Andreja Palatinus from the DeFishGear project introduced the project with its partners and main activities aimed at producing policy recommendation on the status of marine litter and proposals on how to solve the problem, working with fishers and institutes (10 min).

Brief contextualization of the concept of Adaptive Policy Making and the PERSEUS AMP Toolbox: Margaretha Breil presented the AMP Toolbox giving a special emphasis on what is the AMP Toolbox, for whom and why has been developed and how it is applied by mean of an interactive learning cycle (20 min).

The second phase was focused on the implementation of the RPG aimed at involving invited stakeholders in a simulated policy-making process for the development, implementation and monitoring of adaptive policies aimed at facing marine litter issue (3,5 hours). Most time of the workshop was devoted to this phase in order to collect recommendations and advices on the AMP Toolbox provided by all the attendees during the simulated decision making process.

The third phase focused on an open discussion with all the participants in order to collect their overall recommendations and suggestion for the improvement and fine-tuning of the AMP Toolbox in a potential end-user perspective (30 min).

The following section introduces how the RPG was applied to the different steps of the PERSEUS APF and the main results gained during discussion and interaction with stakeholders. These comments appear particularly valuable and useful to define the future improvements and fine-tuning of the Toolbox in a policymaker perspective.

1.3 The RPG: results and comments for improving the AMP Toolbox

The RPG revolves around the designing of a policy for marine litter in the Northern Adriatic Sea using the PERSEUS AMP Toolbox. During the game, stakeholders were requested to draw up, implement and monitor marine policies by applying the specific set of tools and resources provided by the Toolbox.

At the end of each phase of the game, linked with five steps of the adaptive policy cycle, all the participants were asked to complete a questionnaire in order to collect their comments and suggestions for improving the toolbox.

The RPG has started with the assignation of roles for the game to all the participants. Accordingly, role cards were distributed to the players in order to put them in decision makers' shoes. Attendees took over six different roles which were proposed by the participants, and expressed their expectations with respect to a tool guiding through an adaptive policy making process. Six roles have been assigned to the invited stakeholders as follows:

✓ Expert: scientist/researcher ;

✓ Responsible for the regional department of Environment;

✓ Councilor responsible for fishing;

✓ Mayor in a coastal community urbanization and services;

✓ Non-governmental organization;

✓ Industrialist plastic sector.

Each role was characterized by a specific decision making authority, responsibilities and objectives and interests to defend during policy-making processes which can affect the represented community.

Roles assignation was followed by the step by step implementation of the adaptive policy cycle using some of the tools and resources provided by the AMP Toolbox.

Step 1: Setting the scene

This first phase was focused on tools and methods included in the AMP Toolbox for supporting the implementation of the following two key activities:

o Gather information and determine the current situation taking into account the geographical area of concern and issues to be faced by the policy.

o Select people (i.e. experts and stakeholders) to be involved in the different stages of the policy cycle.

As far as tools for analyzing the current situation are concerned, during the RPG the DPSWR framework was compiled through a wide brainstorming with all players. Main aim of this task was to analyze the causal interactions between society and the environment and thus linking the effects that socio-economic uses of the marine environment can have both in the marine ecosystems and human wellbeing. Figure 5 represents the final framework elaborated during this brainstorming.

This step of the RPG allowed to explore the different perspectives of all players, identifying main environmental impacts produced by marine litter (e.g. decrease of fish stock and quality, impacts

on human health due to bioaccumulation) as well as repercussions for the socio-economic sector (e.g. impacts on income for fishing and plastic industries).

According to the points of view expressed during the RPG, consumption and production of plastics of poor quality were identified as the main drivers of marine litter in the Adriatic Sea, followed by the growing urbanization of coastal areas and the increasing maritime traffic. Moreover, special emphasis was given to the selection of the potential responses for facing impacts produced by the marine litter. While players embodying the experts (i.e. scientist/researcher) gave more importance to the transfer of money for research purposes and to environmental education and training for young generations; players representing an environmental NGO highlighted the importance of defining new and more stringent regulations for plastic producers and of improving the quality of plastics introducing more ecological ones. Finally, also players embodying councilor responsible for fishing underlined the need of finding ways to compensate fisherman for income losses due to decreases of fish quality and stock.
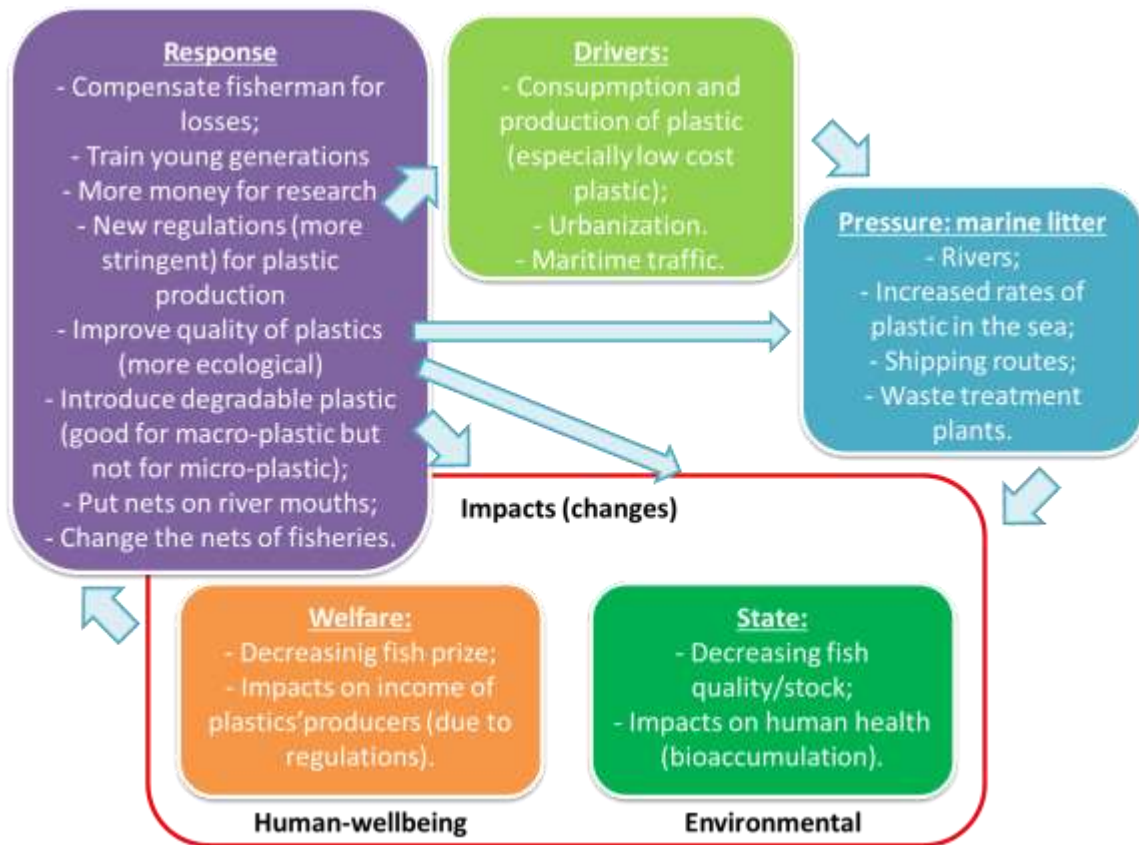
Figure 16: DPSWR framework filled in with participants to the RPG for the marine litter issue

As far as tools for selecting and involving stakeholders are concerned, attendees to the RPG have highlighted the need of improving the AMP Toolbox by including more guidelines and tools aimed at supporting this step and thus simplifying the development of a mutual understanding and the definition of principles and goals for policy design and implementation.

Step 2: Assembling a basic policy

This second phase was focused on the selection of measures for marine litter by exploring 'database of measures' included in the resources of the AMP Toolbox. Several measures (e.g. deposit refund, use of colored nets, implementation of a plastics' net at river mouth) were discussed by comparing costs and benefits based on several criteria suggested by the organizers (e.g. potential to be fair and equitable, avoids unacceptable social impacts, lead to efficient pricing).

At the end of the exercise, attendees to the RPG expressed some comments and recommendations for improving the AMP Toolbox. In particular, they suggested to include in the portfolio of measures, examples from all seas in order to account for cultural and environmental differences. This is an important issue to be considered because, several measures that are viable in Northern Seas are often not viable for the whole Mediterranean Sea (e.g. 'Fishing for litter', measure developed for the Baltic Sea does not work in the Mediterranean Sea, as participants reported).

Step 3: Making policy robust

During the third phase tools and scenarios for developing policies robust against future expected and unexpected conditions have been presented (e.g. contingency plan, IMAGE and "End to End" Models, risk assessment methodologies).

The following open discussion with participants was focused on the importance of using scenarios, data provided by models and monitoring systems for facing uncertainty linked with dynamic ecosystems such as marine areas and changes over time. Moreover, players to the RPG underlined the need of applying indicators' based approaches during policies' design and implementation.

Step 4 and 5: Implementing the policy/strategy and perform adaptive actions

Final phases (4 and 5) were focused on the simulated implementation of the selected measures and participants predicted their outcomes hypothesizing where do we stand in 2020 in order to address potentially emerging issues and trigger important policy adjustments.

During this discussion participants to the RPG underlined need to involve, since the early stage of the adaptive policy making process (i.e. step 1), a solid base of stakeholders in order to have a valuable support for the implementation of the right measures.

At the end of the RPG an open debate was performed among all attendees in order to make general comments and suggestions for the improvement and fine tuning of the overall AMP Toolbox. These suggestions were noted by the team of the PERSEUS project and are summarized as follows:

- ✓ The issue of "who will use this"? was clearly discussed: an underlying hypothesis was that in some cases policy makers actually take decisions without consulting any high level technicians, who were actually those envisaged as potential users; on the other side, policymakers are not able to dedicate as much time as needed to a tool like the AMP toolbox.

- ✓ Add a Step 0 in the APF devoted to the identification of the public authority which has the mandate on the specific issue linked with the management of marine regions.

- ✓ Resources section of the AMP Toolbox, including, for instance, the database of tools and methods and the inventory of measures should be linked to each step of the APF and not only to the right of the web-page.

CONCLUSIONS

While the 1st PERSEUS Advisory Board meeting (Barcelona, January 2013) allowed to better understand regional stakeholders' needs and expectations regarding the PERSEUS APF and its AMP Toolbox, the AMP Toolbox Workshop – held almost two years later (Marrakech, November 2014) –, as well as the other stakeholders' consultation exercises reported in these deliverables, were successful because these meetings demonstrated clearly that the project managed to meet needs and expectations previously expressed by PERSEUS Advisory Board members and regional or sub-regional stakeholders. The members of the Advisory Board showed a positive and supportive opinion on the AMP Toolbox. They congratulated the team on the achievements and the amount of information and knowledge collected. Constructive remarks were made regarding the efforts produced including the necessary improvements to bring to the structure of the toolbox. Indeed, the presentation of the information on-line should, according to regional stakeholders, be reviewed as it is too scientific oriented. Moreover, it is requested to clarify the level of application of the AMP Toolbox (i.e. local, national, regional, etc.), and to take into account the need of supportive material or some training sessions. That calls for further improvements of the AMP Toolbox available online - which was an ongoing activity implemented by WP6 Task4 - but also to develop collaboration and synergies between work packages in order to implement efficiently the improvements identified. Finally, the Advisory Board meeting held in Marrakech was the opportunity to open the discussion on the follow-up of the project, notably the management and update of the toolbox at the end of PERSEUS.

Appendix III.b: AMP Toolbox experimentation on basin scale

In order to implement and test the usefulness of the AMP Toolbox, as well as to improve it with the lessons learnt during the experimentation, the tests have been performed at two levels: (i) Pilot case level (including the Western Mediterranean, Adriatic, Aegean and Western Black Seas); and, (ii) Southern European Seas (SES) or basin level (accounting for the Mediterranean and Black Seas). **In order to carry out the tests at basin level we implemented**

A. **The high Policy Level with the Black Sea Commission**
B. **The SES or basin level Stakeholders Platform, including principally the members of PERSEUS´s Advisory Board.**

In this section the planning and the technicalities of the experimentations as well as the results of the conducting tests are presented.

The High Policy Level AMP experimentation with the Black Sea Commission

4.1. Introduction

The main objective of this section is to present the activities carried out during the International Black Sea Day meeting (Istanbul 3rd November 2014) for testing the AMP Toolbox with high level decision-makers in order to get their feedback and suggestions for further developments. The International Black Sea Day meeting took place in Istanbul on the 3rd November 2014 to commemorate the 20th Anniversary since ratification of the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention) in 1994 and its Protocols. Bucharest Convention has been signed and ratified by all six legislative assemblies of the Black Sea countries (i.e. Bulgaria, Georgia, Romania, Russian Federation, Turkey and Ukraine). It includes the basic framework of agreement and three specific Protocols:

(1) The control of land-based sources of pollution;

(2) Dumping of waste; and

(3) Joint action in the case of accidents (such as oil spills).

For the purposes of AMP testing two main activities were planned: 1) A presentation of PERSEUS research activities and 2) a hands-on demonstration and deliberation with the Black Sea Commissioners and guests.

4.2. Organization of the experimentation

The Permanent Secretariat of the Bucharest Convention organized the International Black Sea Day meeting at the premises of Point Hotel Taxim. The fifty-five participants included the six Black Sea Commissioners, the BSC PS Executive Director,

the General Secretariat, national representatives, observers and guests. PERSEUS project was represented by a team of eight scientists who actively helped in the discussion that followed and assisted the delegations to express their opinion on the feedback questionnaire that has been especially developed for this reason.

The PERSEUS Coordinator, Dr. Vangelis Papathanassiou, presented the scope of the PERSEUS Project to the participants (13 high-level officials from the Black Sea countries and 25 guests and observers). EMBLAS, MISIS and IRIS-SES project were also presented. After the project presentations, PERSEUS had a 2,5-hour workshop with the delegations, guest and observers on the Adaptive Marine Policy Toolbox. Prof. Michalis Skourtos made the on-line presentation of the AMP-Toolbox together with Mrs. Emily Koulouvaris. Prof Skourtos was also the facilitator of the lively and interactive discussion with the Commissioners and guests.

The meeting was a first hands-on experimentation from a series that PERSEUS project had planned in the high level Policy makers.

The workshop was divided into four main steps:

1) A Power Point Presentation (10 minutes) to **document the AMP Toolbox necessity** to assist policy makers and its potential use (attached to Appendix III.e). Interesting discussion points were also introduced concerning how science can support policy making and at what level this support could take place. This was carried out by the facilitator Prof. M. Skourtos

2) **Presentation of the AMP Toolbox** (30 minutes), carried out by the facilitator, where a general overview of the AMP Toolbox was provided. The 5 steps of policy making were explained, the notion of adaptive policy was recognized, the AMP Toolbox general structure was explained, specific tools were visited and its use was shown. Finally information about the resource base and its use was given together with explanations on how specific problems could be addressed by its use.

3) **Hands-on with the AMP Toolbox / experimentation** (60 minutes), where each participant was asked to explore the different sections of the toolbox (having in mind one specific policy issue of their choice), and take notes in the provided template for further discussion. Participants were encouraged to comment and interact regarding specific issues concerning policy making/AMP relevance etc. A fruitful discussion took place raising several comments and suggestions from the part of participants.

4) **Evaluation of the tool** (30 minutes). One or two representatives from each Delegation were interviewed by PERSEUS WP6 scientists. The evaluation of the AMP Toolbox was implemented by filling the questionnaire either online, or on the available hard copy. The PERSEUS web-based questionnaire (see Appendix III.c this report) was used to collect the opinions and suggestion of the stakeholders (http://www.perseus-net.eu/en/feedback/index.html). This questionnaire contains two different sections, one with closed format questions (i.e. Likert questions) and the second one with open format questions (i.e. General comments and suggestions). The Likert questions are useful since they help you assess how your respondents feel towards the AMP Toolbox, based on a scale of five levels (from strong disagreement

to strong agreement) regarding the different components of the AMP Toolbox (i.e. Scope, Content, User interactions, Technical aspects and Support). Finally, open questions were provided in the questionnaire in order to encourage participants to give their comments and suggestions regarding the different components of the AMP Toolbox.

Concerning the experimentation phase (lasting 60 minutes): Our strategy was to position the participants in a situation where they could envisage a specific marine issue **with and without the AMP**. Participants were encouraged to propose for discussion a marine issue considered of outmost importance for promoting a healthy Black Sea environment. We anticipated that this would be either fisheries (i.e. anchovy) or invasive species (i.e. Mnemiopsis leidyi). This issue was then used as a 'benchmark' for our comparative analysis. Further discussion was targeted to what would have been different had the state officials in their disposal the AMP. Or, alternatively, what would be different for future policy support and design now that AMP was provided in their support.

The session was structured as a round table (Figure 7): The facilitator welcomed the participants and briefly introduced AMP. The introduction followed the sequence of the five policy steps pinpointing key aspects. Then participants were prompted to suggest a marine issue at risk for the Black Sea environment that they consider of special importance. Participants were then invited to take a 'tour' through AMP having in mind the marine issue(s) we agreed upon. The facilitator urged them to think the problem in terms of the AMP: would the availability of such a tool had helped them in the past to address the issue? Will it help in the future? In what sense would AMP be useful (by providing information, structuring the problem, showing solutions, providing access to tools and databases, alerting about data gaps, public deliberation, expert involvement, etc.)?

PERSEUS scientists, acting as supporters to the facilitator, took notes having in mind the basic questions of the evaluation protocol. As the end of the discussion each participant was asked to fill the evaluation protocol. At the end of the session, PERSEUS scientists discussed the procedure and crosschecked their notes.

Figure 17. The High Policy Level AMP Workshop-Black Sea Commission

4.3. Main outcomes of the workshop

The PERSEUS scientists attending the workshop compiled the comments and suggestions of all participants by taking notes throughout the session and by assisting the completion of the online questionnaires (Figure 8). We present in this section the main topics discussed and give a first assessment of their relative weight for the AMP toolbox.

A first, general remark pointed to the fact that the AMP toolbox is not meant to be "something that opens the door for ready-made solutions; it's rather something that helps you digest the problems…. it is not a single tool, one should analyze/explore what specific tools are available already." A much sought after information referred to examples or cases of best practices.

‘AMP seems a very good tool for policy makers to be informed about best practices concerning Adaptive Policies ‘

'AMP looks like it could work better in established procedures. Some policy making cases are very clear, you only need to go on with AMP Toolbox '

'Does AMP includes a method to assess policy making? Is there enough data? How do you find the relevant coefficients? After all there might be bad politicians, not bad policies.'

'In order to follow the different futures described by the potential of AMP Toolbox there should also be legal and institutional conditions. If you change the rules and institutional structures there might be a contradiction '

'This is just a Toolbox. It depends on the policy maker or planner how to use it. It resembles the way you use a Tool: screw or unscrew something. This Toolbox is meant to facilitate the whole process of policy making '

'We'll inform immediately the Regional Directorate for this Toolbox. We have enough Regulations in our country, now we only need to act! '

'The Resources part of this Toolbox seems to be the best case '

'Policy makers need to understand: what kind of data is needed? Maybe there is a need of a list of things which policy makers need to take into consideration for each problem (e.g. in the case of chemical pollution). '

'On the scope section: AMP Toolbox seems extremely useful for policy makers who want practical information and data bases, but before decision making (e.g. for fisheries) in a multinational decision context, you need to check the legal documents

used by different countries. So a decision maker needs more info on legal matters, more clarifications and best examples. '

'You would improve the AMP Toolbox by putting some contact points, e.g. experts or policy makers, who are able to give more info on a specific problem '

Referring to the *scope* of AMP Toolbox participants suggested that the tool could be highly useful for a broad audience and particularly for policymakers. However, they mentioned that its usefulness for other audiences and general stakeholders is something they need more time to address and evaluate. They indicated that the tool should be oriented not primarily to national level because most of environmental problems are trans-national. For example, they mentioned the issue of fishing quotas: although they are set in Black Sea, not all countries are complying with them. Real addresses of the AMP toolbox should be experts of an intermediate level, which may need to have a look into solutions adopted in other countries. Accordingly, the importance of examples was underlined. On the other hand, three participants commented that AMP couldn't be described as toolbox – rather a database, a library or a dictionary. In addition, although the respondents generally agreed on the fact that the toolbox is useful to policy-makers involved in MSFD implementation, they found the toolbox ineffective for this target group, as a consequence of the way the features are presented. Low comprehensiveness, low motivation were also mentioned together with not clear structure.

Referring to the *content* of the AMP, a participant asked for incorporating further information in the knowledge base that he thought was missing. He also suggested that the current structure is not obvious to the user hiding its potential. More examples are needed explaining better how someone could use the tool.

Referring to the ability of AMP to accommodate *user interactions* in a friendly and understandable way most participants expressed a critical view emphasizing that it could had been categorized and organized in a more efficient manner. This might have been the result of a time intensive and, unavoidably, rapid journey through the layers of information available in AMP, which did not allow the participants get a full grips of its structure. Nevertheless, it was noted that user friendliness might differ from person to person because of the different background of the user.

Referring to the *Support* provided by the AMP to the user, again the participants stressed the lack of contact information or support form at the current version of the tool. It could be useful to address more clearly the purpose of the AMP and include some general guidelines to explain what the user is going to found in the toolbox in order to understand better its contents. They asked for a more functional way to provide for search within the tool and suggestions, e.g. a button for support.

In addition to the specific remarks on the AMP Toolbox, participants suggested ways to improve its functionality and user friendliness. More than one suggestion were concerned with adding support material (guidance, roadmap of the site, suggestions form) whereby the provision of practical, fully policy relevant examples was strongly and repeatedly emphasized. Other concrete actions suggested were:

• Create a video tutorial showing how to use the tool with one example.
• Breakdown a current policy into the different steps in order to illustrate the steps.
• If addressing policy makers (highest level) much shorter texts (executive summary) would be needed

Although the content was rated as very useful, it was suggested to link the AMP Toolbox to Google in order to supplement its potential of resource search and recommendations. Nevertheless, the proposal by three participants to create a section in the AMP where the policymaker ask about an environmental issue/problem and the toolbox provides an answer, reveals the necessity to better explain at the forefront the intended role and function of the AMP. Last but not least, most of the suggestions culminated to the need of providing support material and assistance (or as one participant put it: small technical projects on national level) to facilitate acquaintance and familiarity with AMP.

Commission on the Protection of the Black Sea Against Pollution

International Black Sea Day -2014

3rd November 2014, Istanbul, Turkey

List of Participants in the AMP Workshop

Name	Affiliation
Bulgaria	
Mr. Vladimir Dontchev	Deputy Minister, Ministry of Environment and Water of Bulgaria
Ms. Violeta Roiatchka	State Expert, Water Management Directorate, Ministry of Environment and Water of Bulgaria
Georgia	
Ms. Niko Tskhadadze	Chief Specialist, Service of Water Resources Management, Ministry of Environmental Protection and Natural Resources, Tbilisi
Mr. Tornike Phulariani	Division of Environmental Policy, Ministry of Environment Protection and Natural Resources
Ms. Maia Ochiava	Member of Executive Board of BSNN from Georgia, Tbilisi
Romania	
Ms. Valeria Abaza	Scientist, National Institute for Marine Research and Development, Constanta
The Russian Federation	
Mr. Anatoly Krutov	Principal Research Fellow, State Oceanography Institute, Moscow
Ms. Ekaterina Antonidze	Kuban Basin Water Directorate, Ministry of Natural Resources, ICZM Center, Krasnodar
Mr. Eugene Belan	Kuban Basin Water Directorate of the Federal Agency of Water Resources, Krasnodar
Turkey	
Mr. Muhammet Ecel	General Director of General Directorate of Environmental Management, Ministry of Environment and Urbanization of Turkey
Mr. Murat Turan	Head of Marine and Coastal Management, General Directorate of Environmental Management, Ministry of Environment and Urbanization of Turkey
Ukraine	
Ms. Oksana Tarasova	Advisor to Minister of Environment and Natural Resources of Ukraine
Mr. Ievgen Patlatiuk	State Ecological Inspection of the Black Sea Protection, Odessa
Black Sea Commission Permanent Secretariat	
Prof. Halil Ibrahim Sur	Executive Director
Ms. Iryna Makarenko	Pollution Monitoring and Assessment Officer

Guests	
Dr. Vladimir Mamaev	Regional Technical Advisor, International Waters, United Nations Development Programme (UNDP), Istanbul Regional Centre for Europe & CIS
Mr. Svetoslav Stoyanov	Policy Officer, European Commission, Directorate-General Maritime Affairs and Fisheries, Maritime Policy Mediterranean and Black Sea (MARE D. 1)
Mr. Nicola Di-Pietrantonio	European Commission, DG DEVCO
Mr. Alexander Bakalov	Executive Manager, Organization of the Black Sea Economic Cooperation, Permanent International Secretariat, Istanbul – Turkey
Dr. Evangelos Papathanassiou	Research Director, Hellenic Centre for Marine Research, Coordinator of PERSEUS Project
Mr. Nikos Streftaris	Marine Biologist, PERSEUS & IRIS-SES Project Manager, Hellenic Center for Marine Research
Ms. Violeta Velikova	EMBLAS CTA
Ms. Marcela Fabianova	Water Programme Analyst, EMBLAS
Mr. Vasyl Kostiushyn	EMBLAS Project Manager
Ms. Lilia Spasova	EMBLAS Project Assistant
Ms. Colpan Beken	MISIS Project, TUBITAK-Marmara Research Center
Ms. Olga Konareva	EMBLAS Project, Senior Research, ONU Ukraine
Mr. Sergey Konovalov	EMBLAS Project, Head of Department, MHI, Sevastopol
Ms. Niko Machitadze	EMBLAS Project, Senior Scientist, TSU, Georgia
Mr. Aleksandr Mikaelian	EMBLAS Project, Leading Scientist, SIO-RAS, Russia
Ms. Galyna Minicheva	EMBLAS Project, Deputy Director, OB IBSS, Ukraine
Ms. Alexander Boltachev	EMBLAS Project, Deputy Director, OB IBSS, Sevastopol
Mr. Ruben Kosyan	EMBLAS Project, Head of department of the coastal zone at Southern branch of the P.P. Shirshov Institute of oceanology, RAS
Mr. Alexander Postnov	EMBLAS Project, Deputy Director, State Oceanographic Institute, Moscow
Mr. Alexey Khaliulin	EMBLAS Project, MHI, Sevastopol
Mr. Eugeny Godin	EMBLAS Project, MHI, Sevastopol
Mr. Aleksandr Korshenko	EMBLAS NFP, Head of laboratory, State Oceanography Institute, Moscow
Ms. Tamara Shiganova	EMBLAS Project, Leading Scientist, SIO-RAS, Moscow
Ms. Marine Mgeladze	EMBLAS NFP, Head of Environmental Pollution Monitoring Department, Ministry of Environmental Protection and Natural Resources, Tbilisi
Mr. Yuriy Denga	EMBLAS Project, Ukrainian Scientific Center of

	Ecology of Seas, Odessa
Mr. Richard Lisovskyi	EMBLAS Project, Ukrainian Scientific Center of Ecology
Ms. Jarmila Makovinska	EMBLAS Project
Mr. Zurab Jincharadze	EMBLAS Project
Prof. Michalis Skourtos	Member of the SSC of the PERSEUS Project, Integration Expert, Professor for Environmental Economist, Agricultural University of Athens, Greece
Prof. Areti Kontogianni	Professor Dr. Environmental Economics University of Western Macedonia, Greece, PERSEUS Project
Dr. Margaretha Breil	Centro Euro-Mediterraneo per I Cambiamenti Climatici (CMCC), Italy, PERSEUS Project
Dr. Maialen Garmendia	Basque Centre for Climate Change (BC3), Spain, PERSEUS Project
Dr. David March Morla	Spatial Ecologist, PERSEUS Project, IMEDEA
Dr. Julien Le Tellier	Programme Officer – Territorial Approaches, Plan Bleu, France, PERSEUS Project
Ms. Emma Gileva	Black Sea NGO Network (BSNN), Bulgaria, PERSEUS Project
Ms. Emily Koulouvaris	Member of the SCC of PERSEUS Project, WP Leader of Communication WP, EIR-Global, Belgium
Ms. Ayaka Amaha	Turkish Marine Research Foundation (TUDAV)
Mr. Yavuz Eroglu	Waste Free Oceans (WFO) Turkey, Mutlu Baliklar Happy Fish
Ms. Yarmur Cengiz	Waste Free Oceans (WFO) Turkey, Mutlu Baliklar Happy Fish

Workshop with the Advisory Board

In addition to Stakeholder Platforms (SHPs) organized at the sub-basin level (pilot case areas), the Southern European Seas SES SHP is strongly linked to the management office of the project and through the involvement of the PERSEUS Advisory Board (Table 1).

Table 17: Members of the PERSEUS project´s Advisory Board

Name, surname	Organisation, Function
Prof. Fokion Vosniakos, Chairperson	Balkan Environmental Association-BENA, President
Dr. Tatjana Hema	MED POL - UNEP/MAP, Programme Officer
Prof. Halil Ibrahim Sur	Black Sea Commission / BSC, Director of the Permanent Secretariat
Dr. Iouri Oliounine	IOC/UNESCO, Assistant Secretary
Prof. Frederic Briand	CIESM, Director General
Dr. Paolo Lombardi	WWF Med Programme, Office Director
Dr. Henri Farrugio	Chairman of the Scientific - General Fisheries Commission for the Committee Mediterranean / GFCM
Dr. Niall McDonough	Marine Board-ESF, Executive Scientific Secretary
Dr. Trine Christiansen	EEA, Project Manager
Mr. Michail Papadoyannakis, replaced by Mrs. Marjana Mance Kowalsky	DG ENV, Marine Unit D.2
Mrs. Anita Vella	DG MARE, Policy Officer

The PERSEUS Advisory Board gathers the "International / Regional Stakeholders" for the Southern European Seas – Mediterranean and Black Sea Stakeholder Platform (SES SHP). During the 1st PERSEUS Advisory Board meeting (Istanbul, January 2012), they agreed to be part of the SES SHP, and they named a Chairperson: Prof. Fokion Vosniakos (BENA). They were the main target of the first stakeholder meeting which was held in Barcelona on 25 January 2013 back-to-back with the 2nd PERSEUS general assembly.

Therefore the SES SHP is made up of members of the PERSEUS Advisory Board in which the two intergovernmental bodies established for the implementation and follow-up of the Barcelona and Bucharest Conventions are represented (i.e. the Mediterranean Action Plan (UNEP/MAP) and the Commission on the Protection of the Black Sea Against Pollution (BSC) respectively).

The AMP workshop with the PERSEUS project Advisory Board was held on the 1st of December 2014 from 18:30 to 20:00 at the Hotel Kenzi Club Agdal Medina (Marrakech, Morocco); A similar strategy to the Black Sea Commission workshop has been followed. The workshop was conducted according to the following steps,

consisting on 4 main milestones: (i) an introduction to the AMP Toolbox; (ii) a presentation of the AMP Toolbox; (iii) a presentation of an example or a potential application; and, (iv)the collection of the Advisory Board members' opinion and suggestions. For this purpose the following material has been prepared by the members of WP6.

- ✓ <u>Brief contextualization of the AMP Toolbox</u>

- ✓ <u>Brief presentation on the structure, objectives and functionality of the AMP Toolbox</u>

- ✓ <u>Presentation of an example or a storyline of an issue at Risk of not achieving or maintaining Good Environmental Status</u> in order to see how the different steps, key activities and resources within the AMP Toolbox could be applied. Given the increasing problems and the lack of knowledge, Marine Litter was selected as example or storyline). The preparation of the example was particularly laborious, since it required to: (a) compile information on the issue in question; (b) apply the different steps, key activities and resources to the issue in question; and, (c) present all the information in a friendly and easy-to-understand manner. Accordingly, apart from the PowerPoint provided in Appendix 3, in the following sub-section, the example is described in detail.

- ✓ <u>The PERSEUS web-based questionnaire was used to collect the opinions and suggestion of the stakeholders</u> (http://www.perseus-net.eu/en/feedback/index.html). This questionnaire contains two different sections, one with closed format questions (i.e. Likert questions) and the second one with open format questions (i.e. General comments and suggestions). The Likert questions are useful since they help you assess how your respondents feel towards the AMP Toolbox, based on a scale of five levels (from strong disagreement to strong agreement) regarding the different components of the AMP Toolbox (i.e. Scope, Content, User interactions, Technical aspects and Support). Finally, open questions were provided in the questionnaire in order to encourage participants to give their comments and suggestions regarding the different components of the AMP Toolbox.

- ✓ Collection of the opinion and suggestions of the members of the Advisory Board (40 min): An open discussion was also performed among all the participants in order to make general comments and suggestions. These suggestions were noted by the PERSEUS participants. Moreover, the members of the Advisory Board also had the opportunity to make this kind of suggestions along the whole process.

The members of the Advisory Board showed a positive and supportive opinion on the AMP Toolbox. The four members of the Advisory Board who participated in the AMP Toolbox Workshop congratulated the team on the achievements and the amount of information and knowledge collected.

Generally, they criticized the way the information is presented (i.e. too scientific), the need to clarify the level of application of the AMP Toolbox (i.e. local, national, regional,

etc.) and the need of supportive material or some training. In Table , the comments of the members of the Advisory Board are detailed according to the different characteristics of the AMP Toolbox to be improved. **These comments were particularly valuable for the AMP improvements.**

Table 4: Comments and suggestions provided by the Advisory Board at the AMP Toolbox Workshop.

Support	
Need for a glossary	Prof. Fokion K. Vosniakov
Need for training	Ms. Tatjana Hema
Need for Guidance documents (e.g. PowerPoints).	Ms. Tatjana Hema
Comprehensive, but training is needed; otherwise it is time-consuming to find things. It is difficult to arrive to the page you need to consult. **[Vangelis Papathanassiou: It is a matter of presentation]**	Ms. Irina Makarenko
Appearance, style, design	
Still too scientific	Ms. Tatjana Hema
It should be more proactive with the text	Prof. Fokion K. Vosniakov
Huge amount of scientific work available. Risk: profusion of info could discourage end-users.	Prof. Fokion K. Vosniakov
Scope	
Room for improvement for other targets (e.g. civil society). Side event such as summer schools are positive to show and train civil society.	Prof. Fokion K. Vosniakov
It should be clarified that it is a process to recommend and support in decision-making; and not a press button machine providing response/solution.	Ms. Tatjana Hema
Specific introduction making emphasis clearly on scope and targets should be included.	Ms. Tatjana Hema
The level of application (i.e. local, national or regional) of each tool or method should be clarified.	Ms. Tatjana Hema
What about coastal degradation? (the actual scope seems to apply	Ms. Tatjana Hema

only marine degradation)	
It is not so clear about regional commitments. These should be checked by Regional Sea Conventions (RSCs) - more integration with RSCs	Ms. Irina Makarenko
Make clear the different levels of application of the AMP Toolbox and the purpose of each tool or method (i.e. local, national or regional)	Prof. Fokion K. Vosniakov
Contents	
I would like more examples, if possible for each MSFD descriptors. Very good efforts on examples. Marine Litter should be complemented with more examples.	Ms. Tatjana Hema
2/3 of the Mediterranean Countries is not within EU and has not to enforce the MSFD. The Ecosystem Approach (EcAp) initiative is rightly mentioned but it is only a part of the environmental programmes performed under UNEP/MAP, see also the current Regional Action Plan update. Regarding Marine Litter, there is a need for taking into account right and more recent documents of UNEP/MAP.	Ms. Tatjana Hema
Marine accident: How a 'poor mayor' could use and apply the toolbox? [Didier Sauzade: Frankly, it has not done for that. Focus on the call: implementation of MSFD (PoMs) at national and regional scales, as stressed during the Advisory Board session on the AMP Toolbox in Barcelona.]	Prof. Fokion K. Vosniakov
Need to be understandable and useful for a broader group of users, who do not have scientific knowledge or background	Prof. Fokion K. Vosniakov
Others (continuity)	
Who is going to take care after the project?	Ms. Tatjana Hema
What about updating the AMP Toolbox after the end of the project?	Prof. Fokion K. Vosniakov
Others (collaboration)	
Currently, there is a lack of sufficient knowledge-base to assess issues correctly. In this regard, further collaboration is necessary within the project since the work performed within WPs 1&2 is of great interest (apart from the reporting from EU Members States)	Dr. Claudette Spiteri
Need for more collaboration and synergies between WPs, otherwise	Prof. Fokion K.

risk of overlapping.	Vosniakov
There are still gaps in documents and reports of the Black Sea Commission: PERSEUS and the AMP Toolbox could help to bridge these gaps.	Ms. Irina Makarenko

Figure 18. Discussion about the AMP Toolbox.

1.1. Results

This section introduces the comments of the members of the Advisory Board that are detailed according to the different characteristics of the AMP Toolbox to be improved.

Comments on the support:

Several requirements have been pointed out by the stakeholders consulted, notably the importance to add a glossary (Prof. Fokion Vosniakos) but also to prepare guidance documents and to organize training sessions to use efficiently the AMP Toolbox (Ms. Tatiana Hema). Indeed, training appears to be necessary in order to avoid time-consuming and to target the information rapidly (Ms. Irina Makarenko).

Comments on the appearance style and design:

The AMP Toolbox webpages provide an important number of scientific information and references that are on one hand very useful for the user but on the other hand could discourage and make difficult the appropriation of the tool.

Comments on the scope:

The AMP Toolbox is a repository of guidelines and resources to develop adaptive marine policies in the Mediterranean and Black Seas. It is important to remind that this tool assists the user by providing recommendation and support in decision-making, and does not have to be considered as a press button machine providing response and solutions.

Furthermore, some clarifications are required with regards to the level of application (i.e. local, national or regional) of each tool or method used (Ms. Tatiana Hema, Prof.

Fokion Vozniakos). A specific introduction making emphasis clearly on scope and targets should be included in the webpages of the toolbox. Coastal degradation should additionally be taken into account as the actual scope seems to apply only marine degradation. (Ms. Tatiana Hema).

Prof. Fokion Vozniakos suggested also to organize a side event such as summer school which is a positive initiative to show and train civil society.

Comments on the content:

• This part of the discussion highlighted an important suggestion to improve the AMP Toolbox, which is the development of examples in order to illustrate the steps and to reach the MSFD descriptors. Important efforts have been produced to develop examples notably through the marine litter case but should be complemented with additional ones (Ms. Tatiana Hema).

• Besides, it is pointed out that two thirds of the Mediterranean Countries are not EU Members States and have not to enforce the MSFD. The Ecosystem Approach (EcAp) initiative is rightly mentioned but it is only a part of the environmental programmes performed under UNEP/MAP (Ms. Tatiana Hema).

• A discussion was opened about the users targeted for the toolbox. Prof. Vokion Fozniakos stated that the toolbox needed to be understandable and useful for a broader group of users who do not have a scientific knowledge or scientific background. Moreover, he shared his interrogation on how a "poor" mayor could use and apply the toolbox, in particular in case of marine accident. Didier Sauzade reacted to this questioning by reminding the discussion held during the previous Advisory Board in Barcelona. Indeed it was stressed that the toolbox was elaborated in order to implement the MSFD through the Programmes of Measures at national regional scales.

Other issues:

The follow-up of the project has been discussed by the participants, in particular the management and update of the AMP toolbox after the end of the project (Ms. Tatiana Hema, Prof. Vokion Voszniakos).

In addition, a lack of sufficient knowledge-base to assess the issues correctly has been considered by Dr. Claudette Spiteri. She added that further collaboration was necessary within the project since the work performed within Work Packages 1 and 2 was of great interest. Prof. Fokion K. Vozniakos agreed with this point and insisted on the collaboration and synergies between PERSEUS Work Packages that need to be developed in order to avoid overlapping.

Finally, it is proposed to use the PERSEUS project and in particular the AMP Toolbox as a tool helping to bridge the gaps existing in documents and reports of the Black Sea Commission (Ms. Irina Makarenko).

Appendix III.c: The web-based AMP evaluation protocol

AMP TESTING

Evaluation Protocol

Name: _____

Address/tel/email: _____

Job Title: _____

Responsibilities: _____

Years in present position: _____

Date of testing: _____

Location of testing:_____

Form of testing:_____

Policy issue(s) discussed:_____

INSTRUCTIONS

Please circle the response to the items. Rate aspects of the AMP on a 1 to 5 scale:

1 = Strongly disagree; the user expresses the lowest, most negative impression

2 = Disagree

3 = Neither agree nor disagree; the user expresses a medium stance

4 = Agree

5 = Strongly agree; the user expresses highest, most positive impression

A. Scope of the AMP

Q1. The tool is useful to policy-makers involved in MSFD implementation	1	2	3	4	5
Q2. The target of the tool is well defined and clearly explained to the user	1	2	3	4	5
Q3. The tool contains adequate information referring to its inputs	1	2	3	4	5
Q4. The tool is effective with the intended target group of scientists	1	2	3	4	5
Q5. The tool is effective with the intended target group of policy makers	1	2	3	4	5

Q6. The tool is effective with the intended target group of policy makers with a strong scientific background	1	2	3	4	5
Q7. The tool is effective with the intended target group of general stakeholders including users with different abilities and experiences	1	2	3	4	5
Q8. The tool is comprehensive	1	2	3	4	5
Q9. The tool performs its intended functions satisfactorily	1	2	3	4	5
Q10. The tool is attractive and interesting so as to motivate the user to utilize it	1	2	3	4	5
Q11. There are no other similar tools available in this area	1	2	3	4	5

B. Content

Q12. All important and policy-relevant issues are covered in a comprehensive manner	1	2	3	4	5
Q13. The information provided is clear, concise and well-written	1	2	3	4	5
Q14. The information provided is valuable	1	2	3	4	5
Q15. The structure of the tool is clear, logical, and understandable to the user	1	2	3	4	5

C. User interactions

Q16. It is easy to use the tool's functions	1	2	3	4	5
Q17. The tool has been categorized and organized in an efficient manner	1	2	3	4	5
Q18. The user can easily access the sources provided in the tool	1	2	3	4	5
Q19. The user has the choice of either going directly to the desired topic or use a structured approach to relevant topics	1	2	3	4	5
Q20. The navigational features of the tool are well-constructed	1	2	3	4	5
Q21. The tool acknowledges the introduction of input data and the provided feedback is employed effectively	1	2	3	4	5

Q22. The retrieved information from the implemented searching queries is accurate and valuable	1	2	3	4	5
Q23. The program provides a copy or summary of its basic information to the user for future reference	1	2	3	4	5

D. Technical aspects

Q24. The included workable interactive features such as forms and menus can be characterized as satisfactory	1	2	3	4	5
Q25. All the provided links are reliable	1	2	3	4	5
Q26. The tool is reliable in normal use and is bug free	1	2	3	4	5
Q27. The time response of the tool is satisfactory	1	2	3	4	5

E. Support

Q28. It is easy to inform the developers about potential technical malfunctions	1	2	3	4	5

F. SUGGESTIONS FOR IMPROVEMENT

Scope: Does the AMP addresses the right questions / issues / groups of users? What is missing? What parts should be strengthened? What is superfluous? / Is the AMP better suited to target specific issues and not others? (Which ones?)

ANSWER:………………………………………………………………………………………………………
………
………
………………………………………………………………………………………

Content: Does the AMP contain all necessary information? What is missing? What parts should be strengthened? What is superfluous? How can its coverage be improved?

ANSWER:………………………………………………………………………………………………………
………
………
………………………………………………………………………………………

<u>User interactions</u>: Is the AMP user friendly? Is it flexible? How can its easiness be improved?

ANSWER:………………………………………………………………………………………………

……

……

……………………………………………………………………………………………

<u>Technical aspects</u>: Is the AMP technically up to the required standards? Does it conform to existing practices? How can it be improved?

ANSWER:………………………………………………………………………………………………

……

……

…………………………………………………………………………………………

<u>Support</u>: Is the support to the user satisfying? What is missing? What parts should be strengthened? What is superfluous? How can it be improved?

ANSWER:………………………………………………………………………………………………

……

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…………………………………………………………………………………………

General remarks:

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………………………………………………………………………………………………

Appendix III.d: The AMP evaluation survey results

The experimentation process of AMP apart from the **qualitative assessment** in the form of comments and general discussion (described in the Appendices 3A& 3B) resulted in a **quantitative assessment** supported by a web-based, structured questionnaire. This functioned as a common protocol on which the AMP Toolbox evaluation was based. The full version of the web-based questionnaire can be found in Appendix III.c of this report. The survey results are presented in the present Appendix III.d.

The web-based questionnaire was linked under a PERSEUS website section called FEEDBACK: http://www.perseus-net.eu/en/feedback/index.html

It contains 28 closed format questions trying to evaluate different components of the AMP Toolbox on a Likert five level scale:

AMP **Scope** (11 questions)

AMP **Content** (4 questions)

AMP **User interaction** (8 questions)

AMP **Technical aspects** (4 questions)

AMP **Technical support** (1 question)

These Likert scale based questions helped to assess different respondents' views towards the AMP Toolbox. The respondents' evaluation was based on a scale of five levels (from strong disagreement to strong agreement) regarding the different aspects of AMP.

Most of the questionnaires were filled immediately after completion of the in-depth interviews and the workshops. The PERSEUS WP6 team assisted the filling of questionnaire by the participants. Totally, 45 stakeholders completed the questionnaire for the assessment of the AMP Toolbox. Out of the 45 participants, 14 are policy makers and 31 are scientists.

The quantitative results from the analysis of the questionnaires are presented in this section. The analysis following below is done separately for each section of the questionnaire.

Scope

The first section of the questionnaire examined the fulfillment of the AMP Toolbox scope. The majority of the respondents (68%) agreed with the usefulness of the AMP Toolbox implying that the tool facilitates the effective implementation of the MSFD (Figure 9). Only a minority expressed a disagreement toward this assertion (9%) while 23% of them were unwilling either to agree or to disagree.
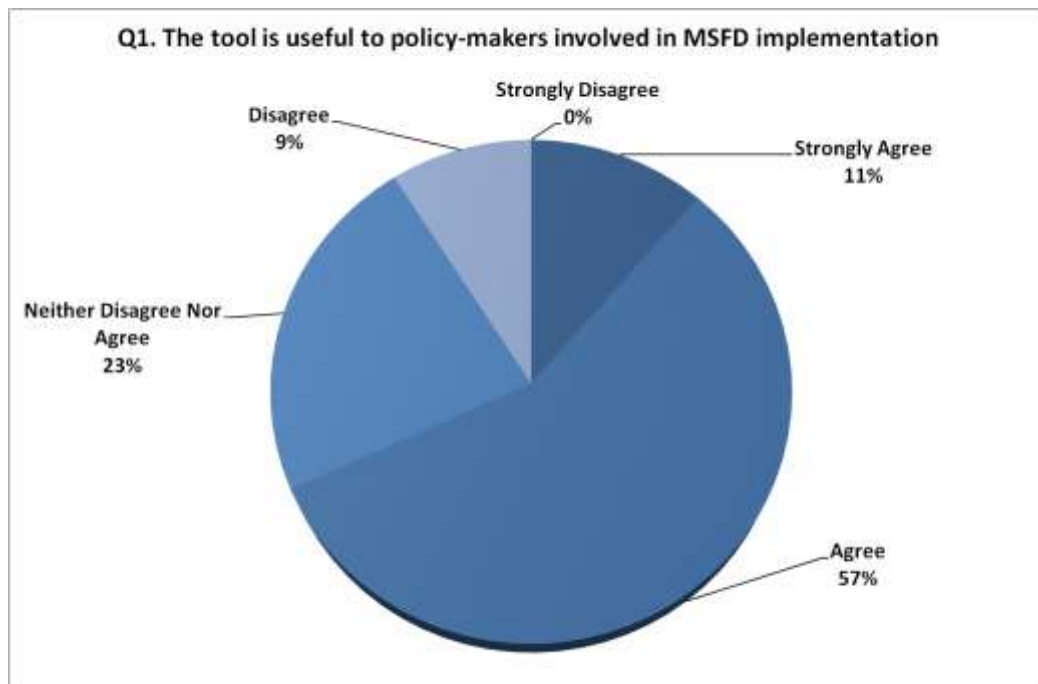
Figure 19: Answers to the assertion that the tool is useful to policy-makers involved in MSFD implementation.

More than half of the respondents (54%) stated that the AMP Toolbox target can be considered as well defined and clearly explained (Figure 10). Nevertheless, 23% of the sample disagreed, while the rest of the participants (23%) neither agreed nor disagreed.
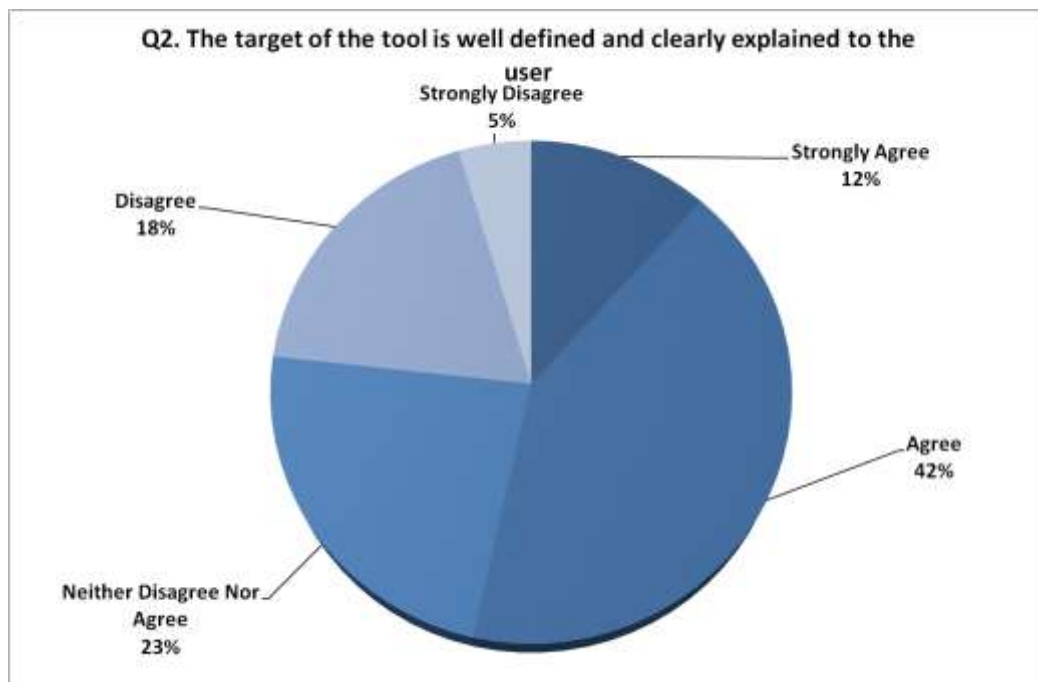
Figure 20: Answers to the assertion that the target of the tool is well defined and clearly explained to the user.

More than half (59%) of the respondents supported the conclusion that AMP Toolbox contains adequate information referring to its inputs (Figure 11).
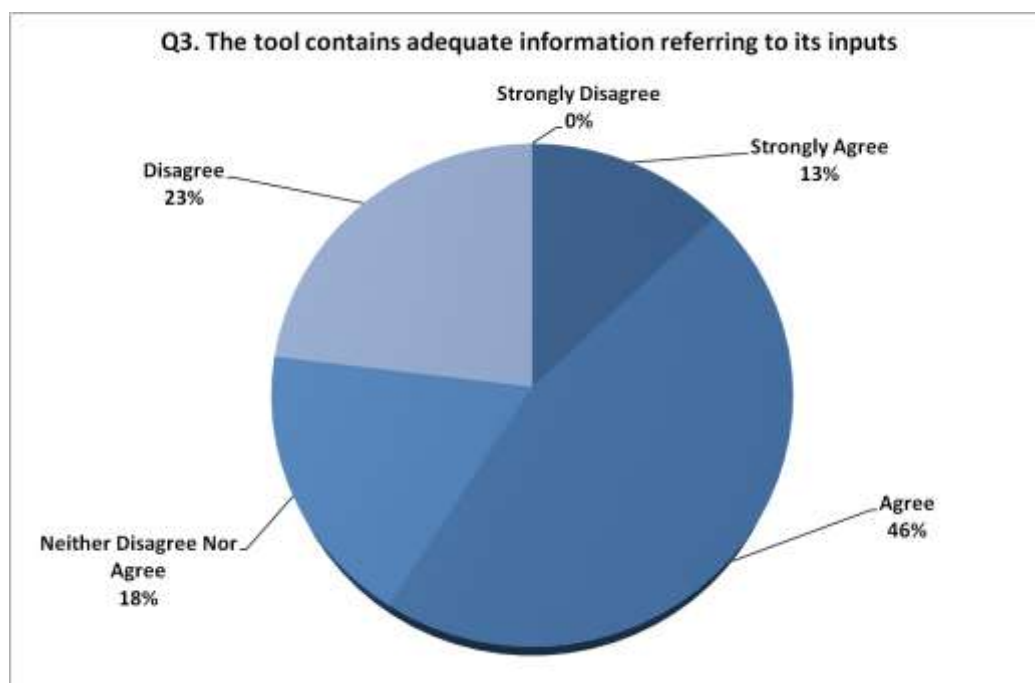
Figure 21: Answers to the assertion that the tool contains adequate information referring to its inputs.

The effectiveness of the AMP Toolbox was assessed for different types of stakeholders including scientists, policy makers, policy makers with a strong scientific background and general stakeholders including users with different abilities and experiences. According to the results as presented in Figures 12-15 the AMP Toolbox appeared to be more effective for the case of policy makers with a strong scientific background (60% of the respondents agreed with this assertion). Another 33% of the sample believed that the AMP Toolbox is efficient for policy makers; 35% of the sample considers the AMP Toolbox appropriate for general stakeholders including users with different abilities and experiences; lastly, 42% of the sample thinks that AMP is a sufficient toolbox for scientists.
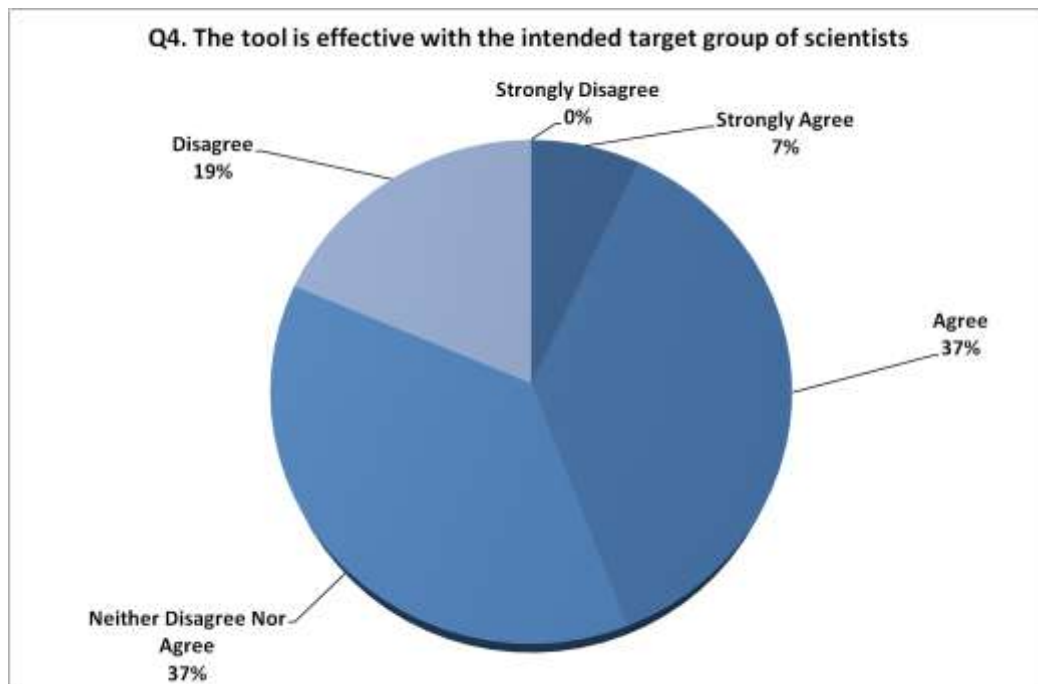
Figure 22: Answers to the assertion that the tool is effective with the intended target group of scientists.
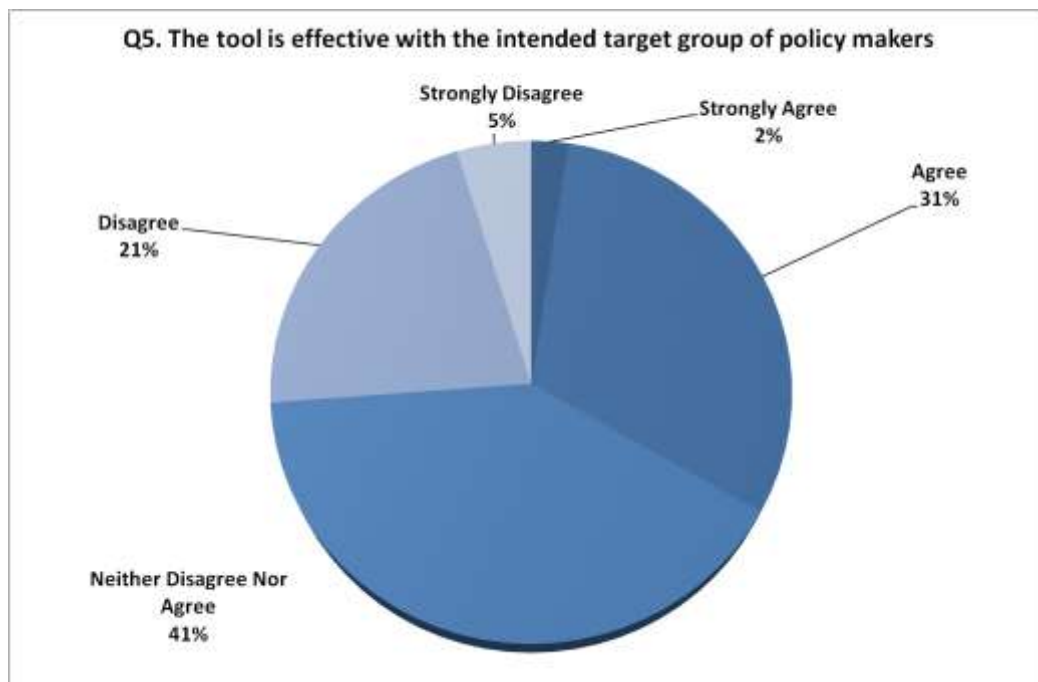
Figure 23: Answers to the assertion that the tool is effective with the intended target group of policy makers.
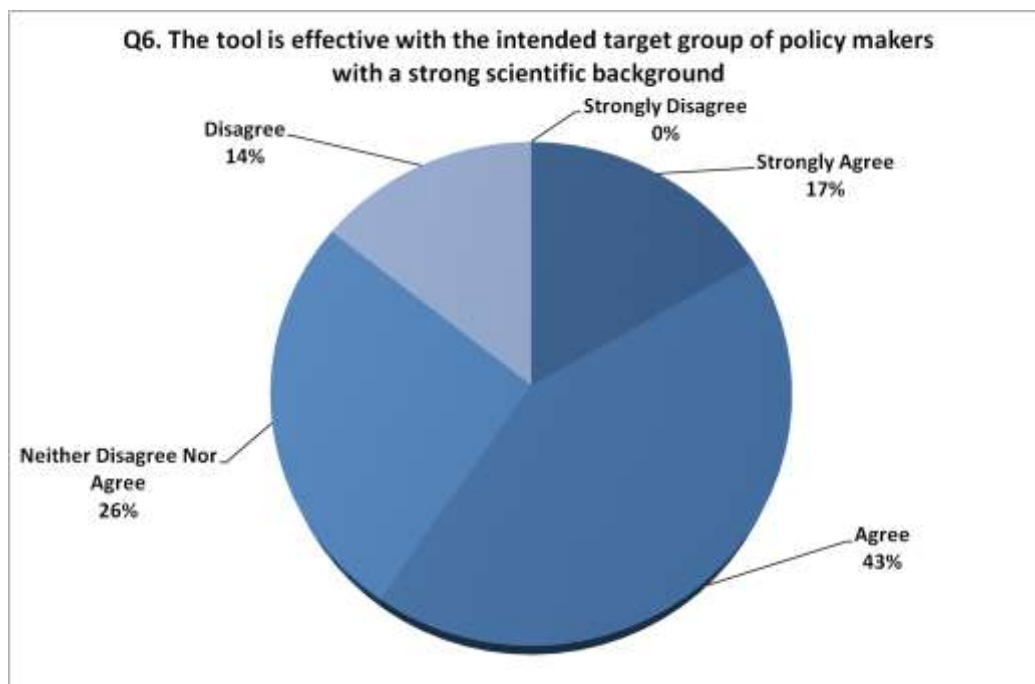
Figure 24: Answers to the assertion that the tool is effective with the intended target group of policy makers with a strong scientific background.
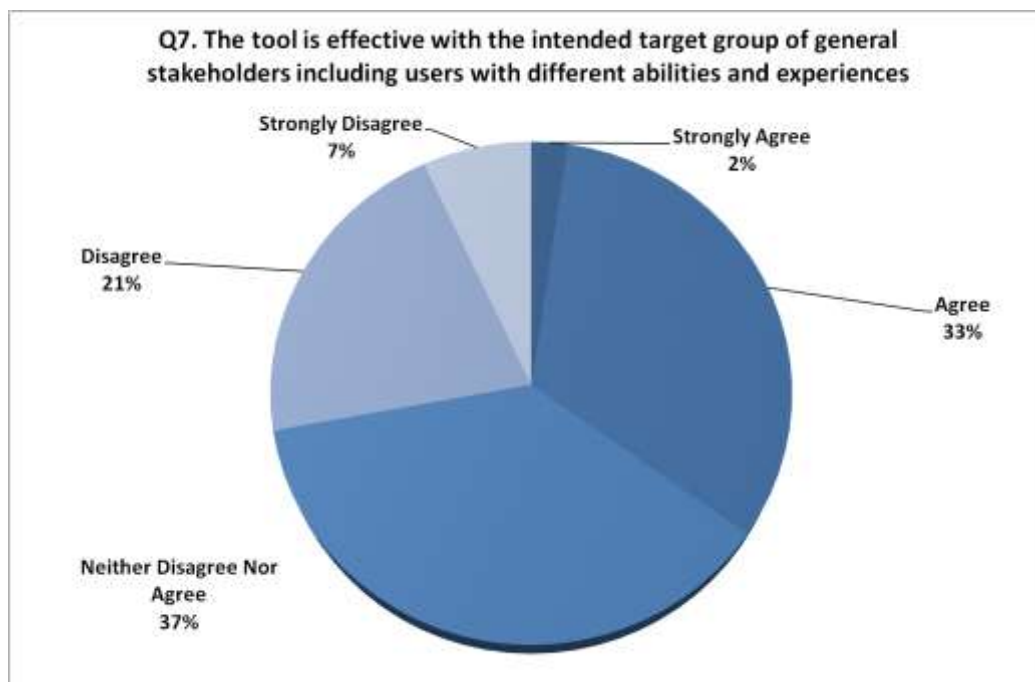
Figure 25: Answers to the assertion that the tool is effective with the intended target group of general stakeholders including users with different abilities and experiences.

Despite the fact that approximately half of the respondents appeared to agree that the AMP Toolbox could be characterized as comprehensive, 29% of them disagreed with the comprehensiveness of the AMP Toolbox, while 22% of them neither disagreed nor agreed (Figure 16).

Q8. The tool is comprehensive

Strongly Disagree 2%

Strongly Agree 5%

Disagree 27%

Agree 44%

Neither Disagree Nor Agree 22%
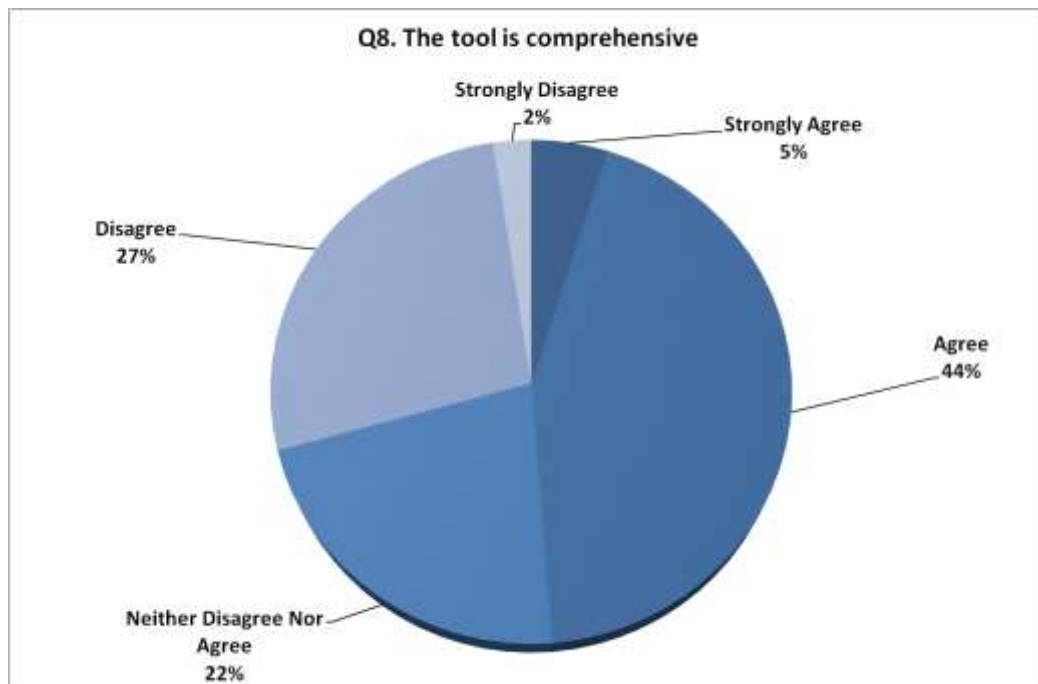
Figure 26: Answers to the assertion that the tool is comprehensive.

The same conclusion was confirmed during the evaluation of the attractiveness and the ability of the AMP Toolbox to motivate the user in order to utilize it (Figure 17). Specifically, only 41% of the respondents agreed while 40% of them disagreed, which is the highest percentage of disagreement within the performed evaluation procedure.

Q10. The tool is attractive and interesting so as to motivate the user to utilize it

Strongly Disagree 9%

Strongly Agree 5%

Disagree 31%

Agree 36%

Neither Disagree Nor Agree 19%
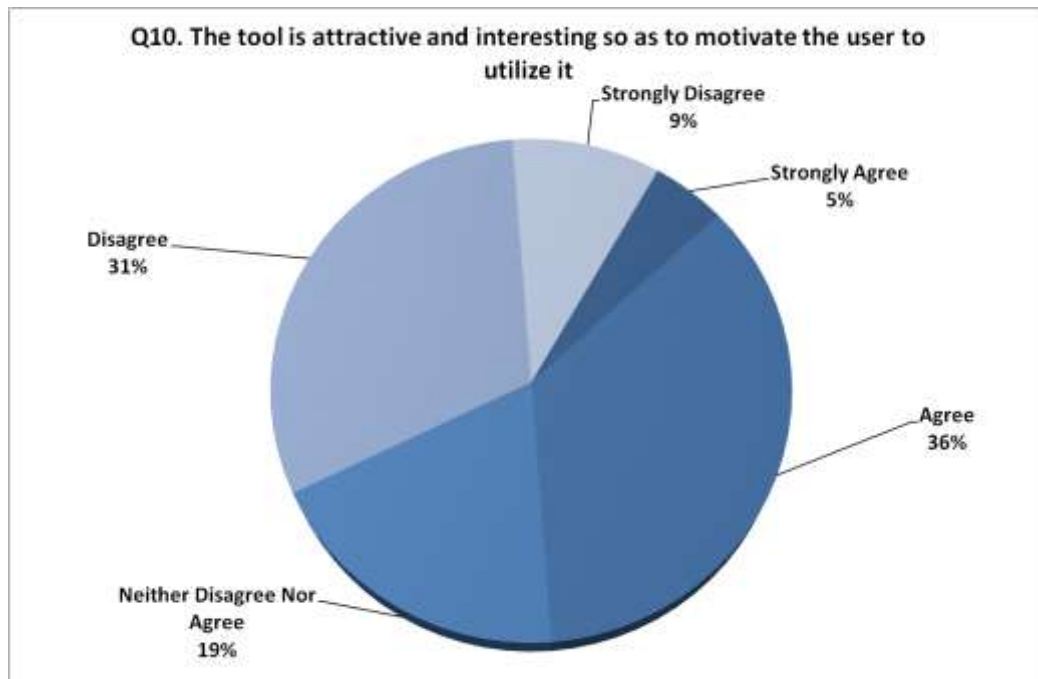
Figure 27: Answers to the assertion that the tool is attractive and interesting so as to motivate the user to utilize it.

Finally, 38% and 46% of the respondents neither agreed nor disagreed with the assertion that the AMP Toolbox performs its intended functions satisfactorily (Figure 18) claiming that there are no other similar tools available in this area (Figure 19). Nevertheless, 39% and 46% of the sample supported the above assertions.
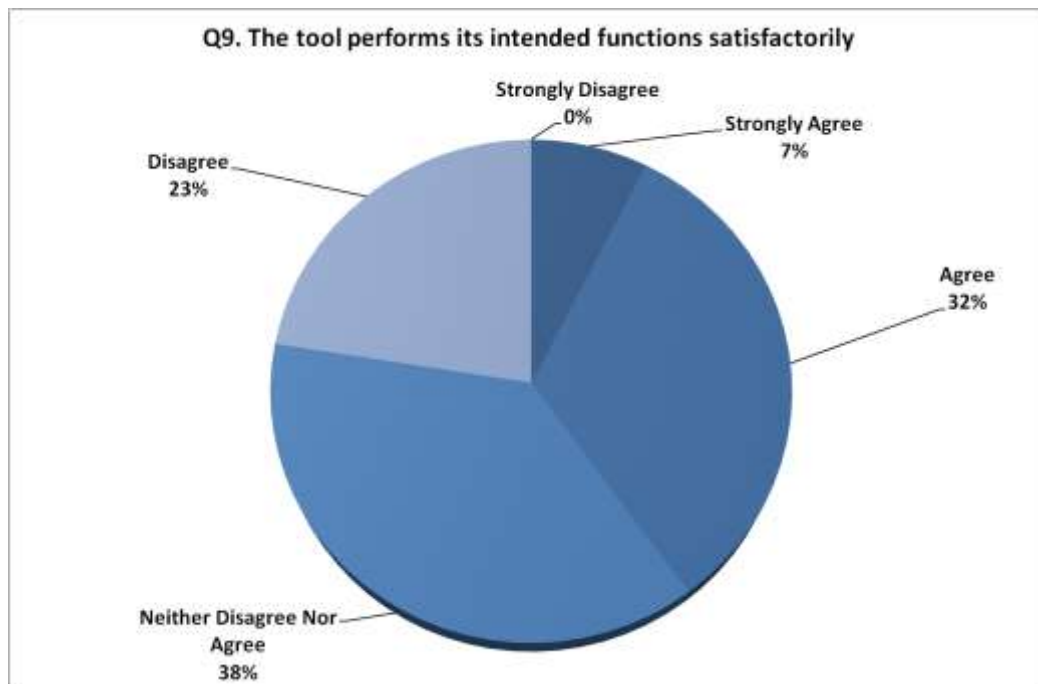
Figure 28: Answers to the assertion that the tool performs its intended functions satisfactorily.
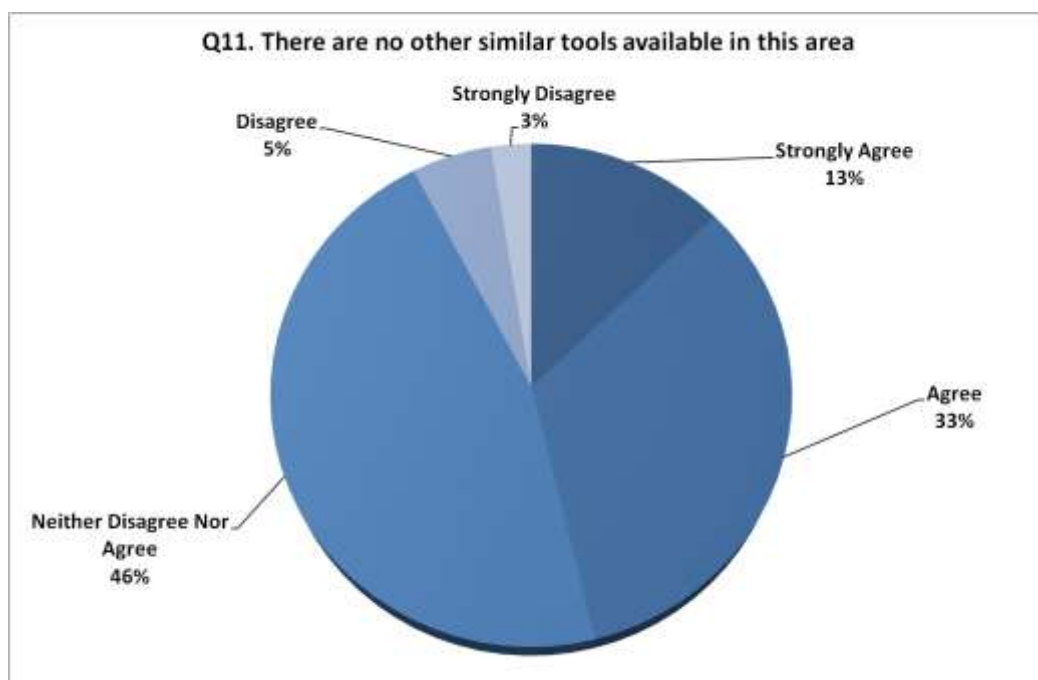
Figure 29: Answers to the assertion that there are no other similar tools available in this area.

Content

In the second section of the questionnaire the content of the AMP Toolbox was evaluated. The majority of the respondents (60%) agreed with the assertion that all important and policy-relevant issues are covered in a comprehensive manner (Figure 20). Nevertheless, 28% of them neither agreed nor disagreed, and only 12% disagreed.
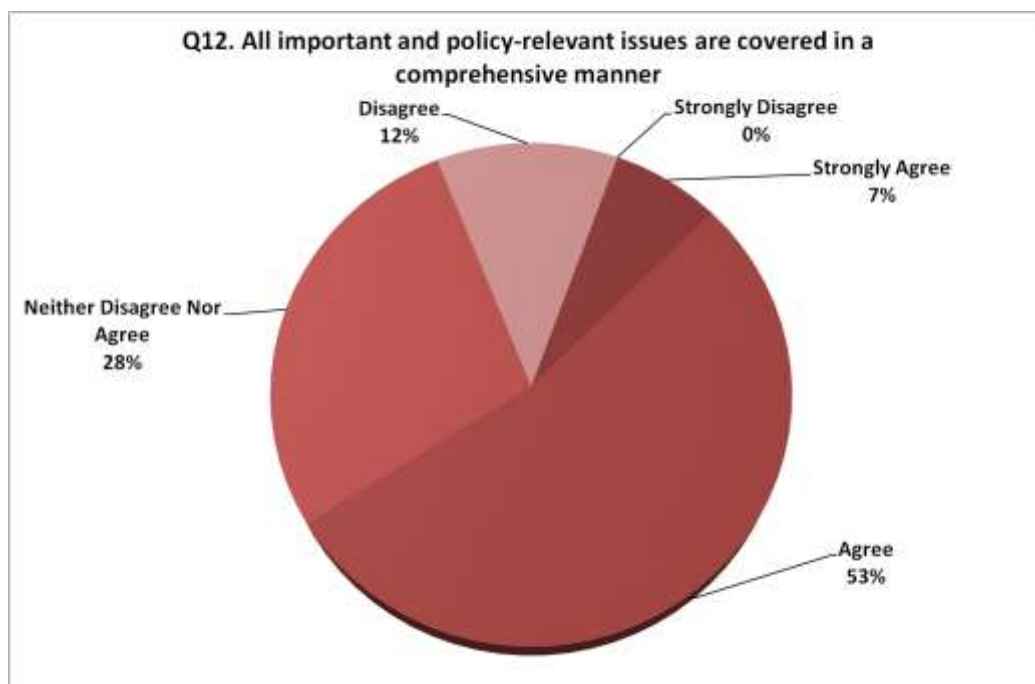
Figure 30: Answers to the assertion that all important and policy-relevant issues are covered in a comprehensive manner.

Towards this direction, 91% of the sample assessed the provided information as **valuable** fulfilling the main target of the AMP Toolbox (Figure 21). It should be mentioned that no one of the participants expressed disagreement toward this AMP component.
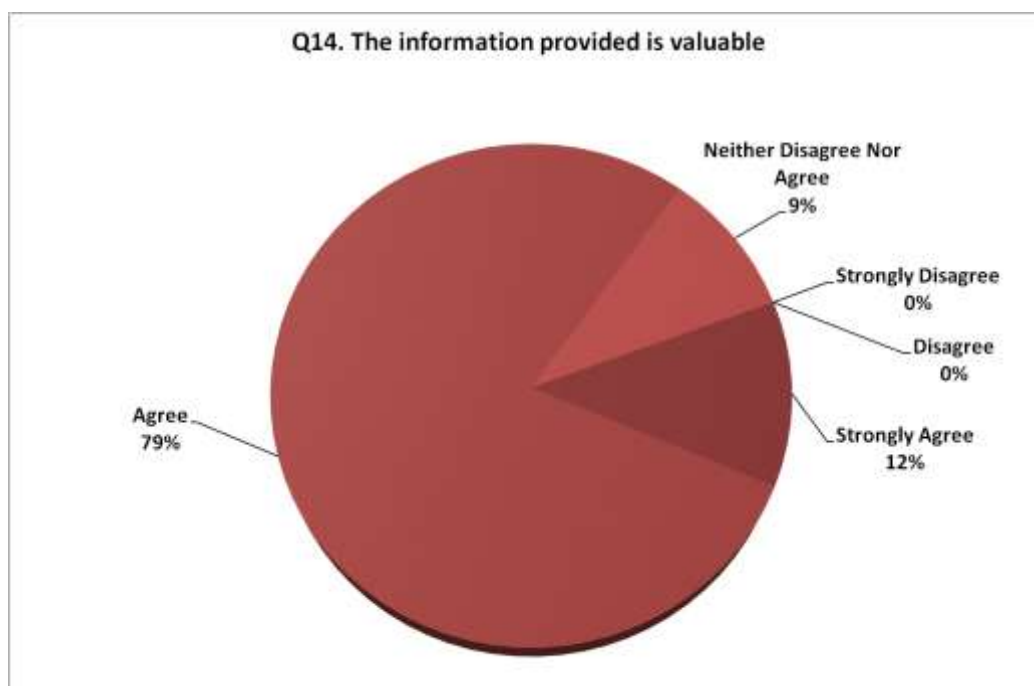
Figure 31: Answers to the assertion that the information provided is valuable.

Moreover, 28% of the respondents expressed the opinion that the provided information is not so clear, concise and well written and 25% reported that the structure of the AMP Toolbox is not clear, logical, and understandable to the user (Figures 22 and 23). These conclusions must be assessed in combination with the previously mentioned result that the AMP Toolbox seems to be not so comprehensive to the potential user. Nevertheless, 39% of the participants agreed with the first assertion and 47% with the second.
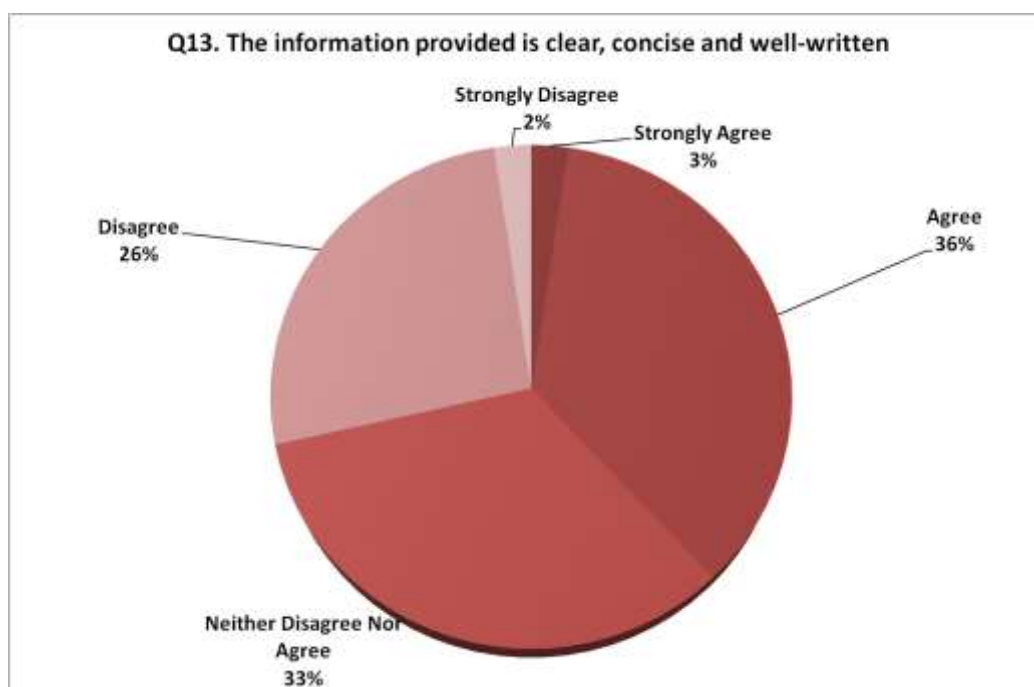
Figure 32: Answers to the assertion that the information provided is clear, concise and well-written.
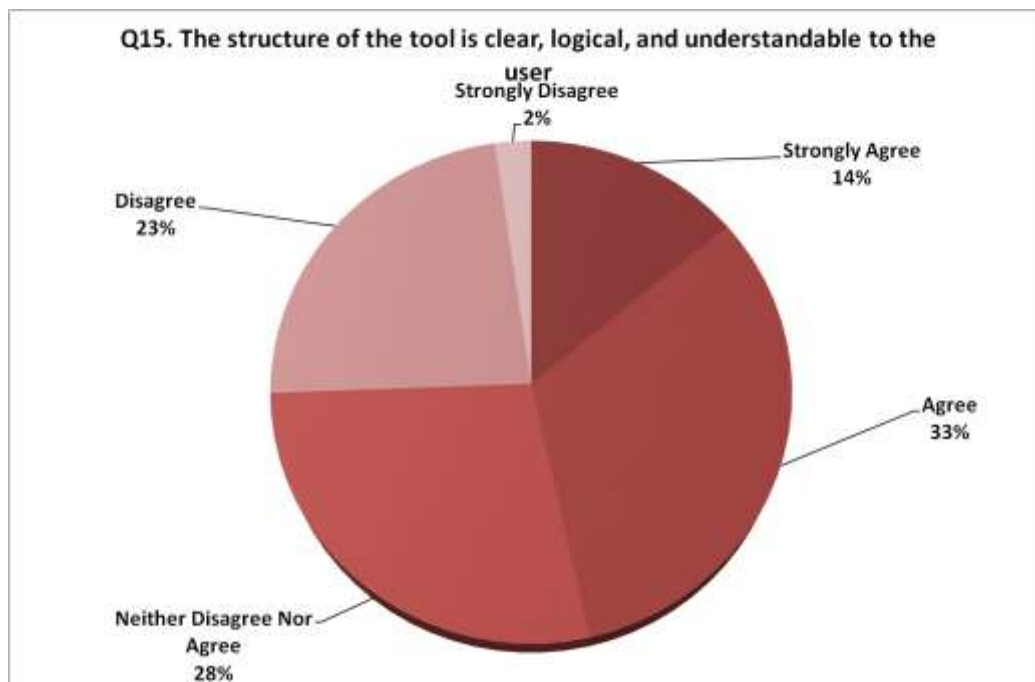
Figure 33: Answers to the assertion that the structure of the tool is clear, logical, and understandable to the user.

User interactions

Functionality of user interaction with the AMP Toolbox was then assessed. According to the results, almost half of the respondents (48%) agreed that the use of the AMP Toolbox functions can be characterized as easy (Figure 24). In contrast, 19% of the sample disagreed, while 33% neither disagreed nor agreed.
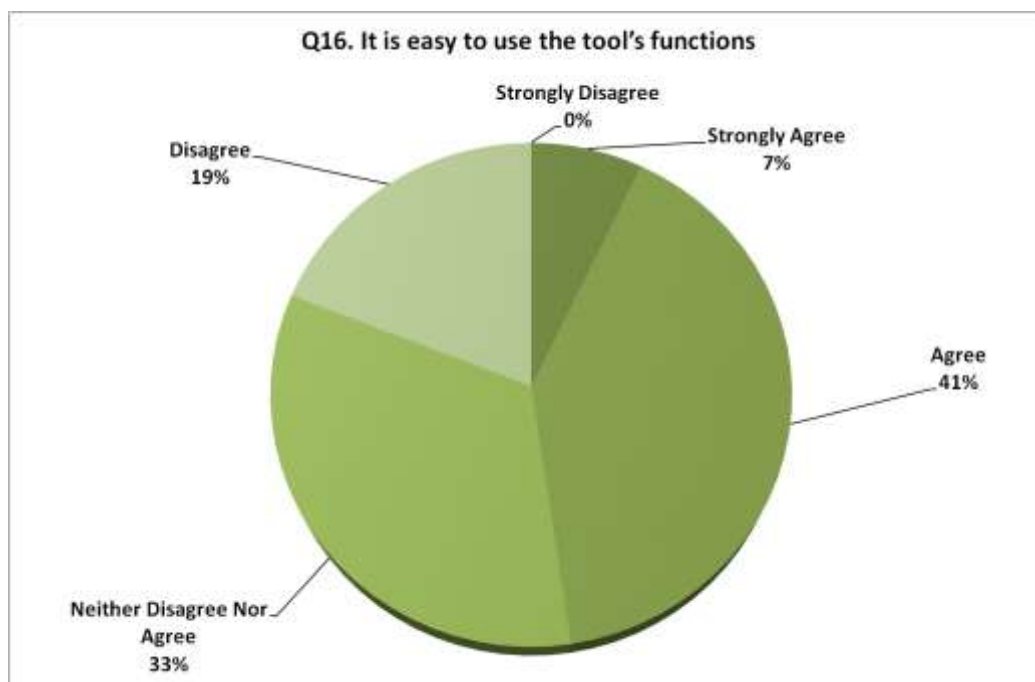
Figure 34: Answers to the assertion that it is easy to use the tool's functions.

A relatively high percentage of the respondents (27%) stated that the AMP Toolbox has not been categorized and organized in an efficient manner (Figure 25). Nevertheless, 41% of the sample highlighted the efficient structure of the AMP Toolbox, while 32% of the sample did not express either agreement or disagreement with this aspect.

Q17. The tool has been categorized and organized in an efficient manner

Strongly Disagree 3%
Strongly Agree 7%
Disagree 24%
Agree 34%
Neither Disagree Nor Agree 32%
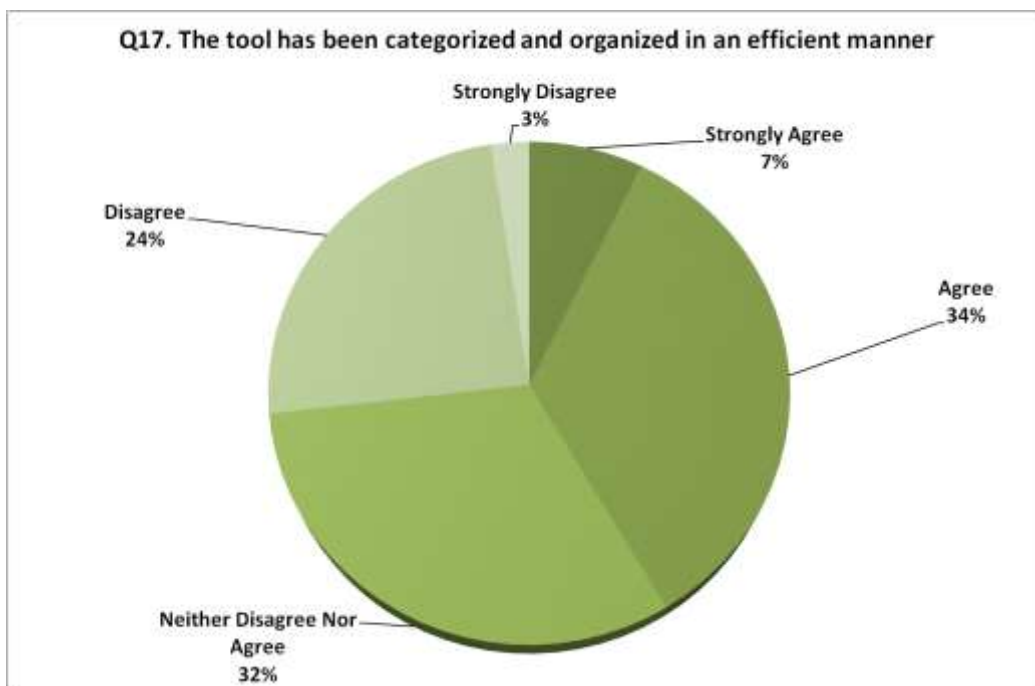
Figure 35: Answers to the assertion that the tool has been categorized and organized in an efficient manner.

Furthermore, as presented in Figures 26 and 27 the majority of the respondents stated that the user can easily access the sources provided in the AMP Toolbox (60% of the sample). An interesting aspect of user interactions highlighted is the choice of either going directly to the desired topic or use a structured approach to relevant topics (69% of the sample).

Q18. The user can easily access the sources provided in the tool

Strongly Disagree
0%

Strongly Agree
12%

Disagree
19%

Agree
48%

Neither Disagree Nor
Agree
21%
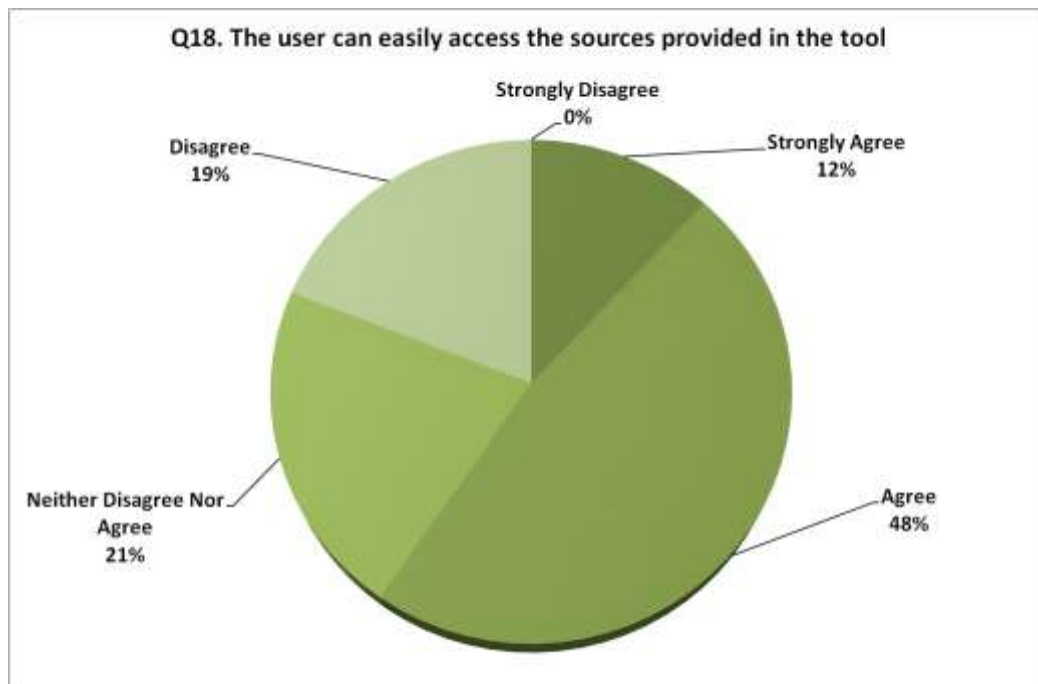
Figure 36: Answers to the assertion that the user can easily access the sources provided in the tool.

Q19. The user has the choice of either going directly to the desired topic or use a structured approach to relevant topics

Disagree
12%

Strongly Disagree
0%

Strongly Agree
15%

Neither Disagree Nor
Agree
19%

Agree
54%
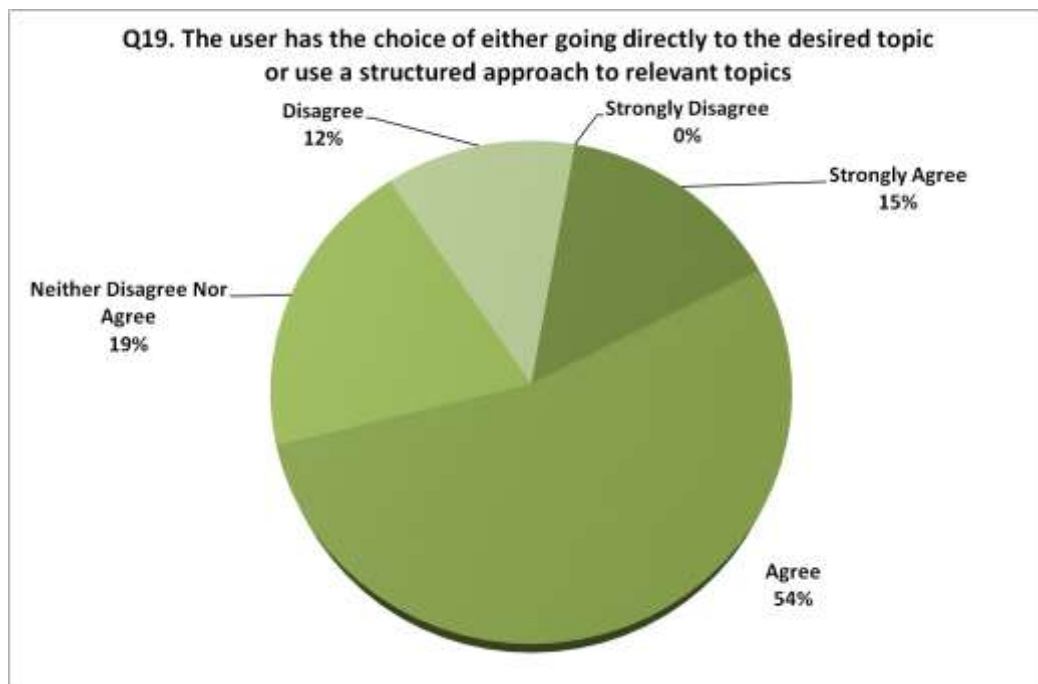
Figure 37: Answers to the assertion that the user has the choice of either going directly to the desired topic or uses a structured approach to relevant topics.

Almost half of the respondents stated that the navigational features of the AMP Toolbox are well constructed (Figure 28), while 17% disagreed and 31% neither disagreed nor agreed.
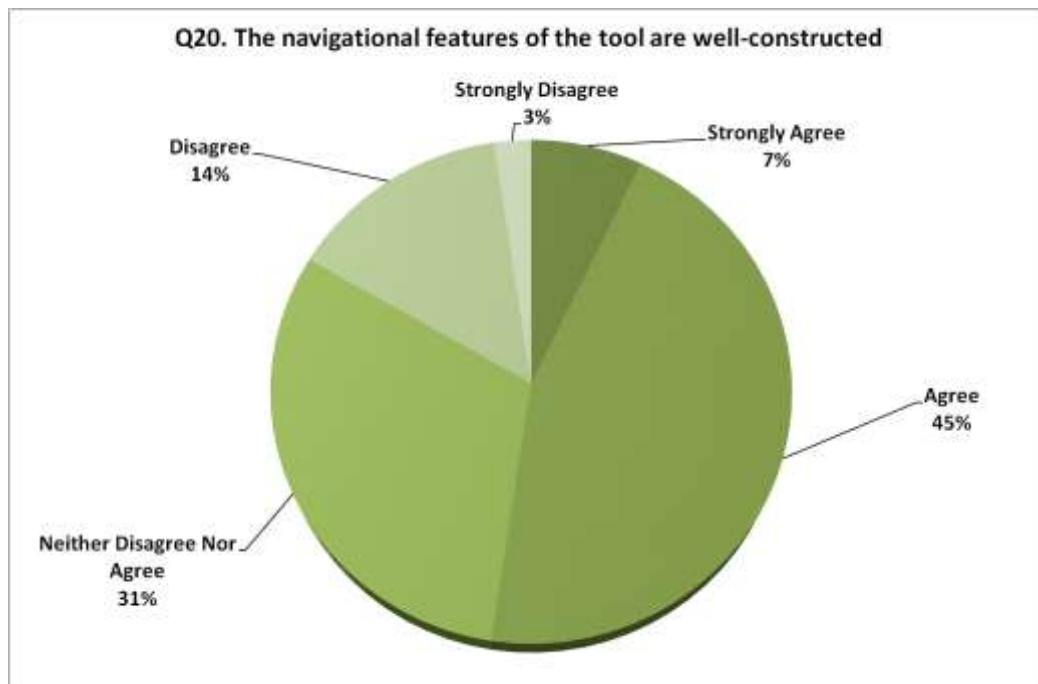
Figure 38: Answers to the assertion that the navigational features of the tool are well-constructed.

The majority of the sample (52% of the respondents) seemed to be confused regarding the ability of the AMP Toolbox to acknowledge the introduction of input data and to employ effectively the provided feedback (Figure 29). The relevant participants' percentages agreeing /disagreeing, equal 28% and 20% of the sample correspondingly.
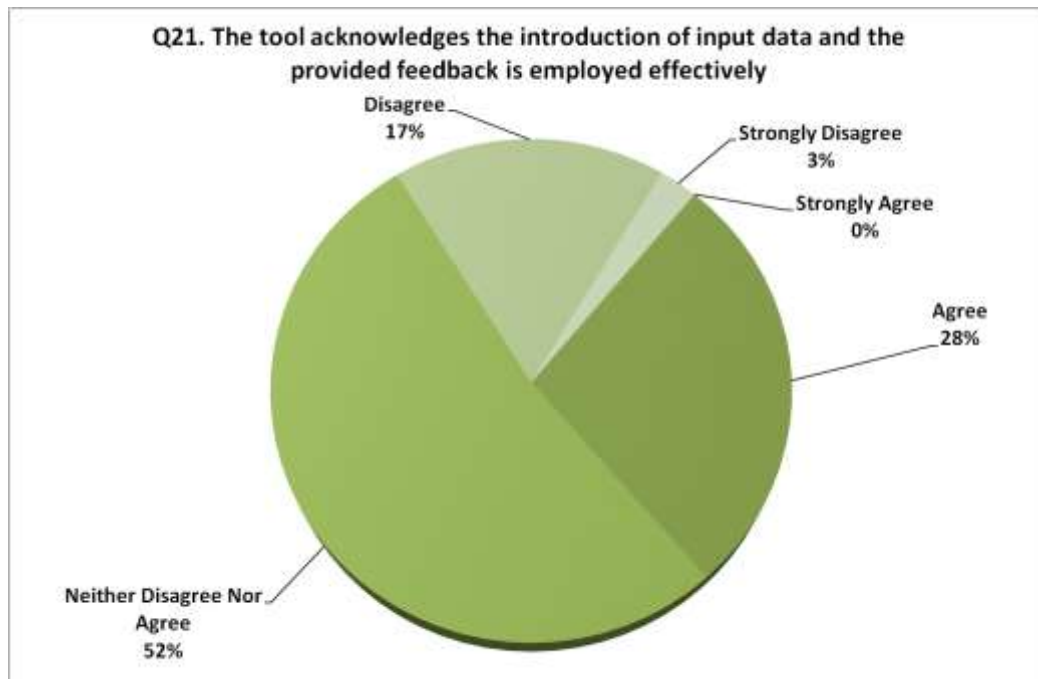
Figure 39: Answers to the assertion that the tool acknowledges the introduction of input data and the provided feedback is employed effectively.

Finally, 54% of the respondents agreed with the assertions that the retrieved information from the implemented searching queries is accurate and valuable (Figure 30).
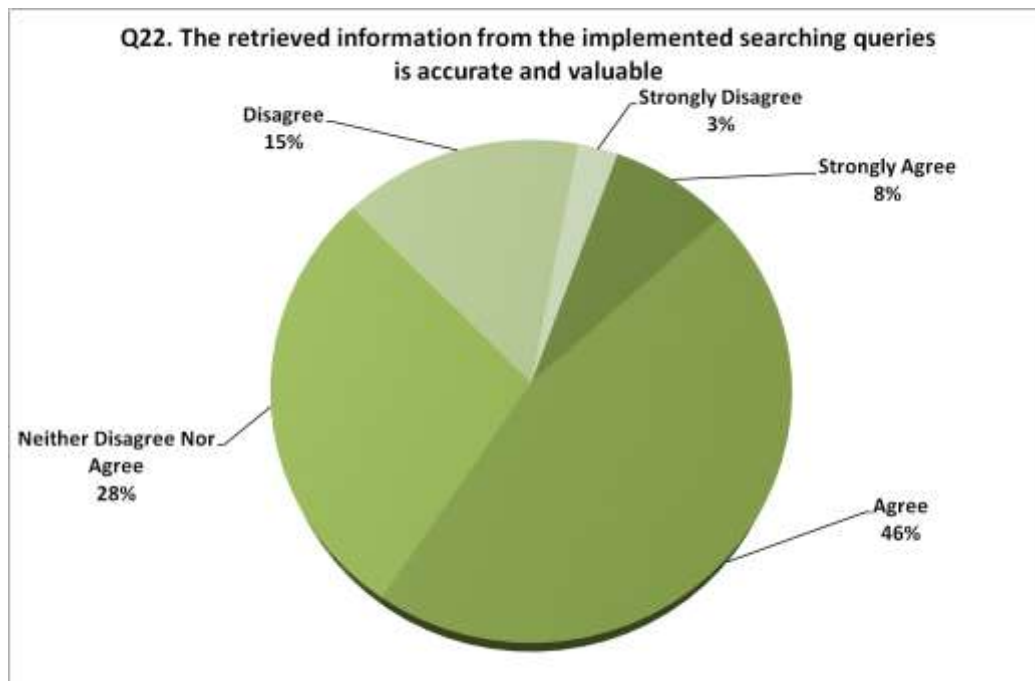
Figure 40: Answers to the assertion that the retrieved information from the implemented searching queries is accurate and valuable.

Technical aspects

In the current section of the questionnaire, various technical aspects of the AMP Toolbox were assessed. Specifically, 54% of the respondents claimed that the included workable interactive features such as forms and menus could be characterized as satisfactory, while only 16% did not agree with this option (Figure 31). Moreover, 30% of the sample neither agreed nor disagreed.
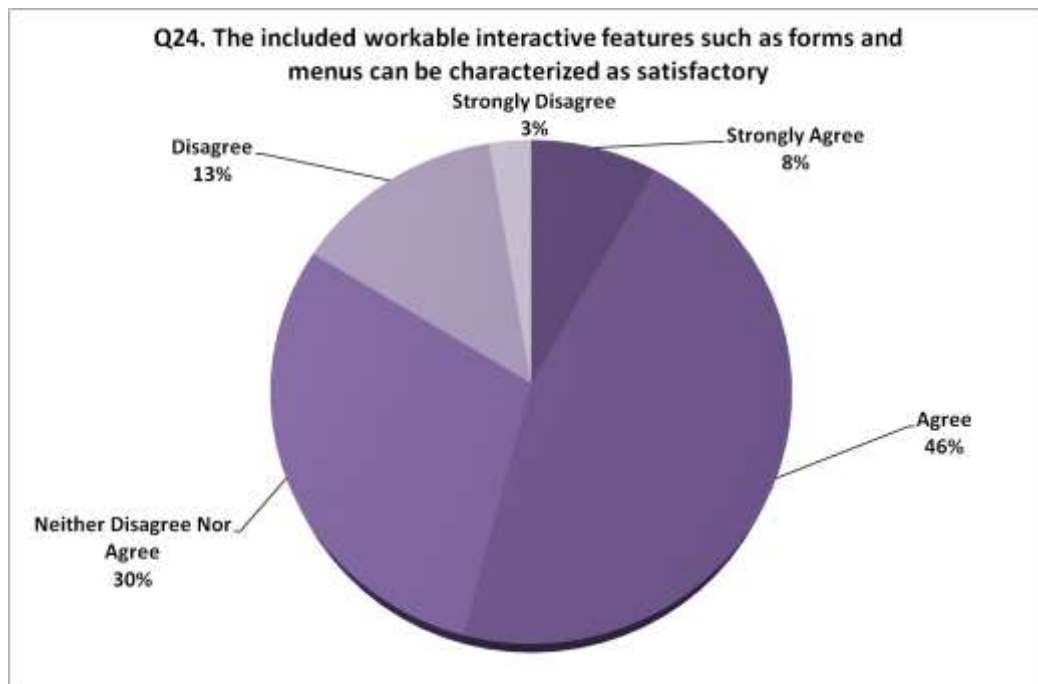
Figure 41: Answers to the assertion that the included workable interactive features such as forms and menus can be characterized as satisfactory.
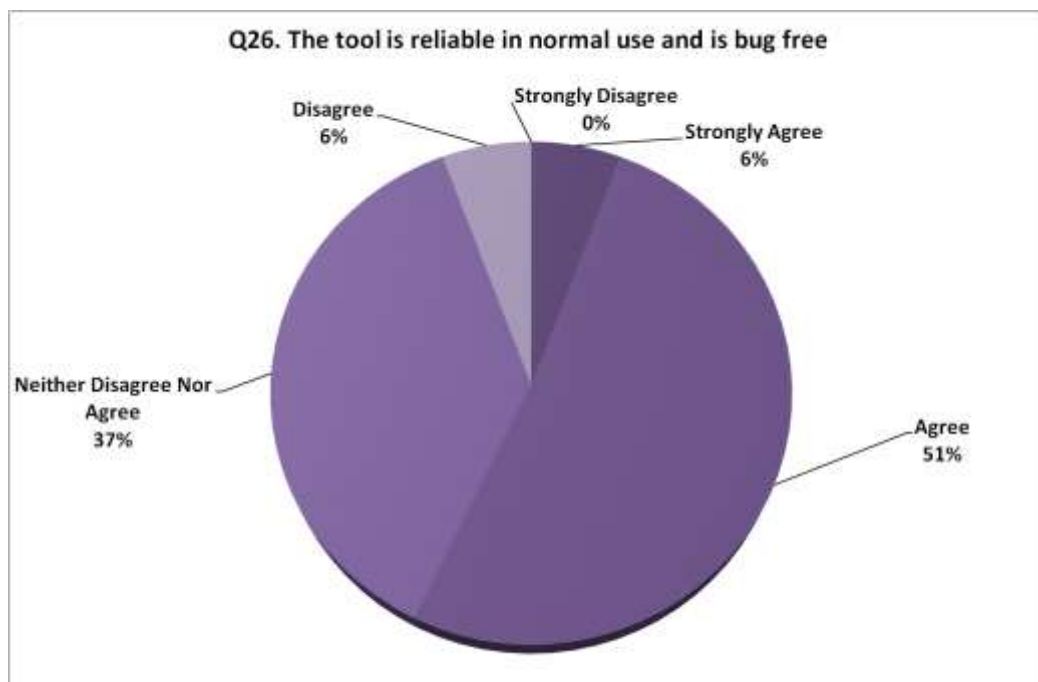
Figure 42: Answers to the assertion that the tool is reliable in normal use and is bug free.

Regarding the technical performance of the AMP Toolbox, 57% of the respondents supported the statement that it seems to be reliable in normal use and is bug free (Figure 32). 6% disagreed, while the rest of them (37% of the sample) neither agreed nor disagreed.

The respondents' majority (75%) confirmed that all the provided links are reliable (Figure 33), while 86% of the respondents stated that the time response of the AMP Toolbox could be evaluated as satisfactory (Figure 34) confirming the smooth and robust functionality of the AMP Toolbox.
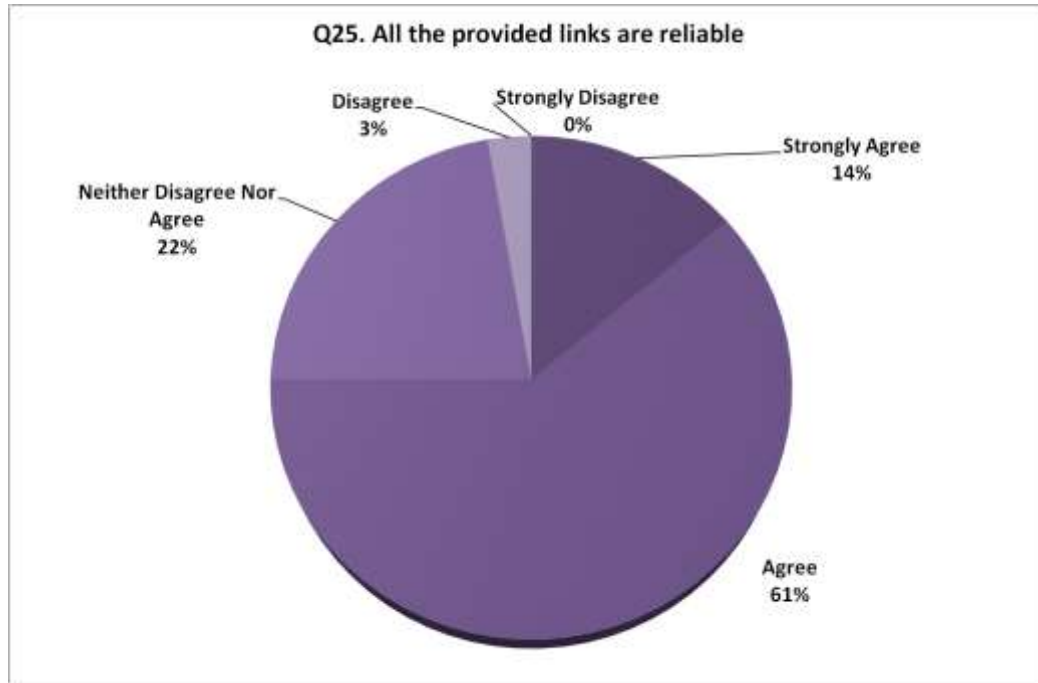
Figure 43: Answers to the assertion that all the provided links are reliable.
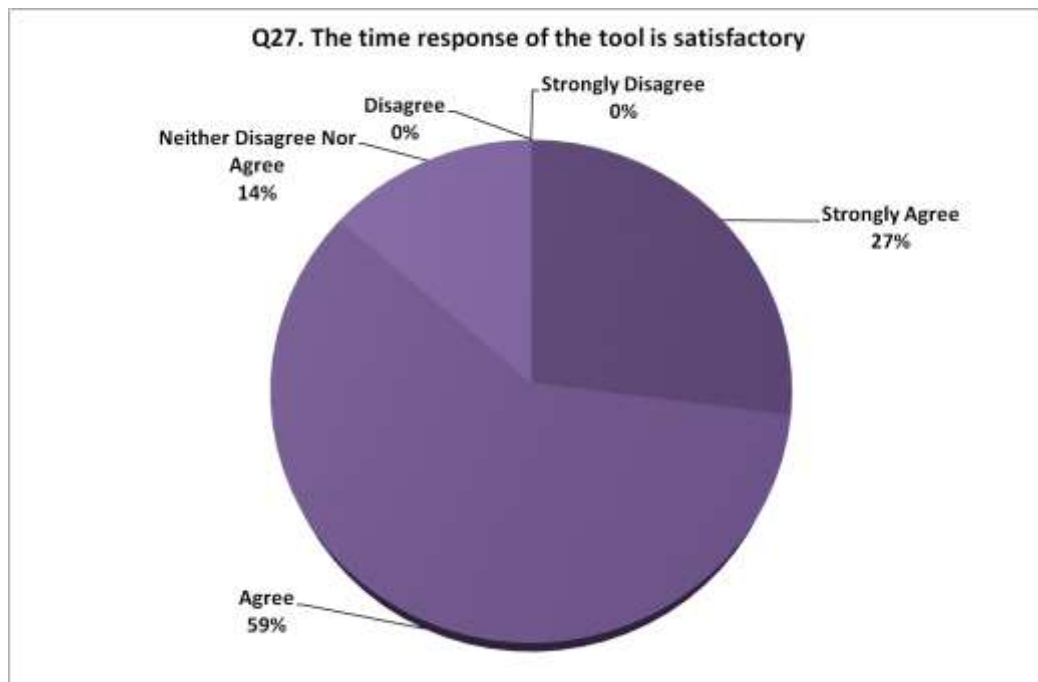
Figure 44: Answers to the assertion that the time response of the tool is satisfactory.

Support

In the final section of the questionnaire, the provided support services of the AMP Toolbox were evaluated. Almost half of the respondents neither disagreed nor agreed with the easiness and effectiveness of the AMP Toolbox to inform the developers about potential technical malfunctions (Figure 35) highlighting the significant opportunities for improvement. The percentages of the respondents, who either agreed or disagreed, were almost equal (28% and 25% of the sample correspondingly).

Q28. It is easy to inform the developers about potential technical malfunctions

Strongly Disagree 14%
Strongly Agree 3%
Agree 25%
Disagree 11%
Neither Disagree Nor Agree 47%
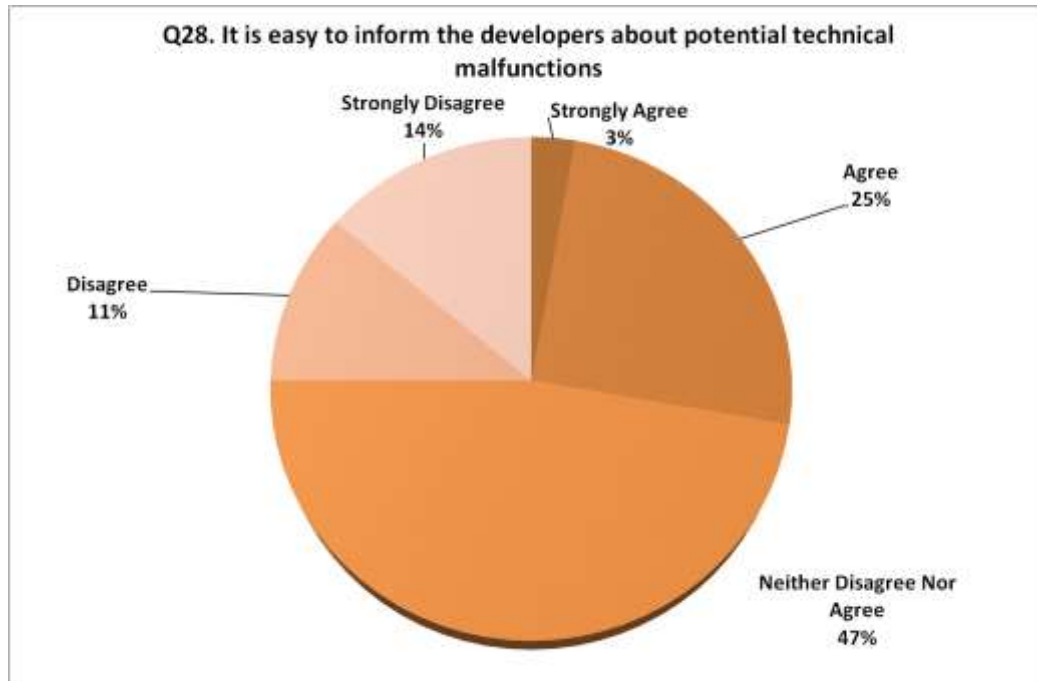
Figure 45: Answers to the assertion that it is easy to inform the developers about potential technical malfunctions.

Appendix III.e: AMP workshops presentation material

Presentation in Spanish-West Mediterranean Pilot Case - Adaptive Marine Policy Toolbox

Presentation in Spanish-West Mediterranean Pilot Case - Bluefin tuna example

Applications to management

1-Propose spatial planning management approaches

Spawning habitat mapping → Selection of closure areas To reduce accidental catch

Predicted spawning habitat (2003)

http://www.tbeg.ca/hooking-a-big-one/

Applications to management

2- Improve indices of adult abundance from larval data

+ Adult abundances->+Larval abundances

Larvae abundance in a year

Habitat quality

Habitat standardized LARVAE abundance indices

IMPROVING 15% C.V. (Ingram et al. ICCAT 2015)

Closing remarks

1- Spawning ecology of bluefin tuna highly **dependent** on regional mesoscale oceanography

2- Quality of input **Operational Oceanography** products {As sea surface salinity} determine applicability to fisheries management

3- Operational Oceanography products:

–Improve actual techniques for evaluation of adult stock abundance

–Open new ways for approaching Bluefin tuna management (spatial management)

REFERENCES

[References list — illegible]

Presentation in Western Black Sea Pilot Case - Turbot example

Adaptive Marine Policy
AMP Toolbox

STORYLINES

THE CASE OF THE TURBOT IN BULGARIA AND ROMANIA

STORYLINE:
Turbot in Bulgaria and Romania

- Major changes in the structure and behavior of the stock.
- Directly through the fishing pressure; and indirectly through the deterioration of the environmental conditions.
- Lack of a Regional Fisheries Management Organization.
- These factors make exploitation levels of most stocks exceed sustainable levels.
- Accordingly, to exploit this resource sustainably, adaptive policies are necessary.

STORYLINE:
Turbot in Bulgaria and Romania
STEP 1

STORYLINE:
Turbot in Bulgaria and Romania

STORYLINE:
Turbot in Bulgaria and Romania

STORYLINE:

Turbot in Bulgaria and Romania

STEP 2

Identify measures

Knowledge base: Database Measures Inventory

STORYLINE:

Turbot in Bulgaria and Romania

MARINE VALUATION

STORYLINE:

Turbot in Bulgaria and Romania

STEP 3

Check conditions warranting the use of adaptive management

1. Alternatives must be ecologically, economically, politically and legally feasible

2. Decision making needs to be iterative over time and possibly space to apply learning.

3. Clear and measurable management objectives must be identified. Objectives need to be measurable, so progress toward their achievement can be assessed.

4. Uncertainty can be expressed as a set of testable models to predict the effects of policy actions that are relevant to the objectives.

5. A monitoring system must be established to reduce uncertainty and measure progress towards accomplishing management objectives.

STORYLINE:

Turbot in Bulgaria and Romania

STEP 3

Forward looking analysis: assess policy success

Regional models: Scenarios to be modelled

Within PERSEUS sketches for future alternative scenarios within the Mediterranean and Black Seas have been developed.

This scenarios can be then turned into methods that can be as informal as a verbal description of system dynamics, or as detailed as mathematical expression of change, such as the models developed by the PERSEUS Project (soon available).

STORYLINE:

Turbot in Bulgaria and Romania

Design and implement a monitoring plan

Further readings: Marine Strategy Framework Directive Task Group 3 Report Commercially exploited fish and shellfish

It provides a Review of scientific literature and existing methods, including Fish stock assessment methods, Indicators and Monitoring programs.

Regional Assessments: Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status

It will be available for 2016.

The system should allow improving the knowledge on the behavior of the Turbot stocks. Apart for this technical learning, as mentioned above, the plan should also facilitate cyclical assessment and revision of the targets, as well as the rest of the elements of the policy.

STORYLINE:

Turbot in Bulgaria and Romania

STEP 4

Draw up an implementation plan

Further readings: Gantt charts

STORYLINE:

Turbot in Bulgaria and Romania

STEP 5

Evaluate on going policy

Participation tools presented before.

Adjust to new optimize issues

Establish corrective actions or adjustments to the policies in a simplified way according to the design and implementation process described in Steps 2, 3 and 4.

Presentation in Western Black Sea Pilot Case -Eutrophication example

STORYLINE:

Eutrophication in Bulgaria and Romania

STEP 3

Check conditions warranting the use of adaptive management

1. Alternatives must be ecologically, economically, politically and legally feasible.
2. Decision-making needs to be iterative over time and possibly space to apply learning.
3. Clear and measurable management objectives must be identified. Objectives need to be measurable, so progress toward their achievement can be assessed.
4. Uncertainty can be expressed as a set of testable models to predict the effects of policy actions that are relevant to the objectives.
5. A monitoring system must be established to reduce uncertainty and measure progress towards accomplishing management objectives.

STORYLINE:

Eutrophication in Bulgaria and Romania

STEP 3

Forecast problem analysis, assess policy success

Regional models: Scenarios to be modelled

Within PERSEUS sketches for future alternative scenarios within the Mediterranean and Black Seas have been developed.

This scenarios can be then turned into methods that can be as informal as a verbal description of system dynamics, or as detailed as mathematical expression of change, such as the models developed by the PERSEUS Project (soon available)

STORYLINE:

Eutrophication in Bulgaria and Romania

Design and implement a monitoring plan

Further readings: Marine Strategy Framework Directive Task Group 3 Report on Eutrophication

Regional Assessments: Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status

It will be available for 2016.

The system should allow improving the knowledge on the behavior of the ecosystems. Apart for this technical learning, as mentioned above, the plan should also facilitate cyclical assessment and revision of the targets, as well as the rest of the elements of the policy.

STORYLINE:

Eutrophication in Bulgaria and Romania

STEP 4

Follow up on previous applications

Further readings: Gantt charts

STORYLINE:

Eutrophication in Bulgaria and Romania

STEP 5

Evaluate on-going policy

Participation tools presented before.

Adjust to new relevant issues

Establish corrective actions or adjustments to the policies in a simplified way according to the design and implementation process described in Steps 2,3 and 4.

Presentation in Black Sea Commission- The need for AMP

PERSEUS

Adaptive Marine Policy Toolbox to assist Decision Makers in Env. Management

Black Sea Commission Meeting,
Istanbul, 3 November 2014

M. Skourtos & A. Kontogianni

PERSEUS

The Value of our seas

World economy depends on OCEANS for 50% of its natural gas and 30% of its crude oil.

Raw materials and food of the marine environment had a market value of 1.6 trillion (US dollars1994).

Total economic value of ocean and coastal ecosystem 22.6 trillion (US dol) or 68% of the global GDP, whereas terrestrial ecosystems' worth is estimated at 10.7 trillion (Costanza et al 1997)

PERSEUS

POLICY MAKING

HOW TO MANAGE

SUCCESSFULLY THESE VALUABLE

RESOURCES?

PERSEUS
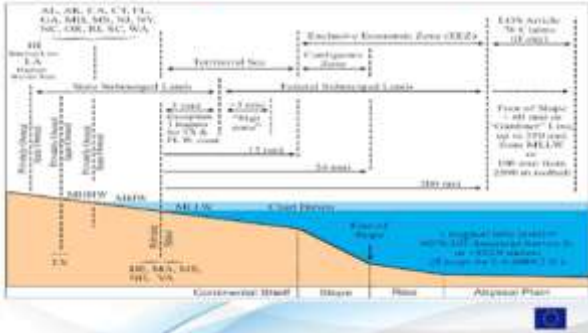
A complex situation

PERSEUS
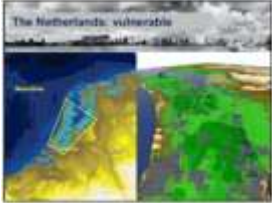
Becoming even more complex
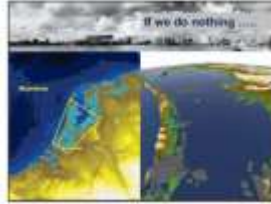
NOT IGNORING THE CLIMATE CHANGE

The Netherlands disaster case (Mollema, 2009).

The policy context

STAKEHOLDERS

European Institutions

National Institutions

POLICY MAKERS

Lobbies

SCIENTIFIC COMMUNITIES

PERSEUS

How does a policy maker looks like under these circumstances?

PERSEUS

The SOLUTION

AMP TOOLBOX

http://www.perseus-net.eu/en/about_the_apf_toolbox/index.html

THE QUESTION:

DOES AMP TOOLBOX IS TOO SOPHISTICATED FOR POLICY MAKERS?

DO WE WISH FOR A SCIENCE –BASED DECISION MAKING OR FOR A SIMPLE RECIPE ?

WHAT KIND OF POLICY MAKING WE LIKE FOR OUR FUTURE?

PERSEUS

PERSEUS

AMP Toolbox development is the main GOAL within WP6 PERSEUS

Where we stand now in AMP Tool development?

16.4 Implementations and lessons learned until September 2015

Difficult to quantify the effectiveness of policy measures and assess their cost.

Adaptive Policy Framework Tool Box Structure

· HOW Guiding policymakers designing and implementing adaptive policies in 4 levels.

MAIN PAGE

STEPS
1. SET THE SCENE
2. ASSEMBLE THE BASIC POLICY
3. MAKE POLICY ROBUST
4. IMPLEMENT THE POLICY
5. EVALUATE AND ADJUST POLICIES

KEY ACTIVTIES
To accomplish each step
Make your choice!

RESOURCES
- Knowledge base
- Regional models and assessments
- Tools and methods
- Further readings

Poster Saronikos Gulf -Aegean Sea

Appendix III.f: A Roadmap for AMP Toolbox experimentation

A Roadmap to the Implementation and improvements of the AMP Toolbox Tests at Pilot case level

M. Skourtos, A. Kontogianni, D. Damigos and C. Tourkolias

1.   Introduction

According to PERSEUS DoW, Task 6.4 aims at testing and improving the Adaptive Policy Framework toolbox (hereafter: AMP TB) designed and developed within Task 6.3. The main objective of Task 6.4 accordingly is to test the AMP:

- ➢ At the Pilot Cases (hereafter: PCs) (NWMed, Adriatic, Aegean Sea, W. Black Sea)

- ➢ And at the basin scale

- ➢ For coastal and

- ➢ Open sea applications

Test applications will mainly focus on elaboration of adaptive policies aiming to overcome situations at risk of non-achievement of the GES during the 2020-2030 horizon and will be developed using a participative approach involving stakeholders and as far as possible scientists specialized in these kind of risks. From the lessons learned in the PCs, the framework will be finalized so as to ensure its suitability for policy planning at various scales in support of reaching marine GES in the context of the Sustainable Development of the EU riparian countries.

The rationale of testing the AMP - as stated in the DoW and discussed more than once in the GA and SSC meetings - is to empirically verify the use and suitability of the AMP TB for the elaboration of future programs of measures in the framework of the WP6 Pilot Cases. Moreover, the AMP TB have to verify its integrated nature by being able to link to scientific modelling and other scientific resources produced by PERSEUS, justifying its character of a policy oriented project. The test of AMP should also shed light on how well the transition from one policy step to another facilitates (or necessitates!) a 'chain reaction' between socio-economics and scientific models and tools.

Research on Task 6.4 extends from Jan 2014 (T25) to Nov 2015 (T47). Responsible partner is AEGEAN and participants are: Plan Bleu, DELTARES, CMCC, ECOLOGIC, PML, BC3, BSNN, TSU, UU, CSIC, UoP.

Research within task 6.4 will lead to the production of four Deliverables:
D6.13: Reports on the experimentations in the Pilot Cases Due T34 [AEGEAN]

D6.14: Report on the experimentations at SES basin scale Due T42 [BC3]

D6.15: AMP, final report on expectations issued by the SES stakeholder platforms

Due T42 [PB]

D6.16: Synthesis report   Due T47 [AEGEAN]

The present note aims at developing and proposing a coherent and manageable scheme for organizing the test and the subsequent improvements of the AMP at the level of Pilot Cases. It might be proven useful for organizing the test also on the level of the basin scale but this is something to be decided only after a certain experience has been gained and primarily by the partner leading the corresponding deliverable (BC3). In this note we give a short description of AMP (the 'object" of the test) (section 2), deliberate on the meaning of the 'test' (section 3), present our thoughts on the structuring of the test process and its organization (section 4), give a first, tentative structure of Deliverable D6.13 (section 5) and conclude with a timetable and next steps (section 6).

2.   What are we testing?

The AMP TB has been designed and developed within Task 6.3. Results and progress has been laid down in Deliverables D6.7, D6.9, D6.10 and D6.11. Research on aspects of AMP is still on-going but its main features are already there: AMP TB is a set of tools intended to assist policy-makers involved in implementing MSFD in matters of:

➢ Structuring policy responses

➢ Delineating institutions and actors involved

➢ Accessing available data and information

➢ Becoming aware of alternative policy instruments and their relative merits

➢ Designing policy scenarios to visualize alternative outcomes

➢ Evaluating alternative outcomes

➢ And - because it is adaptive – elaborating policies intrinsically robust to change.

The "tools" in the AMP are meant to facilitate the communication of scientific knowledge and the use of scientific information in deliberation processes and consist of:

•   Project management tools that assist policy makers to regularly check consistency and performance of policies.

•   Tools and strategies for monitoring of those key-indicators that can help trigger important policy adjustments to keep the policy functioning well.

•   Tools and strategies for evaluations of the performance of potential policy adjustments.

PERSEUS has already produced a number of (internal) tools such as:

•   Seven databases produced within WP6 and forming the "knowledge base"

•   Information and knowledge on the main risks of non-achievement of the GES provided by WP1 (open sea) and WP2 (coastal areas)

•   Pressures in socioeconomic terms on the marine and coastal ecosystems by the WP1 (open sea) and WP2 (coastal areas)

•   Model results from the WP4

The organization of tools follows the logic of the 5-step adaptive policy cycle elaborated in detail in D6. 7.

NOTA BENE 1: A central element in AMP is its adaptive nature. Our test therefore, in order to be worthy of its name, should lay special emphasis on those elements of AMP which support adaptive decision-making!

NOTA BENE 2: The AMP TB is yet to be finalized. What we are testing in the PCs is a preliminary, "beta" version of the final product. The purpose of the test is to help finalize the AMP in a usable, user friendly way.

3.   The meaning of the 'test'

By "test" we practically mean exposing the AMP in a simulated, hypothetical but realistic situation, where an agent is called to address a problem in marine governance using the AMP as a support device. The test will be a preliminary assessment of AMP TB in order to: demonstrate its utility; try out procedures; evaluate its implementation and the results; and make any needed changes or adjustments. To this end there are some critical steps, as follows:

•   Develop a "hypothetical but realistic situation"

•   Familiarize the participants with the functionalities of the AMP TB

•   Collect feed backs on the functionality of the AMP TB.

•   Report the results and highlight deficiencies

•   Propose and implement improvements

We explain further:

By "agent" we mean a member of a regional PERSEUS SH platform having a specific interest in policy making for aspects of marine management in the PC. 'Agents' are therefore members of the regional SH platforms active in the AMP TB testing and improvement. Depending on the organization of the test (see section 4 below) we may need one or more agents in face-to-face or, alternatively, group meetings. We assume that the chosen agent(s) is (are) representative (in terms of skills, targets, awareness and constraints) of those state employees in the PC charged with the responsibility of implementing the MSFD or stakeholders having interest to develop policy options in the field of marine environment. In cases where not sufficient policy-makers are committed for the test, we should think a way out: we could, for example, implement a partial test of AMP focusing on some policy steps with one,

busy and difficult to get on the phone, policymaker. We can then try to complete our missing data by contacting other stakeholders, with or without a formal policy-making property (e.g. NGOs) but a real interest in marine governance.

Three factors are important in selecting agents for the purposes of the test:

• The vicinity of agent to a real, decision-making authority

• The extent of agent's prior experience in developing or implementing new tools, practices, etc.

• The willingness and availability of agents to participate in the test

The selection of suitable agents who are interested in testing the types of practices that are planned for the AMP TB test will help to ensure the successful implementation of the test. By "problem" we refer to an "issue at risk" as defined and described in the PERSEUS research for the PCs and presented in the PERSEUS Factsheets. In case that our agent's priority and interest lies within another issue of marine governance and he prefers to use this as the base of the AMP test, then we agree and continue. Do not forget: it does not pay to insist on using the 'issues at risk' identified by PERSEUS when our agent wishes otherwise; if we do, we probably jeopardize his commitment! By using the term 'problem' we do not want to imply that our test, in order to be successful, must deliver the solution to the problem! Of course, testing the AMP all the way through the five policy steps unavoidably means that we will talk about solutions (the program of measures). No matter how we welcome an outcome where our test ends with a clear solution to the issue investigated, we nevertheless also welcome an outcome where gaps and drawbacks of AMP have been highlighted.

By "hypothetical but realistic situation" we mean a problem setting that anticipates a future or addresses a current issue and its solutions. The problem setting can be visualized as a "what if" scenario that describes the problem and its possible solutions (the 'program of measures') in all five steps of the policy cycle. The setting is realistic if it is anchored in a solid knowledge of the local conditions and habits in matters of state intervention and marine management practices.

By "simulated" we refer to setting in motion the five cycles of AMP by the agent in a deliberative mode to structure the issues and choose response policies. We build them into appropriate MSFD-scenarios and visualize their outcome. We score the performance of policies by suitable indicators: How effective? How efficient? How quick? The simulation (which is practically the test) can take place either in a face-to-face, interview-like setting or in a group fashion. In all cases, stakeholder deliberation is important! Deliberation means that we interact with the agent through observing, asking, noting, correcting, advising, explaining but not biasing the discussion!

4. Structure and organization of the test process

Before we embark on the test itself, we need a thorough and careful design of its structure and organization. The following steps are tentative answers to this task:

Step 1: Do your homework!

Before the test begins, the PERSEUS person(s) involved (hereafter: facilitator and relevant team) must be prepared to answer several questions referring to difficulties that pop up during the process. A facilitator must study thoroughly the spirit and technicalities of the AMP TB as presented in the relevant deliverables: What is an AMP TB? What are the (internal and external) tools? How does the web-based platform of AMP look like? Who can use the tools and how? What skills are required? What does AMP deliver? Does it include ready-made solutions? Does it include tools specific for this PC (i.e. models and databases)? Can we run scenarios? What use can be made of the several databases? What is 'adaptive' in the AMP? Why is this characteristic important?

More important, she/he must be aware of the overall marine governance in the PC, the issues in the local policy agenda, the pattern of regional pressures as elaborated in the work of WP1 and 2, their characterization in socio-economic terms, the institutional setting, the degree to which regional policy-making traditionally requires scientific inputs, the availability and interest of SHs in the regional SH platform, the appropriate timing to contact SHs, etc etc. We should not forget that the 'raison d'etre' of the AMP TB is to help MS implement their 'program of measures' by 2015.

Step 2: Select your agent(s)!

Task 6.2 in WP6 has advanced considerably our knowledge about Med and BS SHs. Especially D6.12 in its current form (see D6.12_v0_updated.doc) offers a wealth of information on how SHs perceive the SES policy arena and their aspirations about decision support tools like AMP. A close look at the SH platforms, enriched with information on SH identification (PERSEUS_Stakeholder_Identification_V18_140214) will give you a good idea of who is suitable to participate in the test. Choosing the relevant agency / person is a matter of the following parameters: position in the decision-making unit, interest, scientific skills, availability, easiness of contact, etc. At the end, the choice of the agent will probably boil down to the question: who is willing to follow the "test" for a period of time and commit himself to do it? By 'commit' we mean that she/he agrees from the beginning to meet us once or twice per month during the period April to October.

Selecting the agents implies that we invite them to participate by email or phone. This presupposes that we have a concise, self-explanatory paragraph ready, explaining to them (orally or written) what we want from them and what is their benefit of participating. If needed, we send them a written invitation with explanation of the logic and structure of the test. This has been done already once when we contacted SHs for the first time. We need to do it again explaining the specific nature of the test process and its importance for PERSEUS and the SH community. A lot of relevant material (e.g. factsheets) has already been produced within WP6; they can be used to draft the invitation letter and the info material (see Annexes to D6.12).

Step 3: Design the test!

The design of the test needs to take into consideration the number and specific attributes of the persons selected. Depending on the number of persons willing to participate, the test can take the form either of face-to-face or group meetings. A combined use of both approaches is possible. It is also possible to arrange 'hybrid' meetings where a mixture of SHs and scientists participate. The design can be done in collaboration with the agent - if we are lucky enough to have chosen a dedicated and interested agent. But it is expected that most of the work here will fall on the shoulder of the regional PERSEUS team in charge of the PC and on the scientists specialized on this issues.

General topics that need to be addressed by the facilitator and his team in each PC before the test begins are:

1) Think about possible issues at risk that could be the object of discussion with the agent in both versions: Coastal and open sea. It goes without saying that it is important to rely on the support of PERSEUS experts on the selected risks as they are presented in the Risk Factsheet issued during the Maltese EMD in May 2013. They must also be illustrative of the AMP strengths for the specific PC (i.e. availability of tools on combined pressures, regional models, databases, etc). We optimally would consider issues at risk characterized by:

> A socio-economic profile of pressures known from WP1 and 2

> A time horizon 2020-2030

> An explicit policy target modelled as a gap between BAU and MSFD-scenarios

> Ecological or socio-economic thresholds limiting the agent's potential for intervention.

> A spatial scale in conformity with the jurisdictional responsibilities of the agent(s).

> A set of program of measures to reach GES including monitoring, public awareness, need to pursue researches etc.

> 'Nodes' for policy adaptation and redefinition

2) Think about the pros and cons of alternative forms of meetings with the agent(s): how manageable and productive do the alternative meeting forms look like? Do we need to economize on time and effort by organizing group meetings? In what forms of meetings are we experienced? Deliberate with the agent(s) on this topic to see what is comfortable for them.

3) Think about methodological requirements of the chosen form of interaction with agent(s). There is to date an enormous number of techniques available to conduct SH deliberation and analytical approaches to extract insights. Is it a pure qualitative exercise where taking notes and logical analysis is all that is required? It is a study case involving agents, scientists and the facilitator? Is it a "focus group" meeting requiring special skills from the facilitator? Is it a "structured interview" type of meeting requiring the development of a specific questionnaire and the training of interviewer(s)? Is it a Fuzzy Cognitive Mapping exercise? What else?

4) Resolve practicalities: Have you produced / put together some illustrative material (e.g. the PERSEUS factsheet on AMP)? Are dates and venues of the meetings fixed in advance? Have you decided on who keeps notes of the test? Have you prepared for specific needs of specific methodologies (focus groups, fuzzy cognitive mapping, structured interviews etc)? Other?

Step 4: Implement the test!

In our (individual or group) meetings we intend to expose the AMP TB to the participants and get a feedback on its usefulness /appropriateness. The AMP TB itself should be in a form suitable to be demonstrated to the potential users, preferably as a web-based platform. We introduce the AMP TB to the agent(s) by saying that in 2015 the MS should implement an appropriate 'program of measures'. This raises questions such as: How to do it, how to choose among the available alternatives, how to evaluate policies? Do they perceive this need? Are they ready to handle it? Do they need support? What kind of support? Is the AMP TB a good support tool?

Starting from these investigative questions we inform the agent(s) of the specific tools available in the AMP TB: what the tools are about, provide a short description, ask about their experience with these or similar tools, etc. Depending on the familiarity of the agent(s) with similar web-based tools, the information phase on the AMP TB functionalities could take up our first meeting (or more!).

Irrespective of the chosen form of meetings, we optimally should discuss all aspects of the chosen issue at risk following the policy cycle:
•   Understanding the issues
•   Collecting information
•   Comparing options
•   Drafting scenarios
•   Visualize results
•   Revise results

The above topics are discussed sequentially in a number of meetings according to the approach/methodology chosen. We may devote our first meeting to the first topic of the above list ('understanding the issue') and investigate how AMP helps in dealing with it. We keep notes and write down any insights we gain during the meeting. If we

are lucky, the topic is exhausted in one meeting and we prepare ourselves to investigate a further topic in the next meeting with the agent(s).

The topics to be discussed are of unequal familiarity to the agent(s). 'Comparing options' and 'drafting scenarios' are expected to be a bit difficult to discuss - not the least because the availability and timeliness of the modelling cannot be guaranteed. The agent may ask for help in visualizing explicit, adaptive policy targets modelled as a gap between BAU and GES-scenarios but this is not at present easy. But do not loose faith: other topics will prove to be more easy and amenable to the agent(s) perception of policy making.

An important characteristic of AMP is policy adaptability. Therefore, the topic on 'Revise results' should be treated with care and discussed again and again. Most decision-makers do not know empirically what 'adaptive policies' look like and how such a state of policy-making can be achieved. It seems logical that in order to adapt, one has to anticipate: you adapt your targets and/or tools if you feel you are moving in the wrong direction. In our case, this can be guaranteed only with a suitable monitoring and observation system set up as an essential component of the policy (besides a strong sense of intuition and forward looking). It is impossible to test this point of AMP in real time; therefore we must simulate the need of the agent(s) to adapt. For example, in some point in the test we agree with the agent(s) to assume that our policies to address the chosen issue at risk miss the target. How does the agent(s) react? How can AMP help in this case?

It is very important to emphasize that what we are testing is the AMP TB, not the MSFD or the quality and effectiveness of the local marine policies. In order to highlight this and streamline the test, we have produced an evaluation questionnaire to be used during the interviews/meetings. The questionnaire could be sent out to a number of agent(s) to fill in, although this is not its primary intention. It should be used as a tool, firstly, to organize the discussion and, secondly, to facilitate and homogenize reporting of the main insights gained.

Step 5: Write down your results

Keep in mind that the follow-up of the test is to improve and adapt the AMP in line with the lessons learned from the tests, complete the knowledge database of PERSEUS, and draw conclusions on key successes and limiting factors. User experiences of similar Toolboxes are, however, seldom written down and formalized in order to make them easily accessible for other people. Therefore, well-formed reports on the practical test and evaluation of the AMP TB provides an important way of getting valuable and detailed information from the practical point of view.

The success criteria of AMP inter alia are: Easiness, flexibility, coverage, and conformity with existing practices. The filled-in questionnaires, your notes during the test, and the written texts that will be consequentially produced, are of vital importance in this respect. Furthermore, the results of the test in the four PC will feed

Deliverable D6.13. So take care to organize note taking (or even voice recording!) very seriously.