



Coordination and Support Action

Horizon 2020 - BG-13-2016

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***Working document for the prioritization
of the Bluemed SRIA goals for Implementation
based on inputs by countries***

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Introductory background

Following the agreement made by the Euro Mediterranean Group of Senior Officials BLUEMED Working Group in Barcelona on October 2018, the BLUEMED SRIA has been updated with the input from non-EU countries and represents now a comprehensive strategy with the views of all stakeholders in the Mediterranean Basin. The document of reference, version 2018, is available at:

www.bluemed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf.

It is now time to **implement a plan**, based on **actions**, to reach **objectives** that will contribute to address the **challenges** identified in the BLUEMED SRIA. A first step towards the implementation of the SRIA is to reach a consensus on which are the most pressing goals to achieve and what are the necessary actions to be implemented in order to reach those goals.

BLUEMED CSA elaborates a **methodology** for countries to select priorities of the SRIA, in order to develop an Implementation Plan based on those priorities.

The difficulty was to design a **method rigid** enough to allow comparable results, and **flexible** enough to allow countries give their **national perspective** (priorities can change on social, geographical, economic reasons, etc.).

Before crossing results at international level, it was important to give freedom to the countries to select their priorities according to the process they consider to be the best given their national mechanisms (stakeholders' consultation, inter-ministerial agreement, national pivots agreement – or a mix of all them).

Methodology

At national level:

- **Step 1** → all countries scored all SRIA goals from 1 to 10 based on 4 criteria (scientific, economic, techno and policy impact at Med level) and they classified goals between short/long term.
- **Step 2** → all countries generated a top10 list of priority goals based on step 1 and following 10 criteria proposed by Italy (CNR):
 - a. Goal clearly in the field of research & innovation;
 - b. Goal addresses an issue which is relevant for the Mediterranean Sea;
 - c. A realistic action plan can be established for the next years (favour g/a that could be developed in the short term);
 - d. Possibility to have a leverage effect (convergence of the BLUEMED priorities with other strategies, e.g. Regions);

- e. Expected impact in terms of economic development, jobs, well-being of citizens, etc.;
 - f. Gaps and risks;
 - g. Required conditions (infrastructures, human resources, possibility of funding, etc.);
 - h. The 'across-pillar' added value;
 - i. Goal clearly filling a gap;
 - j. Goal not overlapping with existing initiatives/projects.
- A motivation for the selection of goals and main actions needed in their opinion to achieve those goals have also been requested.

All processes at national level were welcome for steps 1 and 2.

- 14 countries have given feedback on steps 1 and 2 (Croatia, Cyprus, Egypt, France, Italy, Spain, Greece, Malta, Jordan, Morocco, Portugal, Slovenia, Tunisia and Turkey);
- AEI (ES) has crossed results during the last weeks;

Very positive first conclusions:

- Many countries have a high degree of coincidence;
- Some countries like France or Italy have done an interesting interpretation of the exercise (aligning with relevant initiatives, e.g. WestMED or clustering priorities);
- Non-EU countries have given very good feedback.

At international level:

- **Step 3** → national exercises and a comprehensive matrix of results have been distributed to CSA coordinator, Work Package leaders and Platforms Coordinators, as background documents for the meeting scheduled in Rome on 21 March 2019 (see the Annexes);
- Results and different approaches have been discussed to draft the present working document. The priorities proposed, grouped in 'thematic' and 'cross-cutting' priorities, are the most chosen ones by countries and are indicated as 'primary' in the tables below. A 'secondary' bunch of priorities, whose rating is just below the threshold, emerging as relevant from the technical discussion, has also been added. Following the clustering approach, other relevant goals highly related to the selected ones are also highlighted. A strong emphasis on the across-pillar value has been also given by associating together actions belonging to different sectors.
- How to read the tables: with reference to the SRIA, each goal is identified with a letter indicating the Pillar of reference (K =

Knowledge, E = Economy, T = Technology, CC = Cross-cutting) and its specific letter and number. The same code applies to the actions. For example, the action K-A1.1 is the action #1 of the goal A1 belonging to the Knowledge Pillar. The number of countries selecting the goal as priority is also reported.

- **Step 4** → Final conclusions of the 21st March meeting will be communicated to the GSO BLUEMED WG for their analysis, agreement and validation of priorities during the meeting scheduled for 4th April.
- With the GSO's endorsement, AEI and task partners will further develop the draft Implementation Plan focusing on the selected priorities + the pilot "Towards a healthy plastic-free Mediterranean Sea".

BLUEMED SRIA THEMATIC PRIORITIES (PRIMARY)				
Selected goal	Other related goals	Most relevant actions identified to reach the selected goal	N of countries addressing this goal	Argumentation
K-D2. Support solutions for sustainable food production	<p>E-B1. Develop optimal fishing strategies, technologies and practices</p> <p>E-B2. Develop optimal aquaculture strategies, technologies and practices</p>	<p>K-D2.1 Identify marine biota as a new source of protein for human consumption.</p> <p>K-D2.4 Develop Mediterranean aquaculture: new management tools, ecosystem-based approach, tackling pathogens; develop conceptual models for Integrated Multi Trophic aquaculture (IMTA).</p> <p>E-B2.6 Study and evaluate the best processes to adapt and diversify aquaculture activities (species and systems) and capacities in a changing environment, including for small and medium-scale farms.</p> <p>E-B1.2 Develop best methods to integrate the use of by-products and by-catch from fisheries and aquaculture in the production chain</p>	10	<p>This goal together with the related ones fully supports the economic driver “Food” being at the same time one of the shared Mediterranean cultural root. It also promotes some improvements in the fisheries and aquaculture sectors with the aim to make these economic activities more environmentally and economically sustainable. Overfishing represents a threat for marine ecosystem biodiversity, and present food provision levels cannot be considered sustainable. Pragmatic actions are thus needed to preserve marine living resources while guaranteeing employment opportunities and even fostering new jobs creation. This can be achieved by developing innovative aquaculture strategies, technologies and practices, and by supporting and managing the transition from industrial overexploitation of marine resources to the adoption of sustainable fishing strategies. Securing high quality and safe food supplies is an obvious key goal for all nations, particularly taking into account the way climate-induced extreme weather events, pollution and other</p>

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		E-B1.3 Develop innovative methods and tools for monitoring and governing Mediterranean aquaculture and fisheries, in line with existing policies.		natural and anthropogenic phenomena, are already affecting food production in the Mediterranean region. It is crucial to invest in research and innovation in order to safely exploit marine resources for long-term, resilient and secure food production. It is a priority to work at Mediterranean level because fish stocks and aquaculture species/practices are mostly specific of the Med. In alignment with the GFCM and EATiP agendas, the goal supports the implementation of the CFP, the Food Strategy 2030, and relevant UN-SDG.
K-A2. Understanding Pollution Impacts, Mitigation, and Remediation in the Mediterranean Sea	K-A1. Understanding the functioning of the Mediterranean Sea ecosystem	K-A2.1 Develop coastal and marine potential hazard/pollution sources maps (exploiting Earth Observations and linking to pollutant dispersion models) to identify hot spots and areas that are particularly exposed to the impact of multiple stressors and propose possible solutions. K-A2.5 Define distribution, concentration and provenance (when possible) of all forms	10	Detect and understand pollution impact is the basic for the set-up of a strong research plan to support the proper management and improvement of the marine environment and connected activities. Either from land or marine activities, the priority actually addresses an acute issue in the Med, where coastal population is constantly growing: unless adequately studied and innovatively tackled, the ecological and social impacts of marine pollution will affect economic development adversely across the Basin. Understanding the effect of pollution and

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		<p>of garbage at sea (including plastic and microplastic debris) at the sea surface, within the water column, the sea floor and the coastal-estuarine environments; rise awareness through literacy and citizen-science initiatives.</p> <p>K-A2.6 Explore and propose solutions to reduce the input of pollutants from atmosphere, land and sea:</p> <ul style="list-style-type: none"> - Obtain marine eco-toxicological data for contaminants in marine waters and sediments, at different levels of biological organization. Develop environmental criteria (baseline and thresholds) for alert/intervention and early warning tools (e.g. using novel biomarkers) - Develop and test (bio)remediation measures in diverse areas, considering re-use and recycling of 		<p>the way to combat the various forms it takes (including plastics, emerging chemical pollutants and noise) remains a challenge. Deploying available knowledge to fill gaps in understanding how the Mediterranean Sea peculiar ecosystems function to better know the fate of pollutants can rapidly enable to take tailored measurements to protect it, develop new technologies and enhance the economy of the region. This calls for focused research initiatives as highlighted by actions A2.1, A2.5 and A2.6 while linking with monitoring/mitigation technology actions. This should also bring concrete impact in terms of economic development, jobs, well-being of citizens, being clearly related to maritime activities (tourism, seafood quality...).</p> <p>While responding to the growing attention devoted to macro and microplastics, and supporting the BLUEMED Pilot on plastic-free, healthy Mediterranean Sea, the priority can add value in relation to policy frameworks developed at the EU level (e.g. the MSFD, the EU Plastic Strategy) and international level</p>

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		<p>hazardous materials to promote sustainable redevelopment of aquatic contaminated sites</p> <ul style="list-style-type: none"> - Develop new generation techniques for identification of molecules; in situ sensors (and biosensors) for a large-scale view of their distribution; mechanisms of transfer and bio-magnification and modelling of the food web - Identify sources of chemical pollution from sunken ship wrecks and containers thrown at sea, inventory of critical hazards and risk assessment of leak impacts in space and time; identify possible genetic pollution from aquaculture animals to natural populations and effects to the ecosystem - Improve wastewater treatment processes and recycling to prevent 		(UNEP/MAP, the UN-Decade for Ocean Science and the G7&G20 Groups).

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		<p>the impact of pollution in coastal areas.</p> <p>K-A2.4 Measure and identify emerging chemical compounds (e.g. pharmaceuticals, synthetic drugs) from terrestrial sources, determining contaminant dispersal in all marine matrices; characterize sources, pathways and effects on marine ecosystems; develop early warning tools.</p> <p>K-A1.4 Fill gaps in understanding the Mediterranean Sea dynamics, biogeographic patterns, biodiversity (including cryptic and microbial), and ecosystem functions (including fishing resources) using novel monitoring, e.g. satellite, marine drones, molecular/genetic tools to develop new end-to-end models forecasting the carrying capacity of the Mediterranean ecosystems.</p>		

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<p>K-B2. Preparing to climate change and define adaptation/mitigation measures</p>	<p>K-C1. Reducing the coastal risk of disasters and their effects</p> <p>T-B1. Towards an observing system of systems</p>	<p>K-B2.1 Make a comprehensive assessment of climate and anthropogenic related risks and opportunities in the Mediterranean Sea ecosystem and human environment from the coastal zone to the deep ocean, including extreme climate events, acidification, sea level rise, flooding and invasive species.</p> <p>K-B2.2 Develop, enhance and deliver user-friendly tools for disseminating climate information related to Mediterranean atmosphere, coastal and deep ocean areas.</p> <p>K-B2.3 Climate Change and Blue Growth: Develop climate adaptation and mitigation strategies.</p> <p>K-B2.4 Identify how activities, such as water use, can accelerate and enhance impacts of climate change through increased coastal subsidence, salt wedge penetration and</p>	<p>11</p>	<p>The Mediterranean has been characterised as a climate change vulnerability “hotspot” by the IPCC. Most countries are already experiencing, high temperatures and increased humidity or drought coupled with increasing water scarcity, forest fires and the possibility of desertification. Climatic changes are expecting to have major impacts on the ecosystems and the provision of ecosystem services but also on human safety as well as global and national economies. For example, vulnerability of ecosystems as well as agricultural systems would critically raise by increased water-scarcity, and this would also impact food production. On the other hand, the ocean is by far the largest water reservoir on the Earth but the marine water is salty. Action B2.5 fosters research to introduce, design and optimize systems and devices to desalinate marine waters, thus helping in relaxing fresh water deficiencies. In addition, numerical models predicting the water vapour transport from the ocean on land could be considered as part of research activities in the framework of BG. Furthermore, the Mediterranean accepts approximately one third of the global</p>

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		<p>ultimately increased flooding risks and desertification.</p> <p>K-B2.5 Launch a pan-Mediterranean program on coastal fresh water reserves: quantification of reservoirs, state of the water (quality, contaminants, depth beneath surface), level of exploitation and frames for sustainable use of this good. Promote innovative desalinization practices in areas with lack of fresh water minimizing negative impacts on shallow marine ecosystems.</p> <p>K-C1.4 Fill gaps in understanding coastal morphodynamics at regional and local level including a focus on coastal erosion and on anthropogenically induced erosion processes (e.g. erosion due to maritime transport in near-shore areas next to ports, especially those close to natural protected</p>		<p>international tourists, and the number is expected to increase in the forthcoming years, but climate change is expected to have an effect in tourists needs and expectations which may result in the diminishing competitiveness of certain destinations, affecting local, regional and national economies. There are still gaps in research and innovation with regard to understanding climate phenomena, hence developing the appropriate mitigation and adaptation strategies. However, it is evident that the economic and social cost of inaction will clearly be far higher than the cost of action. Climate change adaptation is a major crosscutting issue. It requires increased knowledge, technological and social innovation and policy shifts and the Mediterranean as a region needs to tackle this in a unified way, as there are important adaptation gaps, behavioural and economic barriers that hinder the effectiveness of measures. The ability to cope and adapt also differs across populations, economic sectors and regions within Europe, and the most vulnerable are the ones facing the most difficulty in adopting the necessary</p>

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		<p>areas; rockfall of coastal cliffs...).</p> <p>T-B1.2 Support long term and long-time series observing systems for climate change impact evaluation.</p>		<p>measures. The pledges made in the framework of the Paris Agreement need to be upheld. At a national level, stakeholders need to urgently develop and implement strategies to conserve and safeguard marine ecosystems, without which there can be no blue growth in the long term. Actions can be taken in accordance with the strategic objectives and priorities identified during the 19th meeting of the contracting parties to the Barcelona Convention regarding Regional Climate Change Adaptation measures as well as other regional frameworks such as the EU strategy on Adaptation to Climate Change which was adopted in 2013, the Arab Framework Action plan on Climate Change (elaborated by LAS) and the proposals of the UfM Climate Change expert group. The MedECC network of Mediterranean Experts on Climate and environmental Change could also be of reference.</p>
E-C1. Linking tourism,	K-B2. Preparing to climate change and	E- C1.1 Promote synergies between tourism and other productive activities (e.g. fishing tourism, marine mammals watching,	8	Tourism is a key sector in most of the Mediterranean coastal regions. The Mediterranean can take advantage of its valuable natural and cultural assets. Its heritage

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tourists and environment	<p>define adaptation/mitigation measures</p> <p>K-C1. Reducing the coastal risk of disasters and their effects</p> <p>T-D1. Technology solutions for the Mediterranean natural and cultural heritage</p> <p>CC-A4. Building capacity, blue skills and blue professionals</p>	<p>aquaculture and tourism), encouraging networking with other economic sectors (agriculture, crafts, culture, fishing, etc.) and between destinations in order to enlarge the tourism offer.</p> <p>E-C1.7 Develop monitoring and evaluation systems of tourism flows (economic, social and environmental), assessing carrying capacities of destinations, to support an efficient management of tourism flows and impacts leading to an effective governance of tourism growth/E- C1.8 Implement evaluation measures and methods to address the development of a greener and sustainable tourism industry/E-C1.9 Develop methodology, tools and system for assessing environmental impacts of tourism and its drivers in the Mediterranean area.</p>		<p>reflects a millenary history. The climate of the area is favourable to the exercise of tourist activities throughout the year. Touristic economy is therefore of high importance for many countries. By providing incomes and jobs to the local population, this sector is also considered as strategic by many coastal regions. However, tourism often exert high pressures on the coastal and marine environment, especially during seasons of affluence when the population of some areas increase dramatically. Thus, decreasing the impact to the environment through developing sustainable and low-footprint solutions will allow for preserving the natural and cultural heritage on the long term. This priority supports the implementation of the “European Strategy for more Growth and Jobs in Coastal and Maritime Tourism”. The transition towards a more sustainable tourism will need innovative approach and the support of socio-economic research. Connecting coastal tourism with other branches of maritime economy (e.g. pescaturism) or with the inland can be of great potential. Very interesting prospects are also offered in this sector by the</p>

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		<p>K-C1.6 Study coastal urbanization trends and related pressures to improve protection of coastline ecosystems.</p> <p>T-D1.3 Technologies and innovations to strengthen sustainable development policies, more efficient use of natural resources and cultural heritage in coastal and marine areas such as:</p> <ul style="list-style-type: none"> - 3D virtual diving with applications for smartphones, for the promotion of natural and cultural heritage; - Ecological engineering: artificial reefs for diving sites, underwater trails, preservation of biodiversity; - Eco-yachting: ecological moorings. <p>T-D1.5 Blue marinas with nature-based solutions. Design and develop innovative integrated solutions using clean technologies to improve the sustainability and management of infrastructures/T-D1.6</p>		fast development of ICT. This makes possible to experiment innovation in a very short term.

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		<p>Develop a strategy focusing on new ICT technologies and services for sustainable tourism (integrating coast and inland waterways) to de-seasonalise and differentiate tourism products.</p> <p>CC- A4.10 Train a new generation of marine technicians/scientists to conduct research on the protection of the marine cultural heritage.</p>		
E-E2. Effective maritime spatial planning in the Mediterranean	<p>T-B3. Security and safety services and technologies in the Mediterranean supporting the Blue Growth</p> <p>K-C1. Reducing</p>	E-E2.1 Improve the knowledge on the land-sea nexus to properly address planning, considering co-existence of coast and sea uses and environmental objectives; particular emphasis should be placed on substantially improving the connection between marine traffic with port location/activities and the main supply chains on land (train and free-way networks as well as water ways where appropriate).	7	MSP is about promoting the rational use of the sea and improving decision-making. It is well recognized how “Governance of the maritime space” is at the base of any socio-economic development and conservation effort. Implying a paradigmatic change in the management of the commons, it requires multidisciplinary R&I, both in terms of conceptual approaches and analysis and in terms of dedicated technologies to support the governance on the field, including surveillance. Indeed, the Mediterranean Sea presents specific governance needs, due to its

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	the coastal risk of disasters and their effects"	<p>E-E2.3 Define and study approaches and tools to identify the trade-offs between ecological dynamics and socio-economic needs, taking into account marine ecosystems goods and services and their environmental, economic and social value, in order to inform and improve adaptive planning and management scenarios.</p> <p>E-E2.5 Address transboundary maritime spatial planning issues to understand problems and opportunities (social, economic, environmental) and strengthen knowledge on environmental pressures across borders.</p> <p>E-E2.6 Develop tools/software to assess the cumulative impacts of human activities, including the role of land-based stressors, to ensure an eco-sustainable exploitation of</p>		<p>morphology and its geopolitical situation. It is in the interest of all Mediterranean countries to seek to balance sectoral interests and use space more efficiently, thereby contributing to the long-term sustainable use of marine resources. The increase in maritime activities and the development of new initiatives in the Mediterranean naturally lead to competition between maritime activities or between such activities and the environment. This is particularly true for coastal areas and ports where a variety of maritime activities take place, such as fishing, mariculture, maritime transport, dredging/sand extraction and marine and coastal tourism, but it also applies to offshore environments and activities.</p> <p>The topic is fully transversal, affecting all blue economy sectors and environmental objectives. By clearly defining areas for specific purposes, especially human activity, investors in specific areas can be more easily attracted, ultimately improving citizens' well-being. A number of actions is already ongoing at national and sea basin scale (e.g. MSFD implementation, update of Barcelona Convention Regional Frameworks,</p>

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		<p>marine resources, considering social and economic aspects.</p> <p>E-E2.8 Implement managing solutions and conservation plans, including networks of Marine Protected Areas and their surroundings, for coastal to deep-sea ecosystems, taking into account their relationship with natural and anthropogenic changes (such as artificial reefs) in the environment while ensuring and promoting ecosystems services; best practices on adaptation and resilience.</p> <p>T-B3.1 Integrate the Information Communication Technologies-ICT (Big Data, IOT-connected objects, Deep Learning, etc.) in the development of observing systems to deliver high-tech products and services for traditional and emerging sectors such as fisheries, aquaculture, MRE, etc.</p>		<p>Integrated coastal management projects, discussions and agreements on disputed areas) requiring scientific and knowledge support: they can provide concrete results in short time. Beside the direct implementation of the MSP Directive, the potential policy impact of this goal is clearly very high and is linked with all existing strategies at regional and sub-regional scale. Regional and international cooperation – including on legal and political issues – and stakeholder engagement are crucial for MSP to be effective. A long-term plan is needed.</p>

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		K-C1.7 Identify the risks introduced by anthropogenic features such as ports, oil terminals, offshore platforms, aquaculture plants and map the relevant information defining and assessing possible mitigation scenarios.		
T-A1. Greening vessels, facilities and services	T-A3. Connected and automatic transport; K-A2. Understanding Pollution Impacts, Mitigation, and Remediation in the	T-A1.1 Implement multidisciplinary integrated methodologies to evaluate the impact of ships and harbours on the environment at transnational level, in the light of the specific characteristics of the Mediterranean basin. T-A1.2 Develop new vessel concepts, i.e. flexible, modular and high efficient ships, using new materials (e.g. high strength, lightweight, smart, ...) and advanced design and production techniques, with lower manufacturing, construction, installation,	6	Shipping and ports are significant economic drivers in the Mediterranean Sea, which represents 30% of global sea-borne trade by volume, is the world's second largest market for cruise ships and hosts over 450 ports and terminals. It is therefore a necessity to develop green activities and innovative solutions to reduce the environmental footprint of commercial, tourist maritime transports and port infrastructures. The development of new concepts and efficient ships, using new materials, advanced design, production techniques, with lower manufacturing, construction, installation, dismantling and recycling costs, in the

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	Mediterranean Sea	<p>dismantling and recycling costs from the perspective of the circular economy.</p> <p>T-A1.3 Low emission alternative fuels: support the design of LNG-fuelled ships and appropriate inland, coastal and offshore infrastructures, and the research on biofuels and hydrogen.</p> <p>T-A1.4 Exploit new technologies and tools to monitor pollution from ships on route coast and in harbours.</p> <p>T-A1.5 Towards shipping electrification: support research on cold ironing from renewable resources, batteries and fuel cells and internal combustion engines in particular for fishing boats.</p>		<p>perspective of circular economy, would be a strong source of employment and would generate new skills for professionals. These actions are required to reduce the pollution emitted at sea (i.e. towards lower emissions and noise reduction) and at ports (i.e. towards ship electrification and sustainable new infrastructures). Innovative smart and clean technologies will also considerably improve the health and wellbeing of coastal/port areas inhabitants and professionals using vessels and port facilities.</p> <p>A realistic plan of action can be established for the next few years on green and smart ship, smart grid harbour, low emission in CO₂, NO_x, SO_x, etc., LNG then hydrogen energy propulsion. Those actions are important to combat climate change due to increasing GES. Synergies can be established between this cluster of goals and ongoing international strategies and stakeholders' associations (e.g. SeaEurope). For example, a proposal supported by several countries to establish a potential Emission Control Area (ECA) in the Mediterranean Sea is being under study by the</p>

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		<p>T-A1.6 Design and develop innovative green infrastructure solutions and tailored software to improve the sustainability of logistics and ports, with special reference to energy efficiency and externalities related to the surrounding built environment.</p> <p>T-A1.7 Develop innovative design and management solutions for eco-friendly vessels, e.g. antifouling, greener propulsion for transport, leisure and fishing boats, fuel saving and noise reduction materials for vessel-water interface.</p> <p>T-A1.8 Zero emission fuels: support the design and implementation of module-based hydrogen fuel cells and internal combustion engines for propulsion and power generation of ferries and other types of ships and vessels and appropriate infrastructures for producing the hydrogen</p>		<p>IMO. The implementation of such an area would address both sulphur and nitrogen oxides, and would have the greatest positive effect in reducing air pollution and bringing socio-economic and ecological benefits. Moreover, increasing connectivity among ports and developing efficient Motorways of the Sea can be great assets to strengthen links between Mediterranean ports' communities and to increase economic operations.</p>

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		<p>from wind renewable energy doing a paradigm shift towards entirely emissions-free maritime transport.</p> <p>T-A3.2 Towards efficient Motorways of the Sea (MoS) and their connections among Ports: develop feasibility studies, identifying main obstacles, and innovative methodologies/tools for the efficient functioning of the existing MoS and the establishment of new ones.</p> <p>K-A2.3 Conduct in situ measurements and develop modelling (including Big-Data modelling) tools to understand the distribution, intensity and sources of underwater noise, as well as its effect on marine species.</p>		
T-B1. Towards an observing	CC-A1. Open data, open	T-B1.1 Develop technologies towards an integrated Mediterranean observing system, capitalizing on existing networks and	9	Blue Growth demands for a holistic approach, integrating of knowledge on ecosystem functioning, economy and societal needs and

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system of systems	<p>science, open innovation</p> <p>CC-A3. Interaction between scientists, stakeholders, policy and decision makers, civil society</p>	<p>consortia, including European Strategy Forum on Research Infrastructures, and national/regional/local infrastructures, in line with the overall European contribution to global observing systems, such as in the Common Information Sharing Environment (CISE) approach.</p> <p>T-B1.2 Support long term and long-time series observing systems for climate change impact evaluation.</p> <p>T-B1.3 Implement ICT, Big Data Analysis and Cloud Services Platforms to take advantage of multi-sectoral data management and sharing opportunities for the Mediterranean.</p> <p>T-B1.5 Develop appropriate systems to foster Citizen Science initiatives and</p>		<p>dynamics. Among the pre-requisites for this approach is the open access to multi-disciplinary data, which requires proper support for the augmentation and evolution of ocean observing systems. However, a number of variables that are known to be important for monitoring of environmental conditions are still not properly observed, as the technology is not developed properly. Also, a longevity of observations with prescribed methodology is present just in some parts of the Mediterranean, whilst being necessary for proper assessment of climate changes to the marine environment. Therefore, there is a clear need for more comprehensive and accessible data sets, in order to analyse and monitor risks in the Mediterranean Sea using advanced data-capturing techniques and unlock Med-specific knowledge and innovation potential. In situ and remote observations of the sea are an essential ingredient for monitoring, security, safety and surveillance, but also to provide essential data for value addition and provision of novel services. This data can be used for early detection, mitigation and monitoring of both</p>

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		protocols to complement environmental and ecosystem monitoring.		<p>natural and human disasters as well as to provide other relevant services.</p> <p>The important lack of permanent standardized observatories does not allow facing properly most of the BlueMed challenges. Coordinating the observing system of systems, being a research and innovation enabler by definition, is relevant for the Mediterranean Sea and requires actions, conditions and opportunities involving EU and non-EU countries (with a stronger focus dedicated to identified sectors and key areas such as: coastal zones, fisheries, aquaculture, port areas, pollution including marine litter). Priority short term actions can be identified based on existing knowledge and capitalizing on consortia and projects' achievements.</p>

BLUEMED SRIA THEMATIC PRIORITIES (SECONDARY)				
Selected goal	Other related goals	Most relevant actions identified to reach the selected goal	N of countries addressing this goal	Argumentation
K-D1. Exploring the potential of blue-biotech	E-A2. Generating new products and services	TBD	5 & technical discussion at CSA level	<p>The goal supports filling the “Blue Biotech” knowledge gap. If the marine environment has often been considered as a new frontier for Man, exploring the Mediterranean marine biodiversity is unique diverse because the Mediterranean is a hot spot for biodiversity. This because on one hand the accumulated knowledge on its internal dynamics and the hosted, exploitable resources is still poor, and on the other hand because there is a general consensus that marine biota might host metabolites and mechanisms, very different from those of terrestrial organisms, which might have high potential for application in nutraceuticals, biomedicine, materials and even in engineering. Actually, this goal is at the crossroads of biotechnology, food production, and bio resources with socio-economic impacts: health, nutraceuticals, cosmetics are areas of strong growth and well-being for citizens.</p> <p>While being the economical ‘weight’ of blue biotech very small today (emerging topic with low TRL), it may have a great potential on the long term. Convergences are clear with European biotech infrastructures (EMBRC for example).</p>
E-E3. Promote the role of Marine Renewable Energies	T-C2. Increase the fraction of installed	E-E3.3 Develop large demonstration projects to sustain commercial MREs development, including Floating Offshore Wind	3+2 & technical discussion at CSA level	<p>The design of innovative concepts of MRE devices, particularly floating offshore wind technology that can be deployed in Mediterranean deeper waters, has made MRE a breakthrough innovation market. As reported in the implementation plan of the Strategic Energy Technology Plan (Set Plan), the challenge for 2025-2030 is to make MRE increasingly competitive with respect to other</p>

<p>(MRE) in the energy transition phase</p>	<p>marine renewable energy power plants</p>	<p>Turbine which is particularly relevant in the Mediterranean.</p> <p>T-C2.3 Develop technology design tools for MRE: impact of biofouling on components, behaviour of structures/components in fatigue, innovative monitoring strategies, anchoring.</p> <p>T-C2.4 Tool development farm architecture and integration with electric networks, energy storage (Hydrogen, ...).</p> <p>T- C2.7 Study and improve the acceptability of MRE projects through an enhanced knowledge of their environmental interactions and a thorough multidisciplinary evaluation including socio-economic dimension.</p>		<p>consolidated forms of renewable energy. This sector is relatively mature from a technical point of view and some test facilities both at sea and inland are available. Further research is needed to reach the adequate technological level in terms of system integration and LEC (Levelised Energy Cost) to further exploit the potential of sea and wind not only to produce energy to be fed into the main grid. Other uses of offshore energy production are the decentralized production of fuels to be used for fuel cells and in electrolytic processes (methanol, hydrogen ...), the desalination processes of seawater and for aquaculture activities. Therefore, MRE will have a direct and important impact on other key blue growth sectors such as shipping, maritime surveillance, fishing and aquaculture and tourism. MRE are expected to have a great impact in terms of economic development, jobs and well-being of citizens.</p>
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BLUEMED SRIA CROSS-CUTTING PRIORITIES (PRIMARY)				
Selected goal	Other related goals	Most relevant actions identified to reach the selected goal	N of countries addressing this goal	Argumentation
CC-A1. Open data, open science, open innovation		<p>CC-A1.1 – Promote and regulate transparency with regard to the results of research conducted or ‘owned’ by public/private companies and institutions, and public authorities, and take action to make them more readily available to the society.</p> <p>CC-A1.2 Create a “Blue Cloud” for Marine data accumulation (e.g. oceanographic, bioptical, genomics, -omics, and -metaomics) at Mediterranean level/CC-A1.4 Promote standardization and interoperability of technological solutions with specific reference to the maritime field with innovate “guides to the use” explaining what diverse sets of data are available, standardized sampling and analyses methodologies. Linking all “guides” to</p>	7	<p>The Mediterranean Sea, a closed basin with unique characteristics, is a common good of the riparian countries. Sharing knowledge about the health, evolution and functioning of its marine and coastal ecosystems is a challenge. Progress in this direction is necessary to ensure the preservation of its resources, develop sustainable activities, control pressures and anticipate the responses to global change.</p> <p>Especially in the Mediterranean, Blue Growth therefore demands for a holistic approach, integrating of knowledge on ecosystem functioning, economy and societal needs and dynamics. However, collecting marine, environmental of socio-economic data is expensive and data a valuable asset. Rapid access to reliable and accurate information is vital in addressing threats to the marine environment, in the development of policies and legislation to protect vulnerable areas of our coasts and oceans, in understanding trends and in forecasting future changes. Sharing data and knowledge is a key element in establishing a common understanding of the issues related to the marine environment and strengthening the science-policy interface.</p>

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		<p>their corresponding Blue Cloud database.</p> <p>T-B1.3 Implement ICT, Big Data Analysis and Cloud Services Platforms to take advantage of multi-sectoral data management and sharing opportunities for the Mediterranean.</p> <p>T-B3.1 Integrate the Information Communication Technologies-ICT (Big Data, IOT-connected objects, Deep Learning, etc.) in the development of observing systems to deliver high-tech products and services for traditional and emerging sectors such as fisheries, aquaculture, MRE, etc.</p>		<p>Data, if of high quality, can be valued in several ways. To get the most out of them, they must be accessible to researchers, public policy makers and the private sector, which will be able to base services on these data. Sharing data is also a booster for innovation. Fundamental to growth and development is a fair playing field: the best rise to the top to make new, innovative services for society from the open interoperable resources available. The sharing of data and best practices allows technology to progress more quickly and efficiently, while easily moving across boundaries of country, market sector, culture, race, etc. This strategy is promoted at the European level (Inspire, European Open Science Cloud, EMODnet, Eurostat...). Taking measures for implementing these open approaches in the Mediterranean could be of great benefit for all Mediterranean countries.</p>
CC-A4. Building capacity,	CC-A2. International Cooperation	CC-A4.1 Develop a network of training research centres to train new professionals on sampling, recording	7	One crucial ingredient to unlock the Med Sea potential is clearly the human element. Human capital constitutes an overarching condition to achieving the region's

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blue skills and blue professionals	and Coordinated Transboundary Networks	and working at marine level for environmental, engineering and scientific studies/CC-A4.2 Align high education curricula, establish joint MSc, PhD programs, short term scientific exchanges, to prepare the next generation of blue-economy scientists, technologist and entrepreneurs/CC-A4.4 Co-develop training courses and knowledge exchange activities to improve the level of institutional, technical and human capacities at national level for the implementation of Maritime Spatial Planning and Maritime Governance/CC-A4.9 Promote capacity building to increase resilience to disasters of Mediterranean countries/CC-A.10 Train a new generation of marine technicians/scientists to conduct		<p>economic, knowledge and technology priorities, not least in terms of research and innovation.</p> <p>Many blue economy sectors still find it hard to attract the right employees, mainly due to the skills gap that persists between the education offer and the needs of the labour market, but also as a result of poor cooperation between academia and industry, the relatively low attractiveness of blue careers and a general lack of ocean literacy. With the right deployment of measures – e.g. practice-oriented and flexible training, apprenticeships, e-mentoring, innovation hubs and networks, social enterprises, incentives for SMEs and start-ups – however, considerable improvements can be expected in the short term, matching the European Commission’s target of two million new jobs in the sector by 2020.</p> <p>This Goal supports the “New Skills Agenda for Europe” and the European Commission’s mission to focus its efforts on Blue Careers, Blue Labs and grants for the blue economy. It also reflects the “European Strategy for more Growth and Jobs in Coastal and Maritime Tourism”, the Westmed Initiative priorities and a good number of local and regional initiatives.</p>

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		<p>research on the protection of the marine cultural heritage.</p> <p>CC-A4.3 Develop an electronic platform for e-mentoring of young start-uppers in blue growth acting like a virtual incubator to create a lively ecosystem of entrepreneurs of innovation.</p> <p>CC-A2.3 Establish a coordinated network of marine institutes, universities, stations, observatories and public and private companies.</p> <p>CC-A2.5 Improve coordination and cooperation among Member States and non-EU countries to achieve the Good Environmental Status by developing standard methodologies to implement the Marine Strategy Framework</p>		<p>Transboundary cooperation is a prerequisite for developing blue R&I capacity in the Mediterranean region and supporting it with the right skills sets. This Goal could lead to the design and establishment of a “BLUEMED Academy” to further develop “an educational critical mass and regional pool of resources”, as clearly addressed by the European Marine Board in the recommendations of the Policy Brief “Training the 21st Century Marine Professionals”. This needs to be customized to Mediterranean peculiarities and potential and be closely linked to local communities and their socio-economic needs. It can produce positive effects in a relative short time, in particular within already established blue economy sectors, with direct impact in terms of economic development, jobs and the well-being of citizens.</p> <p>Fully in line with the UfM BlueSkills activity, supported in high-level fora such as the “Dialogue 5+5”, the Goal can build and capitalize on the already established network of infrastructures, universities and research institutions. It can also be driven by an economy sector, connecting Goals and Actions across the different pillars. Networking opportunities involving EU and non-EU countries are offered by existing networks and hubs at</p>

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		<p>Directive and the UNEP-MAP Ecosystem Approach in shared waters.</p> <p>CC-A2.8 Develop new concepts and protocols with private companies and maritime operators to maximize the use of infrastructure, ships and platforms for scientific and environmental monitoring, safety and security purposes.</p>		<p>national and international level such as by UNIMED, EMUNI, the research infrastructures EMBRC and ASSEMBLE and the IOC-UNESCO Ocean Teacher Global Academy.</p>

BLUEMED SRIA CROSS-CUTTING PRIORITIES (SECONDARY)				
Selected goal	Other related goals	Most relevant actions identified to reach the selected goal	N of countries addressing this goal	Argumentation
E-E1. Strengthen synergies among science, industry, policy-makers and society	CC-A3. Interaction between scientists, stakeholders, policy and decision makers, civil society	<p>E-E1.1 Develop participatory approaches to take decisions by improving the dialogue with civil society, considering its importance (e.g. awareness, inputs, transparency, participation, consensus and support) and its specific technicalities (e.g. engagement at local level, language, ambassadors).</p> <p>E-E1.4 Provide scenarios of environmental change, investigating the impacts on biodiversity and ecosystems goods and services, of alternative socioeconomic development pathways, policy options and blue growth scenarios.</p> <p>CC-A3.1 Enhance awareness at both civil and political levels that the degradation of the marine environment presents crucial security challenges in terms of disruption of national economies,</p>	6	Encouraging networking among different sectors to strengthen synergies, this goal is strongly characterized by the ‘across-pillar’ added value as necessary (default?) background methodology of all science-to-policy processes, in particular when considering the geo-political complexity of the Mediterranean. Indeed, there is a great need to promote communication and dialogue between different stakeholders in the Mediterranean region in order to achieve the objectives of the SRIA. Developing participatory approaches to take decisions, including civil society, is crucial for social proper governance. From one side science should know more about challenges other sectors of society are facing, from the other existing research findings should be more incorporated in other sectors of society thus impacting in terms of economic development, jobs, well-being of citizens. This goal, for which a realistic action plan can be established for the next years, also opens up the possibility to have a leverage effect (e.g. convergence of the

BLUEMED SRIA CROSS-CUTTING PRIORITIES (SECONDARY)				
		<p>displacement of people, degeneration of national identities, loss of lives.</p> <p>CC-A5.1 Analyse socio-economic and geopolitical dynamics of the Mediterranean area as the context/ constraint to implement the actions above and common policies.</p> <p>CCA5.2 Develop environmental decision support modelling systems to sustain policy strategies, including adaptation and mitigation, for preserving the socioeconomic and environmental sustainability of marine species and habitats /CC-A3.3 Coordinated approach addressing coastal management and conservation of anthropogenic villages/ecosystems involving local communities.</p>		BLUEMED priorities with other relevant strategies, e.g. Regions).
E-D1. From traditional maritime economic to blue growth activities	E-D2. Mediterranean Blue start-ups	E-D1.2 Promote public-private partnerships to overcome the obstacles to the flourishing of new activities e.g. in emerging markets, such as, offshore wind, mineral resources in the high seas,	(3+2) & technical discussion at CSA level	Clustering of efforts within and across countries is a precursor to excellence and economic growth. Clusters have proven to facilitate the exchange of knowledge, communication and best-practices between stakeholders and potentially boost economic

BLUEMED SRIA CROSS-CUTTING PRIORITIES (SECONDARY)				
		<p>biotechnologies, coastal ecological engineering, satellite data services ... through federation of actors of research /industry, increasing visibility, international representation.</p> <p>E-D1.3 Develop economic studies to identify the specialization of different areas and regional clusters and highlight more productive and sustainable activities.</p> <p>E-D1.4 Establish innovative methodologies to assess the impacts of different programmes and actions on the evolution of maritime sectors and economy</p> <p>E-D2.1 Favour incubators and connect startups, investors, accelerators, entrepreneurs, corporate networks, universities for increasing innovative blue ecosystems</p>		<p>growth and rapid technological development in the Mediterranean region, enabling at the same time the exchange of good practices between the two shores of the Med Sea. Although it is imperative that countries in the Region move away from traditional models of economic growth to more sustainable blue activities seeking for positive impact on employment, clear deficit of clusters in the Mediterranean and lack of structures and networks is detected. In particular, this goal is linked to all the three pillars of the BLUEMED SRIA as stimulating the development of new maritime activities and the establishment of new clusters will tighten links between research, economic and innovation stakeholders. To facilitate the development of maritime clusters, financial and framework support is required from national, local and regional authorities. While establishing the action plan, whose development is actually feasible in the short term, convergences can be found with the European Network of Maritime Clusters and with the WestMED Initiative.</p>



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