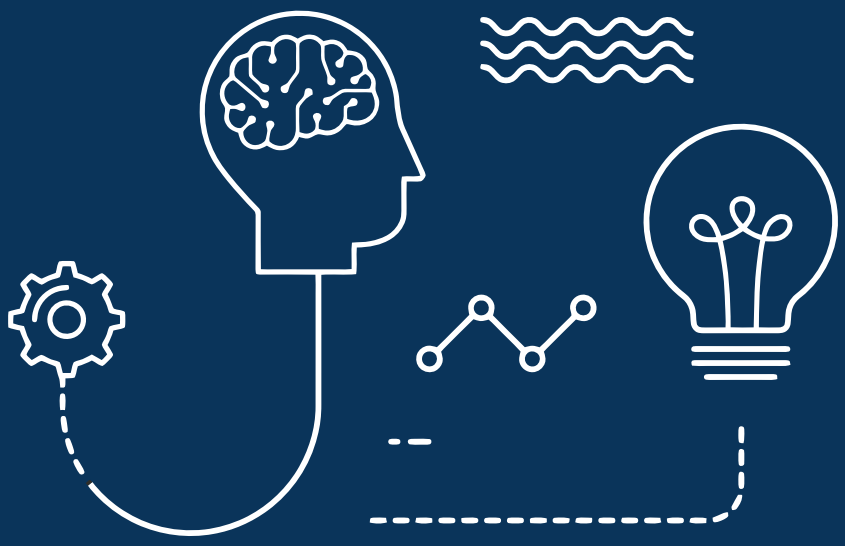

BLUEMED

PRELIMINARY IMPLEMENTATION PLAN

(CORE DOCUMENT)

Horizon 2020 – BG-13-2016
Grant Agreement 727453

Coordination and Support Action

June 2020

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727453

COORDINATION AND SUPPORT ACTION

Horizon 2020 – BG-13-2016
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PRELIMINARY IMPLEMENTATION PLAN D2.9

June 2020

Authors

Fabio Trincardi (CNR, Italy)
Margherita Cappelletto (CNR, Italy)
Andrea Barbanti (CNR, Italy)
Jean-François Cadiou (IFREMER, France)
Amélie Bataille (CNRS, France)
Mónica Campillos Llanos (IEO, Spain)
Esther Chacón Campollo (AEI, Spain)
Abraham Trujillo Quintela (AEI, Spain)
And the rest of BlueMed CSA

Group of Senior Officials BlueMed Working Group

Abuhussein Mahmoud, Jordan
Angel Dror, Israel
Aspris Christos, Cyprus
Cherif Sammari, Tunisia
Drago Aldo, Malta
Fava Fabio, Italy
Gruber Sigi, European Commission
Iglesias Marta, European Commission
Karageorgis Aris, Greece
Klein Emmanuelle, France
Lizaso Miguel, European Commission
Louanchi Feriel, Algeria
March Marta, Spain
Salihoglu Baris, Turkey
Shaltout Nayrah, Egypt
Snoussi Maria, Morocco

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Authors & Institutes Acronyms		Fabio Trincardi (CNR), Margherita Cappelletto (CNR), Andrea Barbanti (CNR), Jean-François Cadiou (IFREMER), Amélie Bataille (CNRS), Mónica Campillos Llanos (IEO), Esther Chacón Campollo (AEI), Abraham Trujillo Quintela (AEI)	
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ACRONYMS

ASC = Aquaculture Stewardship Council

CIESM = The Mediterranean Science Commission

COST = European Cooperation in Science and Technology

CPRM = Conference of Peripheral Maritime Regions

CSA = Coordination and Support Action

EASME = Executive Agency for Small and Medium-sized Enterprises

EATIP = European Aquaculture Technology and Innovation Platform

EC = European Commission

EIT Climate-KIC = European Innovation Tec

EFTP = European Fisheries Technology Platform

EMFF = European Maritime and Fisheries Fund

EMODNET = European Marine Observation and Data Network

EMUNI = Euro-Mediterranean University

ENI CBC-MED = European Neighbourhood Instrument Cross Border Cooperation in the Mediterranean

EOSC = European Open Science Cloud

ESIF = European Structural and Investment Funds

ESOF = European Science Open Forum

ESFRI = European Strategy Forum on Research Infrastructures

EUMOFA = European Market Observatory for Fisheries and Aquaculture products

EUSAIR = European Strategy for the Adriatic-Ionian Region

FAO = Food and Agriculture Organization

FARNET = Fisheries Areas Network

FoS = Friends of the Sea

GFCM = General Fisheries Commission for the Mediterranean

GSO BlueMed WG = Group of Senior Officials BlueMed Working Group

IOC/UNESCO = Intergovernmental Oceanographic Commission/United Nation Educational, Scientific and Cultural Organization

Interreg = European Union's instrument supporting cooperation across borders

LIFE = European Union's funding Programme for the environment and climate action

MedECC = Mediterranean Experts on Climate and Environmental Change

MCSA/RISE = Marie Sk odowska-Curie Actions/Research and Innovation Staff Exchange

MRE = Marine Renewable Energy

MSC = Marine Stewardship Council

MSP = Maritime Spatial Planning

PRIMA = Partnership for Research and Innovation in the Mediterranean Area

S3 = Smart Specialization Strategies

SEA-EU = European University of the Seas

SEMED = Start-up Europe Med

SRIA = Strategic Research and Innovation Agenda

UfM = Union for the Mediterranean

UNEP/MAP = United Nation Environemnt Programme/Mediterranean Action Plan

UNIMED = Mediterranean Universities Union

WESTMED = Western Mediterranean Blue Economy Initiative

WRAP = Waste and Resources Action Programme

SCOPE

The governance of our common Mediterranean Sea in the present circular scenario requires an adaptable co-owned plan of actions, interconnecting science and innovation to policy, citizens and the environment, and addressing multiple dimension, from local to international.

The **BlueMed Implementation Plan** provides a **medium-term operational tool to develop sustainable Blue Economy in the Mediterranean area**. By conveying practical inputs, it accompanies the following trajectories:

· Definition of the Smart Specialization Strategies[1] by **Regions**;

· Alignment of **national** marine and maritime strategies;

· **European** R&I Programming, with particular reference to the European Commission Horizon Europe Mission Areas[2] "Adaptation to Climate Change including Societal Transformation & Climate-neutral and smart cities" and "Healthy oceans, seas, coastal and inland waters" as well as the candidate Partnerships on "A climate neutral, sustainable and productive Blue Economy" and on "Zero-emission waterborne transport";

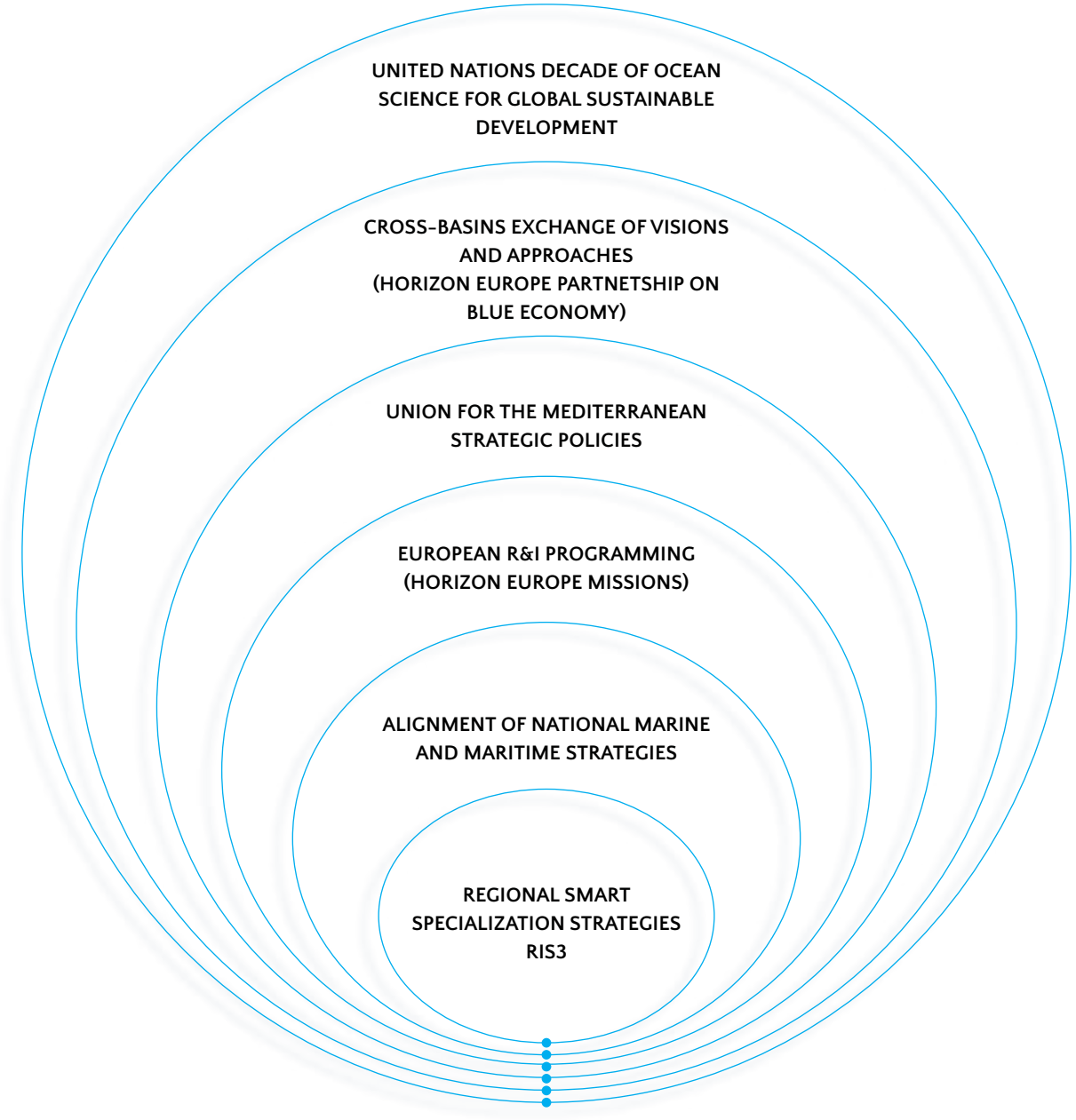
· Development of the Union for the **Mediterranean**[3] strategic policies, i.e. Ministerial on Blue Economy;

· **Cross-basins** exchange of visions and planning approaches;

· Contribution, at Mediterranean scale, to the design of the actions of the United Nations Decade of Ocean Science[4] for **global** Sustainable Development.

1 https://ec.europa.eu/jrc/en/research-topic/smart-specialisation
2 https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme/missions-horizon-europe_en
3 https://ufmsecretariat.org/
4 https://www.oceandecade.org/about

Scope of the BlueMed Implementation Plan, from local to global scale



BLUEMED KEY MILESTONES

- May 2014 BlueMed Initiative set-up in the framework of the EU Blue Growth Strategy
- December 2014 BlueMed Vision Document endorsed at the Competitive Council
- October 2015 Venice Declaration launching the BlueMed SRIA
- November 2015 UfM Declaration on the Blue Economy adopted
- October 2016 BlueMed Coordination and Support Action begins
- May 2017 Valletta Declaration on strengthening Euro-Mediterranean cooperation through Research and Innovation undersigned
- February 2018 Group of Senior Officials BlueMed Working Group established
- October 2018 Pilot Action for a healthy plastic-free Mediterranean Sea launched
- April 2019 BlueMed SRIA priorities agreed
- December 2020 BlueMed Implementation Plan

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PEOPLE ENGAGED IN THE BLUEMED COMMUNITY

INTRODUCTION

The BlueMed Research and Innovation Initiative[5] is an intergovernmental regional-scale initiative launched in 2014 during the Italian Presidency of the European Union, aiming to advance a shared vision for a healthier, productive, resilient, better-known and valued Mediterranean Sea. It addresses research and innovation through a multi-disciplinary approach, linking economy, environment and humans, to build sustainable Blue Growth by means of networks of actors and international science diplomacy efforts. Since 2017, with the signature of the Valletta Declaration[6], the Initiative is formally joined by 16 EU and non-EU Mediterranean countries and steered by the Euro-Mediterranean Group of Senior Officials BlueMed Working Group (GSO BlueMed WG), co-chaired by the European Commission and the co-chair of the Union of the Mediterranean (currently Jordan) and supported by the Secretariat of the Union of the Mediterranean.

The GSO BlueMed WG endorsed at first the **BlueMed Strategic Research and Innovation Agenda**[7] (SRIA) and then this BlueMed Implementation Plan. As part of the process, it launched on November 7th 2019 at Ecomondo fair in Rimini, the **BlueMed Pilot Initiative on Healthy Plastic-free Mediterranean Sea**[8].

Revolving around four pillars of key challenges (Table 1), the BlueMed SRIA is an **excellent framework** for the Mediterranean countries to develop and **align** their marine and maritime Research and Innovation agendas.

5 www.bluemed-initiative.eu/
6 http://www.bluemed-initiative.eu/valetta-declaration/
7 http://www.bluemed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf
8 http://www.bluemed-initiative.eu/pilot-action-on-a-healthy-plastic-free-mediterranean-sea/

BLUEMED KEY CHALLENGES		
KNOWLEDGE	ECONOMY	TECHNOLOGY
A. Mediterranean Sea ecosystems: characterize present dynamics, services, resources, vulnerability and resilience to natural and anthropogenic pressures	A. Innovative businesses based on marine bio-resources in the Mediterranean	A. Smart, greener and safer maritime transport and facilities in the Mediterranean
B. Mediterranean Sea: forecast changes of the basin under climate and anthropogenic pressures and develop services in the field of sustainable adaptation to climate change and plans for mitigation	B. Ecosystem-based management of Mediterranean aquaculture and fisheries	B. Observing systems and operational oceanography capacities in the Mediterranean
C. Hazards and protection of coastal areas and open sea in the Mediterranean	C. Sustainable tourism and cultural heritage in the Mediterranean	C. Innovative offshore industrial platforms including marine renewable energy and co-use
D. Innovative blue growth trajectories: biotechnologies, food, and the deep sea and offshore resources	D. Maritime clusters in the Mediterranean	D. Marine and coastal natural and cultural heritage in the Mediterranean: discovering, protecting and valuing
	E. Governance of maritime space and marine resources in the Mediterranean	
Cross-cutting enablers for Blue Jobs and Blue Growth		

Table 1
The four pillars (Knowledge, Economy, Technology and Cross-cutting) and related key challenges of the BlueMed R&I Agenda

To reach the objectives that will contribute to address the challenges identified in the BlueMed SRIA, a common plan based on actions needs to be implemented. The present text is a step in this direction.

The BlueMed Coordination and Support Action (CSA), which is the EC funded project supporting the development of the BlueMed Initiative, led the process to engage the community of stakeholders belonging to Mediterranean countries in the co-design and drafting of the Plan, according to a methodology described in detail in the section Methodology to develop the Implementation Plan and reach the 13 priorities.

The **level of participation reached was large and can be considered one of the major strengths of the process**, which contributed to create a cohesive BlueMed Community. The list of authors and contributors includes indeed the **GSO BlueMed WG's delegates**, the **partners of the BlueMed CSA** supporting the Initiative, the Coordinators and **National Pivots** animating the BlueMed Platforms, i.e. the tool set-up for consultation and engagement of national stakeholders, as well as other key experts.

This document present the priority goals sketched in Table 2 and addresses thematic and structuring activities to be developed in order to ignite a transformative process at Mediterranean level. It will be disseminated to relevant research and innovation funders and committers. The first opportunity for promoting the joint actions is indeed offered by:

- the Union for the Mediterranean (UfM) Stakeholders' on-line Consultation preparing the Ministerial on Blue Economy;
- the BlueMed Funders' Workshop (the last of a series of three during the lifetime of the BlueMed CSA, which has contributed to the consolidation of an *Operational Network of BlueMed Funders*).

The active role of all contributors continues to be thus crucial, also to promote, propose, discuss and agree on actions to be undertaken in the next 3-4 years.

BLUEMED PRIORITY GOALS	
THEMATIC	Understanding Pollution Impacts, Mitigation, and Remediation in the Mediterranean Sea
	Support solutions for sustainable production and consumption of food from the sea
	Preparing to climate change and define adaptation/ mitigation measures
	Linking tourism, tourists and environment
	Effective maritime spatial planning in the Mediterranean
	Greening vessels, facilities and services
	Towards an observing system of systems
	Exploring the potential of blue-biotech
	Promote the role of Marine Renewable Energies (MRE) in the energy transition phase
CROSS-CUTTING	Open data, open science, open innovation
	Building capacity, blue skills and blue professionals
	Strengthen synergies among science, industry, policy-makers and society
	From traditional maritime economy to blue growth activities

Table 2
Sketch of the BlueMed priorities. The BlueMed Pilot Initiative Healthy Plastic-free Mediterranean Sea launched in 2019 is under implementation in the framework of Priority 1.

SOCIETAL CHALLENGE IN THE MEDITERRANEAN AND POLICY SYNERGIES WITH OTHER INITIATIVES

The **BlueMed SRIA** and the derived **BlueMed Implementation Plan** are policy-driven and policy-oriented instruments aimed at inform, support and impact on a wide range of International and EU policy instruments and processes.

The Challenges, clustered in Knowledge, Economy, Technology and Cross-cutting Enablers, are qualified through Goals and Actions and cover most of the aspects related to Mediterranean marine ecosystems and resources, including most coastal and sea uses and the human dimension. As such, they intercept and influence a wide variety of policy processes and initiatives, the EC R&I Framework Programme 2021-2027 Horizon Europe[9] and specifically the Mission Area on *Healthy oceans, seas, coastal and inland waters* being among the most relevant.

BlueMed is contributing to reach several **Sustainable Development Goals**[10] of the **UN 2030 Agenda**[11], focusing on SDG14-Life below Water but also targeting SDG12- Sustainable Consumption and Production and SDG17-Partnerships for Sustainable Development.

Climate change is a key topic in the Mediterranean, being addressed in BlueMed in terms of assessment, trends, impacts on ecosystems and sea uses, as well as needs of mitigation and adaptation. A close connection is clearly needed, and already partially established, with i) international policies and targets, ii) EU strategies, with particular reference to the new **EU Green Deal**[12] proposed by the Commission and the EU strategy on adaptation to climate change, iii) scientific working groups and networks operating at EU and at Mediterranean scale (e.g. UfM WG on Climate Change and MEDECC).

9 https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en
10 https://sustainabledevelopment.un.org/?menu=1300
11 https://sustainabledevelopment.un.org/post2015/transformingourworld
12 https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

The implementation of the bulk of EU and national environmental strategies and legislation requires continuous production of knowledge on ecosystem functioning, understanding of impacts from anthropogenic pressures and of ongoing trends due to climate change, effectiveness of the measures implemented at large and local scale. The full understanding of goods and services provided by coastal and marine ecosystems is essential to address their sustainable exploitation and conservation. In particular, preserving and restoring ecosystems and biodiversity, in line with present and future objectives of the **UN Convention on Biological Diversity**[13] and the **EU Biodiversity Strategy**[14].

The specific characteristics of the Mediterranean Sea make its equilibrium delicate and strategic at the same time, from a political and economic point of view as well as from an ecological point of view. The Mediterranean is the meeting point of three continents and it is crossed by a third of the world maritime traffic. Its biological and mineral resources are of fundamental importance for the countries bordering its shores. Therefore, those resources are the subject of a wide and articulated international cooperation activity aimed at reconciling very different interests. It is worth mentioning that part of the Basin, although relatively close to the mainland, is still subject to the legal regime of the high seas, and therefore open to free use and exploitation by all states (UNCLOS, art. 87). A clear definition of the **Ocean Governance** scalable to the Mediterranean is the prerequisite for rational organization of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect marine ecosystems, and to achieve social and economic objectives in an open and planned way. As such, Maritime Spatial Planning is a key enabling factor for a sustainable development of sea economy, according to EU **Directive 2014/89/EU**[15]. The preparation of the maritime spatial plans will offer the opportunity to all Mediterranean countries, to rethink and improve in a transboundary context their strategy on sea economy, as sectoral and as integrated strategies, encouraging multi-purpose uses, and to develop a vision for the future.

13 https://www.cbd.int/
14 https://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm
15 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089

The need and the importance of better Ocean Governance is recognized by the **International Ocean Governance Communication** adopted by the EC in October 2016 (Join(2016)49) and the resolution approved by the European Parliament on 16 January 2018 (2017/2055(INI)). The Communication represents an integral part of the EU's response to the UN 2030 Agenda for Sustainable Development and contains 14 sets of actions in three priority areas: i) improving the international ocean governance framework; ii) reducing pressure on oceans and seas and creating the conditions for a sustainable blue economy; iii) strengthening international ocean research and data. Actions 13 - Strengthening investment in 'blue' science and innovation and 14-International ocean research, innovation and science partnerships make specific reference, among others, to the BlueMed Initiative.

The **Circular Economy Package**[16] (COM(2015)614), adopted by the Commission on 2 December 2015, is presently the main tool to support the transition towards a more circular economy in the EU. It includes legislative proposals on waste, with long-term targets to reduce landfilling and increase recycling and reuse, lowering energy consumption and carbon dioxide emissions levels. Since then, the Commission has put forward a number of key initiatives (COM2017(33)) to support Circular Economy. These initiatives cover the full value chain, from production to consumption, waste management and use of secondary raw materials. A specific strategy was recently adopted on **plastics in a circular economy perspective (COM(2018)33)**, with a detailed list of future EU measures to implement it. The Circular Economy concept applies in the Blue Growth arena to almost all sectors of sea economy (e.g. energy, fisheries, transport, tourism) and all components of the value chain (production, consumption, waste management and recycling). Margins for innovation are huge on materials, technologies and processes and ranges of options for implementation are wide. Policy measures are crucial in this sense, while research and innovation from public and private actors is key.

16 https://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF

The challenge on "how can more food and biomass be obtained from the oceans in a way that does not deprive future generations of their benefits" (Commissioner Karmenu Vella request to the EU's Scientific Advice Mechanism) can be answered through a combination of actions that require all consolidated knowledge of marine systems and innovative ideas and technologies. They span from measures for more sustainable fisheries, new aquaculture solutions, integrated use of by-products and co-uses related to the exploitation of marine biomasses and new sources of raw materials, new fishing and farming grounds. As such, BlueMed should significantly contribute to the **EU R&I initiative FOOD2030**[17], on Food and Nutrition Security (FNS), the broader EU strategy **"from Farm to Fork"**, and to the **FAO-GFCM Initiatives MedFish4Ever** and **FishForum**.

BlueMed is comprehensively relevant for the **EU Integrated Maritime Policy**[18] (COM(2007)575) and the **Blue Growth Strategy**[19] (COM(2012)494; COM(2014)254/2) topics and challenges are expressed also through Goals and Actions on safety and efficiency of sea transportation systems, on marine renewables to stimulate the contribution of the sea to the ongoing energy transition towards a low-carbon economy and EU Green Deal objectives, on promotion of sustainable coastal and maritime tourism through smart technologies and services.

Most of the above challenges and objectives are part of the Agendas, Strategic documents and Action Plans of existing **Regional and Territorial Frameworks, Strategies and Initiatives** such as **Barcelona Convention**[20], **WestMED**[21], **EUSAIR**[22], **UfM WG on Blue Economy**[23] **and CPMR**[24]. Synergies with BlueMed Initiative are already well established and should be further reinforced during and for the deployment of the Implementation Plan.

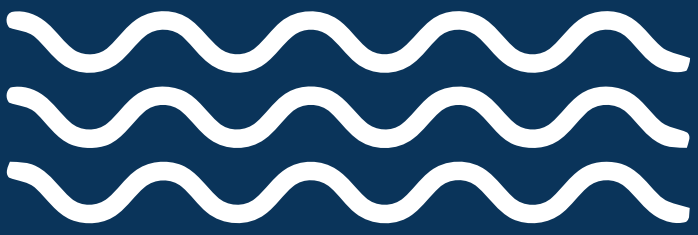
17 https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=food2030
18 https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0575:FIN:EN:PDF
19 https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en
20 https://web.unep.org/unepmap/1-barcelona-convention-and-amendments
21 https://www.westmed-initiative.eu/
22 https://www.adriatic-ionian.eu/
23 https://ufmsecretariat.org/ufm-working-group-blue-economy/
24 https://cpmr.org/

Moreover, collaboration and synergies with other **Sea Basin Initiatives** such as Baltic, Atlantic, North Sea and Black Sea is ongoing and should be reinforced, developing cross-border research and innovation cooperation at and across the sea-basin scales on both thematic and structural actions, in view of the Partnership tool foreseen in the next R&I EU Framework Programme Horizon Europe.

Finally, BlueMed shall promote its Implementation Plan in the framework of the Mediterranean component of the **UN Decade of Ocean Science for Sustainable Development 2021-2030**[25], that aims at providing for the seas&ocean community and beyond, a pathway to work collaboratively, demonstrating the productivity and relevance of the global science community for addressing societal issues, as well as raising the visibility of these collective actions.

25 https://en.unesco.org/ocean-decade

PLANNED JOINT ACTIONS



A set of Strategic and Promotional Joint Actions is proposed to implement 13 priorities, including thematic and cross-cutting, as from 2020 and beyond. The BlueMed priorities were selected:

- following the endorsement of the BlueMed SRIA updated version in 2018 by the GSO BlueMed WG;

- according to a methodology set-up by the BlueMed CSA;
and developed via:

- a collaborative work led by co-champion countries (two per each priority);

- further consultation with key stakeholders (about 48) via the BlueMed Platforms.

The main objective of the described Joint Actions that have been designed taking into account the multiple synergies needed to effectively develop them, is to address the respective priorities and promote activities for cooperation and collaboration between Mediterranean countries, towards the capitalisation and alignment of marine research programmes and strategies to fulfil the objectives of the BlueMed Initiative.

HOW TO READ THE TEXT

- Priority number

- SRIA key challenge(s) the priority is connected

- Title of the Priority

- Statement summarizing the relevance of the Priority

- Operational receipt to reach a priority goal

- A set of Strategic Actions, i.e. larger and medium-long term initiatives and activities, with specific scientific or structural content, that require strong commitment and additional dedicated resources from Research Funders. For each Strategic Action, it is reported:

- A set of Promotional Actions that are feasible to be possibly achieved with the support of the BlueMed CSA within the project´s lifetime

An indicative timing for launching	
The suggested duration, i.e. timeframe	t <1-1 yr tt <5 yr ttt >5 yr
The proposed instrument to undertake them and	
A tentative budget scale	€ < 50 k€ €€ < 1 M€ - 1 M€ €€€ < 10 M€ €€€€ > 10M€

(PRIORITY 1)

UNDERSTANDING POLLUTION IMPACTS, MITIGATION, AND REMEDIATION IN THE MEDITERRANEAN SEA

Support the proper management and improvement of the marine environment and connected activities from filling the knowledge gaps to identifying recycling solutions, in the perspective of the blue circular economy and the Green Deal. Improve in parallel the understanding on the functioning of the Mediterranean Sea ecosystem.

Develop coastal and marine potential hazard/pollution sources maps to identify hot spots and areas that are particularly exposed to the impact of multiple stressors and propose possible solutions.

Define distribution, concentration and provenance of all forms of garbage at the sea surface, within the water column, the sea floor and the coastal-estuarine environments; rise awareness through literacy and citizen-science.

Quantify impact in terms of economic activities, jobs, well-being of citizens and ecosystems, of plastic waste; reduce its generation, prevent littering and exploit opportunities from collection and recycling.

Explore and propose solutions to reduce the input of pollutants from atmosphere, land and sea, linking with monitoring/mitigation technology actions.

Measure and identify emerging chemical compounds from terrestrial sources, determining contaminant dispersal in all marine matrices; characterize sources, pathways and effects on marine ecosystems; develop early warning tools.
Fill gaps in understanding the Mediterranean Sea dynamics, biogeographic patterns, biodiversity, and ecosystem functions 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.

Strategic Action/1	**Scale up of the BlueMed Pilot Action on Healthy Plastic Free Mediterranean Sea**
Indicative starting time	2021
Suggested timeframe	tt
Proposed funding programmes and instrument	Horizon Europe – Mission area: Healthy oceans, seas, coastal and inland waters, in a Multi-Programme Framework (e.g. EMFF, Interreg, ENI CBC-MED, LIFE) & National Pilot Hubs & Summit of the Two Shores
Tentative budget	€€€

Strategic Action/2	**Joint JPI-Oceans Action on 'Science for Good Environmental Status'**
Indicative starting time	2021

Suggested timeframe	t
Proposed funding programmes and instrument	Co-fund call (variable geometry)
Tentative budget	€€

Promotional Action/1	**e-training course on marine litter**
Indicative starting time	September 2020
Proposed instrument	BlueMed CSA task
Tentative budget	€

Promotional Action/2	**BlueMed & JPI-Oceans joint workshop** on 'Science for Good Environmental Status'
Indicative starting time	September 2020
Proposed instrument	BlueMed CSA task, promoted by Italy and Co-champions, in coordination with JPI-Ocean Secretariat
Tentative budget	€

(PRIORITY 2)

SUPPORT SOLUTIONS FOR SUSTAINABLE PRODUCTION AND CONSUMPTION OF FOOD FROM THE SEA

The economic driver "Food" is one of the shared Mediterranean cultural roots. Improvements in the fisheries and aquaculture sectors are necessary with the aim to make these economic activities more environmentally and economically sustainable. The concept of Sustainable Food Consumption contrasts with the increase of the demands of food, e.g. during touristic season, and the increase of food waste, requires new practices leading to improved society behaviours, better consumer practices, implementing the European Strategies 'From farm to fork', Food 2030, and at global level the relevant UN-Sustainable Development Goals.

Identify and protect marine biota as a new source of proteins for human consumption.

Develop Mediterranean aquaculture: new management tools, ecosystem-based approach, tackling pathogens; develop conceptual models for Integrated MultiTrophic Aquaculture (IMTA).

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.

Rethink the approach to the management of by-products and by-catch from fisheries and aquaculture in the production chain.

Assess Fish Stocks in a holistic frame taking into account climate change and alien species diffusion.

Develop innovative methods and tools for monitoring and governing Mediterranean aquaculture and fisheries, in line with existing policies.

Strategic Action/1	**Call of calls:** enhance/capitalize on calls for projects as Blue Labs, EU funding calls, Research organizations to launch a **Call for competition on e.g. Fishing and aquaculture eco-label products, Research on multi-modal platforms (including offshore wind farms and aquaculture, linking with P9 on Marine Renewable Energies), Essential Fish Habitat Approach, Impact of Trawling, etc.**
Indicative starting time	2021
Suggested timeframe	tt
Proposed funding programmes and instrument	ESIF/EMFF + PRIMA + Aquatic Pollutants ERANET Cofund
Tentative budget	€€

Promotional Action/1	**Capacity building activity on artisanal fisheries connecting with the possible scale-up of the BlueMed Start-up Action LabMaf fisheries connecting with the possible scale-up of the BlueMed Start-up Action LabMaf**
Indicative starting time	September 2020

Proposed instrument	BlueMed CSA task
Tentative budget	€

Promotional Action/2	**Workshops** for targeted stakeholders, such as Maritime Clusters, Research Organizations and/ or the European Commission to **share BlueMed information about production of food from the sea, consumption and security**.
Indicative starting time	May 2021
Proposed instrument	European Maritime Day Workshop proposed by the BlueMed CSA in alignment with relevant H2020 projects (e.g. PerformFish, MedAID, Summer, BlueGrowthFarm, SEAFOODOF TOMORROW)
Tentative budget	€

Promotional Action/3	**Coordination Workshop entitled "It's time to align! Food production, security and consumption from the Sea" to develop Strategies and Plans designed for sustainable fishing, aquaculture and seafood** via alignment and coordination with WestMED and EUSAIR, other organizations and initiatives (GFCM-FAO; WRAP; UfM), EU organizations (FARNET, EATIP, EFTP, EUMOFA) and coordination for eco-label aquaculture and fishing products (MSC, FoS, ASC, and Advisories Councils for Fisheries and Aquaculture).
Indicative starting time	December 2020 (possibly within the BlueMed CSA multi-thematic Conference)
Proposed instrument	Joint BlueMed CSA taskforce with and MedFish4ever Initiative and GFCM-FAO
Tentative budget	€

Promotional Action/4	**Exchange of best practices and dissemination between Mediterranean countries on good food practices to society (reduce consumption and tourism food waste, co-design new strategies to preserve and freeze products, etc.)**
Indicative starting time	March 2021
Proposed instrument	BlueMed CSA task in alignment with an ongoing relevant project (e.g. Interreg STREFOWA) and a Communication event (if possible engaging renowned Chefs from several Med countries)
Tentative budget	€€

(PRIORITY 3)

PREPARING TO CLIMATE CHANGE AND DEFINE ADAPTATION AND MITIGATION MEASURES

The Mediterranean has been recognized as a climate change vulnerability "hotspot" by the IPCC. There is a need to fill gaps in scientific knowledge with regards to understanding regional climate change and its impacts on the ecosystems and the services they provide and hence on human population, its health and safety by exploiting and improving observation capacities. Contribution is expected on EU and global policies, including UN-Sustainable Development Goals.

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 sprawling of invasive species favored by increasing temperature of the water column.

Develop, enhance and deliver user-friendly tools for disseminating climate information related to Mediterranean atmosphere, coastal and deep ocean areas.

Develop climate adaptation and mitigation strategies coupling Climate Change and Blue Growth activities targeting the Mediterranean coasts.

Identify how activities, such as freshwater use, can enhance impacts of climate change through increased coastal subsidence, salt wedge penetration and ultimately increased flooding and desertification risks.

Launch a Pan-Mediterranean program on coastal freshwater reserves: quantification of reservoirs, state of the water (available quantity, 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 freshwater minimizing negative impacts on shallow marine ecosystems.

Develop operational observing platforms, early warning systems and decision matrices to address natural marine disasters such as tsunami events, coastal slides, storms, while assessing and controlling progressive coastal and geological processes such as erosion, habitat destruction or coastal landslides.

Standardize and expand coastal-monitoring systems across the Mediterranean region to maintain updated data and information on extreme climatic events, sea-level rise, coastal erosion and other coastal risks.

Strategic Action/1	**Integrated Programme** to increase knowledge on **the impact of global change on Mediterranean marine ecosystems** (food webs, biodiversity, habitats) and therefore on the following key social and economic drivers: - Fisheries and aquaculture (linking with P2 on Sustainable food production); - Tourism (*linking with P5 on Tourism*); - Transport Routes (*linking with P7 on Transport*). by exploiting appropriate observing systems (*linking with P4 on Observing Systems*).
Indicative starting time	2022

Suggested timeframe	tt
Proposed funding programmes and instrument	Horizon Europe – Mission Areas: Adaptation to Climate Change including Societal Transformation & Climate-neutral and smart cities & Healthy oceans, seas, coastal and inland waters targeted cross-Missions R&I actions & European Investment Bank Blue Sustainable Ocean Strategy (Blue SOS) & LIFE Call
Tentative budget	€€€€

Promotional Action/1	**Climate-KIC Start-ups**
Indicative starting time	September 2020
Proposed instrument	EIT Climate-KIC call
Tentative budget	€€

Promotional Action/2	**Towards a Climate Change Mediterranean Sea Capital of the Year**
Indicative starting time	January 2021
Proposed instrument	Joint BlueMed CSA, UNEP/MAP & UfM task
Tentative budget	€

(PRIORITY 4)

TOWARDS AN OBSERVING SYSTEM OF SYSTEMS

Support marine and coastal observation to better understand the complex marine ecosystem and its functioning; to measure and assess its evolution under different stressors and manage resources sustainably; to provide essential information for decision-making; to identify risks and set-up a rapid response to hazards. Improve in parallel the accessibility to open multidisciplinary and high quality data for scientists and other key stakeholders involved in Blue Growth activities. Strengthen the collaboration with non-EU Mediterranean countries by promoting the use of existing data; sharing of new technologies; participating in joint monitoring of the marine environment and sharing the commitment for sustainable development.

Develop technologies towards an integrated Mediterranean observing system, capitalizing on existing networks and 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.

Support long term and long-time series observing systems for climate change's impact evaluation.

Implement ICT, Big Data Analysis and Cloud Service Platforms to take advantage of multi-sectoral data management and sharing opportunities for the Mediterranean.

Develop appropriate systems to foster Citizen Science initiatives and protocols to complement environmental and ecosystem monitoring.

Strategic Action/1	**Regional Task Force on Coastal Observing Systems** for defining laboratories of reference; set-up a coordinated network of coastal multidisciplinary observing stations; reinforce the access to land-based facilities and strengthen Transnational Access calls to facilitate access for non-EU scientists
Indicative starting time	March 2021
Suggested timeframe	ttt
Proposed funding programmes and instrument	Cross-border cooperation Programme, Horizon Europe, EMFF, Interreg Med
Tentative budget	€€€

Strategic Action/2	**Cooperation Programme for environmental** data collection and sharing between marine economic sectors, environmental authorities, research sectors, and citizens
Indicative starting time	March 2021
Suggested timeframe	ttt
Proposed funding programmes and instrument	Interreg Med, Cross-border cooperation Programme, EMFF, HE
Tentative budget	€€€

Promotional Action/1	**Mediterranean Conference on marine and coastal observation**
Indicative starting time	Annual meeting, starting March 2021
Proposed instrument	Copernicus, JPI Oceans, EMFF, UNEP/MAP
Tentative budget	€ (for one meeting)

(PRIORITY 5)

LINKING TOURISM, TOURISTS AND ENVIRONMENT

Develop sustainable and low environmental footprint solutions as precondition for preserving the natural and cultural heritage in the long term. Implement the transition towards a more sustainable tourism with the support of socio-economic research and the exploitation of prospects offered by the digitalization to support decisions making, including the "European Strategy for more Growth and Jobs in Coastal and Maritime Tourism". Since tourism is a key asset of Mediterranean coastal regions, while exerting high pressures on the coastal and marine environment, this integrated goal calls for co-tackling the following:

- Preparing to climate change and define adaptation/mitigation measures;

- Reducing the coastal risk of disasters and their effects;

- Technology solutions for the Mediterranean natural and cultural heritage including augmented reality and underwater/seafloor remote observations;

- Building capacity, blue skills and blue professional.

Promote synergies between tourism and other productive activities encouraging networking with other economic sectors and among destinations.

Develop monitoring and evaluation systems of tourism flows, assessing carrying capacities of destinations, to support an efficient management of tourism flows and impacts leading to an effective governance of a greener and sustainable tourism industry.

Develop methodology, tools and systems for assessing environmental impacts of tourism and its drivers in the Mediterranean area focusing on coastal urbanization trends (tourist ghost cities) and related pressures to improve protection of coastline ecosystems.

Focus on big data analytics and ICT technologies and services to strengthen access to sustainable development policies, more efficient use of natural resources and cultural heritage, and management of infrastructures in coastal and marine areas.

Train a new generation of marine technicians/scientists to conduct research on the protection and valorization of the marine cultural heritage, including 3D and 4D rendering and augmented observation.

Strategic Action/1	**Digital ecosystems for coastal tourism destinations to support the design of policies:** from opportunities' mapping to intelligence production
Indicative starting time	2023
Suggested timeframe	tt
Proposed funding programmes and instrument	Cross-border cooperation Programme/R&I action & COST Action
Tentative budget	€€

Promotional Action/1	**Connecting multiple actors for integration:** Panoramed, UNWTO, EU Sustainable Tourism Group
Indicative starting time	2021
Proposed instrument	Mobilization of (Co-champion countries) National Pivots
Tentative budget	€

Promotional Action/2	**Beyond commodities: Exploit tourism as vehicle for environmental-friendly behaviours**
Indicative starting time	December 2020 (possibly within the BlueMed CSA multi-thematic Conference)
Proposed instrument	Stakeholders' (e.g. ship companies) Conference
Tentative budget	€

(PRIORITY 6)

EFFECTIVE MARITIME SPATIAL PLANNING IN THE MEDITERRANEAN

MSP is about promoting the rational use of the sea and improving decision-making; it is an essential part of the governance of the maritime space in the Mediterranean Sea. It is at the base of any socio-economic development and conservation effort. 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, aquaculture, maritime transport, dredging/sand extraction and coastal tourism, but it also applies to offshore and deep-sea environments and activities. 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. 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, as well as it requires synergies among science, industry, policy-makers and society.

Promote coherence between terrestrial and maritime planning, improving the understanding at proper spatial scales of Land-Sea Interactions (LSI),

integrated management of land and maritime activities and resources and reducing impacts to the marine environment.

Address transboundary maritime spatial planning issues to understand problems and opportunities (social, economic, environmental), strengthen knowledge on environmental pressures across borders and raise awareness on a better definition of maritime zones in the Mediterranean as an important enabling factor for shared and sustainable blue growth.

Raise awareness, develop better understanding of MSP needs and drivers and test solutions for planning and management of deep-sea spaces and resources of the Mediterranean in a transboundary framework.

Develop better understanding and capability to quantify cumulative effects/ impacts of anthropogenic pressures on environmental components and resources, to support MSP scenarios development and robust planning decisions, in close connection with MSFD objectives and measures and other conservation measures (i.e. potential areas for new MPAs, improved connectivity of the MPA network, transboundary offshore protected areas, reduced impact on existing MPAs from other maritime uses).

Define 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, to inform and improve adaptive planning and management scenarios.

Build a "Knowledge Catalogue" for MSP in the Mediterranean and promote the connection of existing Geoportals, from national to EU to International, on environment and human activities.

Promote innovative technologies, services and coastal ecological engineering solutions for a sustainable management and resulting protection of coastal areas from coastal erosion, flooding and pollution.

Improve stakeholder engagement methods and practices in support of effective marine spatial planning.

Strategic Action/1	**Mediterranean MSP Knowledge Catalogue** (MSPKC, a dedicated web and collaborative catalogue collect and share metadata for MSP-relevant datasets, portals and tools)
Indicative starting time	2020
Suggested timeframe	t
Proposed funding programmes and instrument	EMFF, ENI CBC-MED
Tentative budget	€€

Strategic Action/2	Monitoring, supporting, adapting the implementation process of MSP in the Mediterranean, in connection with MSEG DG Mare, UNEP-MAP, Mediterranean Countries and through the participation of BlueMed as Observer in the new pilot project MSP-MED (EMFF-2019-1.2.1.8) launched by EASME.
Indicative starting time	2020-2022
Suggested timeframe	t
Proposed funding programmes and instrument	BlueMed-CSA task, EMFF, HE, Interreg, National Funds (variable geometry)
Tentative budget	€€

Promotional Action/1	**UNESCO/IOC-DG MARE MSPglobal Initiative** – Pilot on the Western Mediterranean
Indicative starting time	2019-2021
Proposed instrument	BlueMed CSA task, UNESCO/IOC-DG MARE
Tentative budget	€

Promotional Action/2	**OECD-UNESCO/IOC-BlueMed joint Conference on Ocean Economy and Innovation:** Linking economy potential and marine ecosystem health through Maritime Spatial Planning
Indicative starting time	September 2020
Proposed instrument	BlueMed CSA task, UNESCO/IOC, National funds
Tentative budget	€

Promotional Action/3	**Training courses on MSP for sustainable Blue Growth (two folded Action) on:** **- "Science-Policy-Society interactions in ecosystem-based marine resource management and planning";** **- "Ecosystem-Based Management in/for MSP"**
Indicative starting time	2020-2021
Proposed instrument	BlueMed CSA task, in collaboration with Interreg MED Biodiversity Protection Community
Tentative budget	€

Promotional Action/4	**Joint capitalization with Projects ADRION-Portodimare and MED-Pharos4mpas**
Indicative starting time	2020
Proposed instrument	BlueMed CSA task, in collaboration with Portodimare and Pharos4mpas Projects
Tentative budget	€

(PRIORITY 7)

GREENING VESSELS, FACILITIES AND SERVICES

Develop innovative solutions to reduce the environmental footprint of commercial as well as tourism-oriented maritime transports and port infrastructures in line with the European Commission's long-term strategy for a climate neutral society by 2050 and the Marine Strategy Framework Directive. Monitor the effectiveness of the implemented strategies and contribute to the proposal of new regulations.

Implement multidisciplinary integrated methodologies to evaluate the impact of ships and harbours on the environment at transnational level, exploit new technologies and tools to monitor pollution.

Towards zero emission ships and harbors: support the use of LNG, methanol, hydrogen, biofuels, the electrification of ships and ports, the use of fuel cells, the design of solar and wind power generation, the optimization of energy management, the research on new materials and technologies for drag, biofouling and noise reduction.

Develop new vessel concepts, i.e. flexible, modular and high efficiency ships, using new materials (e.g. high strength, reduced weight, smart, etc.)

and advanced design and production techniques, with lower manufacturing, construction, installation, dismantling and recycling costs from the perspective of the circular economy.

Design and develop innovative green infrastructure solutions and tailored software to improve the sustainability of logistics and ports.

Towards efficient Motorways of the Sea (MoS) and their connections among Ports: improve traffic monitoring system, develop feasibility studies, identifying main obstacles, and innovative methodologies/tools for the efficient functioning of the existing MoS and the establishment of new ones.

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.

Strategic Action/1	**BlueMed labelled cross-cutting best practices to address underwater noise**
Indicative starting time	2023
Suggested timeframe	t
Proposed funding programmes and instrument	JPI-Oceans, Horizon Europe (e.g. co-Programmed candidate Partnership on Zero emission waterborne transport), Interreg MED, Eranet Cofund "Martera"
Tentative budget	€€€

Strategic Action/2	**Joint BlueMed-WestMED Action on 'Emission Control Area Implementation'**

Indicative starting time	2021
Suggested timeframe	t
Proposed funding programmes and instrument	Co-fund Call, Horizon Europe, EMFF
Tentative budget	€€

Strategic Action/3	**Multidisciplinary R&D to implement tailor made solutions for ports of different type and size towards zero impact infrastructures, services and operations** (e.g. sustainable building, clean energy generation and storage, bunkering, waste management). **Definition of regulations for docking in Mediterranean ports.**
Indicative starting time	2021
Suggested timeframe	tt
Proposed funding programmes and instrument	Interreg, Horizon Europe (e.g. co-Programmed candidate Partnership on Zero emission waterborne transport), Connecting Europe Facility (CEF) Transport
Tentative budget	€€

Promotional Action/1	**Multidisciplinary, trans-Mediterranean training course on green technologies for shipping**
Indicative starting time	2021

Proposed instrument	BlueMed CSA task/ specific call (EMFF, Horizon Europe, Co-Programmed Partnerships) Pharos4mpasProtection Community Protection Community
Tentative budget	€

Promotional Action/2	**BlueMed-Waterborne Joint meeting on "Low Carbon Sustainable and Intelligent Marine Technology"**
Indicative starting time	December 2020 (within the BlueMed CSA multi-thematic Conference)
Proposed instrument	BlueMed CSA task
Tentative budget	€

Promotional Action/3	**Scale up of the BlueMed Start-up Action BlueBoatsMed**
Indicative starting time	by October 2020
Proposed instrument	media campaign and participation to conferences
Tentative budget	€

(PRIORITY 8)

EXPLORING THE POTENTIAL OF BLUE-BIOTECH

The marine environment is a potential key provider of biotechnological novelty. The high biodiversity of Mediterranean marine organisms might have a high potential for applications in biotechnology, materials and engineering. To generate new products and services, the biotechnological potential of the marine resources need to be bridged with their exploration and exploitation. This implies to fill a frontier knowledge gap at the crossroads of biotechnology, food production, and sustainable use of bio-resources with socioeconomic impacts in several fields, exploiting convergences with biotech infrastructures, and access the still-untapped marine biotechnological resources on a larger scale.

Increase and improve the knowledge on the Mediterranean Sea as a source of new molecules and compounds deriving from marine microbes, algae, seaweeds and invertebrates to be used for new drugs, functional ingredients for human health, industry and environmentally-applicable molecules or organisms.

Fostering collaborative research through transdisciplinary fields of expertise (e.g. genomics, data bases, outreach, economics) to evaluate Blue Biotechnologies for their economic impact as a growing field, and promote:

(i) the concept of industry-academia partnerships as a win-win collaboration system; (ii) education through training the next generation of marine biotechnologists.

Create, improve, share or implement dedicated regulatory frameworks and policies on the use and exploitation of Mediterranean Sea bio-resources and/or biomasses for biotechnological purposes, and to share such common policies and practices among all the actors of blue-biotech in the Mediterranean area.

Strategic Action/1	**Panoramed Innovation Project on Blue Bioeconomy towards a strategic Alliance for Blue Bioeconomy in the Mediterranean**
Indicative starting time	2020
Suggested timeframe	tt
Proposed funding programmes and instrument	Interreg-MED, Panoramed Call for Strategic Project
Tentative budget	€€

Promotional Action/1	**Thematic conference on Mediterranean Blue Biotech**
Indicative starting time	December 2020 (within the BlueMed CSA multi-thematic Conference)
Proposed instrument	Joint BlueMed CSA and Ocean4Biotech COST Action operational thematic conference, BioBased Industries Joint Undertaking (BBI JU)
Tentative budget	€

Promotional Action/1	**Training course on Blue Biotechnologies and Blue Bio-economy aiming at the creation of blue careers**
Indicative starting time	January 2021
Proposed instrument	Call for opportunities, e.g. Bluebio COFUND additional activities, BlueMed CSA, DG-MARE/ EASME Blue skills call
Tentative budget	€

(PRIORITY 9)

PROMOTE THE ROLE OF MARINE RENEWABLE ENERGIES (MRE) IN THE ENERGY TRANSITION PHASE

Increase the competitiveness of MREs with respect to other consolidated forms of renewable energy. Strengthen research efforts to tackle remaining technological gaps and to further exploit the potential of sea and wind. Analyse potential co-activities of MREs for designing integrated multi-purpose platforms that can serve both energy and other maritime sectors. Define and launch awareness-raising actions among industries, research sector and civil society to increase public understanding and facilitate the acceptance of MRE projects. Encourage governments to provide regulatory frameworks and clearly evaluate available marine renewable resources to support the development of MREs. Strengthen capacity building and the development of specialised skills to increase the fraction of installed MRE power plants.

Develop large demonstration projects to sustain commercial MREs development, including Floating Offshore Wind Turbine which is particularly relevant in the Mediterranean

Develop technology design tools for MRE: impact of biofouling and corrosion on components, behavior of structures/components in fatigue, innovative monitoring strategies, anchoring.

Tool development farm architecture and integration with electric networks and energy storage (Hydrogen...).

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.

Strategic Action/1	**Focus on the interactions of MREs with marine ecosystems and socio-ecosystems studies:** identification of the physical-biological coupling in the modifications induced by the MRE projects, instrumentation adapted to the monitoring, modelling the reef effect locally and globally and the interactions with avifauna.
Indicative starting time	2022
Suggested timeframe	tt
Proposed funding programmes and instrument	Horizon Europe, Interreg MED
Tentative budget	€€€

Strategic Action/2	R&D on multi-purpose platform combining green energies production and storage (hydrogen, etc.) with fishing and aquaculture, tourism, offshore research, marine life and environmental monitoring, maritime surveillance and pollution monitoring. **Modelling of economic impacts and interactions with other maritime uses and activities.**
Indicative starting time	2022
Suggested timeframe	ttt

Proposed funding programmes and instrument	Horizon Europe, Interreg MED
Tentative budget	€€€

Promotional Action/1	**Competence and Training Centre on Marine Renewable Energies**
Indicative starting time	starting 2021
Proposed instrument	Co-fund centre, promotion of this activity and relevant lobbying actions to be led by co-champion countries. DG-MARE/EASME Blue skills call, Erasmus +.
Tentative budget	€€€

Promotional Action/2	**Mediterranean Conference on Marine Renewable Energies**
Indicative starting time	Annual meeting, starting April 2021
Proposed instrument	Thematic conference sponsored by private industries and cities/local communities active in the field, support from relevant maritime clusters. Relevant lobbying actions to be led by co-champion countries.
Tentative budget	€ (for one meeting)

(PRIORITY 10)

OPEN DATA, OPEN SCIENCE, OPEN INNOVATION

Support knowledge sharing about health, evolution and functioning of Mediterranean basin's marine and coastal ecosystems with researchers, public policy makers and private sector to ensure the preservation of the basin's resources, develop sustainable activities, control pressures and anticipate the responses to global change. Strengthen the open access to high-quality data both to create a common understanding of Mediterranean challenges and to support smart and innovative data applications in marine-related economic activities.

The goal calls to support in parallel the development of a Mediterranean observing system of systems to enable the collection of high-quality data on marine and coastal environments (see Priority 4).

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.

Create a ''Blue Cloud" for Marine data accumulation (e.g. oceanographic, bioptical, genomics, -omics, and -metaomics) at Mediterranean level. 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 their corresponding Blue Cloud database.

Implement ICT, Big Data Analysis and Cloud Services Platforms to take *advantage of multi-sectoral data management and sharing opportunities for the Mediterranean.*

Integrate the Information Communication Technologies-ICT (Big Data, Internet of Things-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, MREs, transports (e.g. Motorways of the Sea, Locations of Ports, navigation conditions), etc.

Strategic Action/1	**Blue Economy Mediterranean Observatory MedBlueNet** (integrated data service connected with Emodnet and Copernicus)
Indicative starting time	2021
Suggested timeframe	ttt
Proposed funding programmes and instrument	Horizon Europe, alignment and coordination with relevant initiatives and bodies (Emodnet, Copernicus, Eurostat, Medstat, EOSC, ESFRI)
Tentative budget	€€€

Strategic Action/2	**Creation of a Mediterranean European Open Innovation Network in blue technologies**
Indicative starting time	2021
Suggested timeframe	ttt
Proposed funding programmes and instrument	DG Growth, Interreg, ENPI, UfM
Tentative budget	€€

Promotional Action/1	**Mediterranean Blue Data Conference towards an open data approach to share best practices within/ among countries**
Indicative starting time	Annual meeting, starting March 2021
Proposed instrument	Copernicus, Horizon Europe, UNEP/MAP, UfM, Eurostat
Tentative budget	€ (for one meeting)

Promotional Action/2	**Blue Mediterranean Open Access Journal**
Indicative starting time	Bi-annual publication, starting 2021
Proposed instrument	Co-fund open access journal with willing partners/ countries. Promotion of this activity and relevant lobbying actions led by supporting co-champion countries. Engage the support of the EC and other relevant bodies/initiatives/national funds.
Tentative budget	€€

(PRIORITY 11)

BUILDING CAPACITY, BLUE SKILLS AND BLUE PROFESSIONALS

The human element is a crucial factor to responsibly unlock the Blue Growth potential of the Mediterranean Sea. Furthermore, human capital constitutes an overarching condition to achieve the region's economic, knowledge and technology priorities, in terms of research and innovation. There is a need to close the skills gap between the education on offer and the labour market by increasing cooperation between academia and industry and increasing the attractiveness of the blue sectors. In addition, the sustainability of blue jobs is related to the degree of ocean literacy. The goal shall be reached in the framework of international cooperation and through coordinated transboundary networks.

Develop a network of training research centres to train new professionals on sampling, recording and working on marine environmental, engineering and scientific level.

Align high-education curricula, design joint MSc, PhD programs, short-term scientific exchanges, to prepare the next generation of blue-economy scientists, technologist and entrepreneurs. Establishing a coordinated network of marine institutes, universities, stations, observatories and public and private companies.

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.

Exploit new digital technologies for training purposes, including for operators, including Virtual or Augmented Reality.

Thematic & targeted actions encompass:

For managers. 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.

For citizens. Promote capacity building to increase resilience to natural disasters of Mediterranean countries, including knowledge of historical events such as earthquakes, coastal slides, tsunami and coastal flooding.

For operators. Improve Mediterranean training centres and capabilities to carry out projects for safety in oil & gas and MREs offshore operations, including knowledge of environmental risks and new technologies.

For researchers. Train a new generation of marine technicians/scientists to conduct research on the protection of the marine cultural heritage.

Strategic Action/1	**Cross-discipline Programme on the human element @ Sea** to enhance the education and curricula of human resources via brain circulation
Indicative starting time	2022
Suggested timeframe	ttt

Proposed funding programmes and instrument	Joint effort by: EC, UfM, UNIMED, EMUNI, SEA-EU, IOC/UNESCO, in the framework of the UN-Decade of Ocean Science for Sustainable Development with the support of tailored platforms, e.g. BlueGeneration Project Job Portal
Tentative budget	€€€

Promotional Action/1	**BlueMed & IOC/UNESCO joint meeting on marine literacy**
Indicative starting time	2022
Proposed instrument	BlueMed CSA task and IOC/UNESCO Programme
Tentative budget	€

Promotional Action/2	**Launch a BlueMed Hackathon focused on skills' innovation**
Indicative starting time	March 2021
Proposed instrument	Joint BlueMed & DG-MARE event (e.g. back-to-back BlueInvest Med)
Tentative budget	€€

Promotional Action/3	**SEALINES BlueMed Start-up Action training series for young workers**
Indicative starting time	2021
Proposed instrument	EASME DG-MARE/Blue Skills Call & BlueGrowth Summer School
Tentative budget	€€

(PRIORITY 12)

STRENGTHEN SYNERGIES AMONG SCIENCE, INDUSTRY, POLICY MAKERS, AND SOCIETY

Achieving strong synergies between all Blue Economy Stakeholders in the Mediterranean is an important aspect of a sustainable blue economy in particular when considering the geo-political complexity of the Area. Stronger synergies will enhance knowledge transfer among knowledge sectors. Scientific outcomes would be incorporated by other sectors through actions' co-design, thus impacting in terms of economic development, jobs, and well-being of citizens. Continuous interaction among relevant stakeholders shall be enhanced and guaranteed, also in compliance with relevant Sustainable Development Goal.

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).

Support Maritime Spatial Planning and Integrated Coastal Zone Management through research on multi-level governance and management of multi-stakeholder processes, improving the dialogue with civil society, in a science to policy approach.

Take full consideration of long-lasting effects of historical human interventions on coastal systems including river diversions, damming, digging of canals, and construction of hard structures for coastal defense, landfills with toxic materials and spread of pollution through time.

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.

Enhance awareness at both civil and political levels of the degradation of the marine environment, which presents crucial security challenges in terms of disruption of national economies, displacement of people, degeneration of national identities and loss of lives.

Include citizens' science in monitoring and sampling strategies while increasing awareness on the biases intrinsically related to citizen's science, which is hindered for example beyond the visible horizon or in dark deep water.

Coordinated approach addressing coastal management and conservation of anthropogenic villages/ecosystems involving local communities.

Strategic Action/1	**The BlueMed citizens' science action** (*linking with P4-Strategic Action/2*)
Indicative starting time	2021
Suggested timeframe	t
Proposed funding programmes and instrument	Countries/local administration and UfM labelled project

Tentative budget	€

Strategic Action/2	**The BlueMed Platforms' Constellation (multi-level cross-stakeholders' hubs)**
Indicative starting time	2023
Suggested timeframe	tt
Proposed funding programmes and instrument	European Partnership – A climate neutral, sustainable and productive Blue Economy/Expert Groups + ESIF/S3 + ENI CBC-MED Capitalization
Tentative budget	€€

Promotional Action/1	**Showcasing the role of BlueMed Young Communication Ambassadors**
Indicative starting time	September 2020
Proposed instrument	BlueMed CSA workshop at ESOF Conference
Tentative budget	€

Promotional Action/2	**Blue Cafes** (*targeting citizens, linking with P11-Promotional Action/1*)
Indicative starting time	September 2020/May 2021
Proposed instrument	Joint BlueMed countries and relevant associations task, e.g. in the framework of the European Researchers' Night or the initiative *European Maritime Day in your country*
Tentative budget	€

(PRIORITY 13)

FROM TRADITIONAL MARITIME ECONOMY TO BLUE GROWTH ACTIVITIES

Clusters can facilitate the exchange of knowledge, communication and best-practices between stakeholders and potentially boost economic growth and rapid technological development in the Mediterranean region, enabling also the exchange of good practices between the two shores of the Mediterranean Sea and among different stakeholders. The availability of data is a major ingredient for the transition towards smart and responsible blue growth; innovative business approaches should be envisaged including circular economy to adapt to the blue bioeconomy and zero-waste economy.

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, biotechnologies, coastal ecological engineering, satellite data services, etc. through federation of actors of research/industry, increasing visibility, international representation.

Develop economic studies to identify the specialization of different areas and regional clusters and identify the most productive and sustainable activities.

Establish innovative methodologies to assess the impacts of different programmes and actions on the evolution of maritime sectors and economy.

Favour incubators and connect startups, investors, accelerators, entrepreneurs, corporate networks, universities for increasing innovative blue ecosystems.

Strategic Action/1	**Mediterranean Forum on Blue Innovation**
Indicative starting time	October 2021 (to meet the launch of Horizon Europe)
Suggested timeframe	ttt
Proposed funding programmes and instrument	Integrated EASME + SEMED + Countries actions.
Tentative budget	€€€

Strategic Action/2	**Exchange of staff' Pilot Programme between key and less developed marine and maritime players**
Indicative starting time	2022
Suggested timeframe	t (exchanges should be minimum a two-weeks period)
Proposed funding programmes and instrument	Alignment of Secondment Programmes at country level + MCSA/RISE + Private foundations´ support.
Tentative budget	€€

Promotional Action/1	**Match-making event to exploit the opportunities of the *BlueInvest* Platform** bringing together innovators to sit and talk on investment opportunities with innovators, the financial community and stakeholders of traditional maritime economy to boost the economic potential of the Mediterranean Sea while protecting its marine resources.
Indicative starting time	March 2021
Proposed instrument	BlueMed networking event with a "speed-dating" format, with the collaboration of the BlueMed Operational Network of Research Funders and the BlueInvest Platform
Tentative budget	€€

Promotional Action/2	**Test the transition on adaptation to climate change and sea-level rise in coastal areas, and long-term strategy re-design of coastal infrastructures** (*linking with P12 on Strengthen synergies*)
Indicative starting time	December 2020 (within the BlueMed CSA multi-thematic Conference)
Proposed instrument	Academy-Industry-Policy makers joint brainstorming event
Tentative budget	€

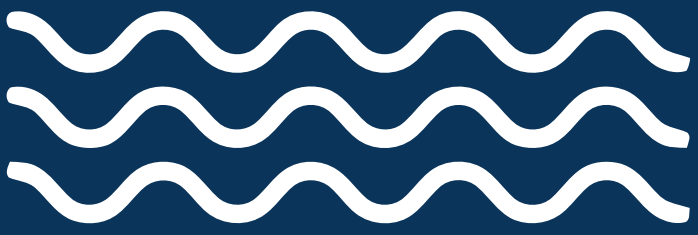
CATALOGUE OF INSTRUMENTS

1
Research & Innovation joint programmes

2
Connectivity/Alignment/ Supporting actions

3
Infrastructures

4
Capacity Building



This part of the Implementation Plan reviews the instruments that could be used to concretely work on the 13 priorities and reach the underlying goals. Given the wide scope of BlueMed, implementing the actions identified as priorities requires the use of a range of instruments. The choice of the most suitable tools for an action will have to take into account all relevant actors, the level of the resources required and the time needed to achieve the objectives set.

Some frameworks and financing programmes that can be used to support research and innovation for the blue economy in the Mediterranean already exist or are planned for the next future. Indeed, some of them have been proposed as possible instruments among others in addressing the planned Joint Strategic Actions presented in the previous section. There are, however, still gaps, and the implementation of certain strategic actions will certainly require new mechanisms to be put in place.

The work carried out in BlueMed[26] has shown that many institutional and non-institutional actors include in their strategies, whose scope can be international, national or regional, elements aiming at the development of a sustainable blue economy. While this can be seen as an opportunity, the search for efficiency requires **ensuring the proper alignment of the different actions and the coordination of the different stakeholders**.

The catalogue below lists potential instruments that could be used for transnational and alignment actions and assesses their interest for implementing BlueMed's priorities. The typology of actions is based on the work carried out by the CSA Oceans[27] in support of the Joint Programming Initiative (JPI) Oceans.

One of the characteristics of the Mediterranean area is the significant gaps in economic development and resources allocated to R&I between the Northern and Southern shores. Northern countries Members of the European Union benefit from the numerous tools and significant resources put in place by the European Commission to support research, innovation and economic

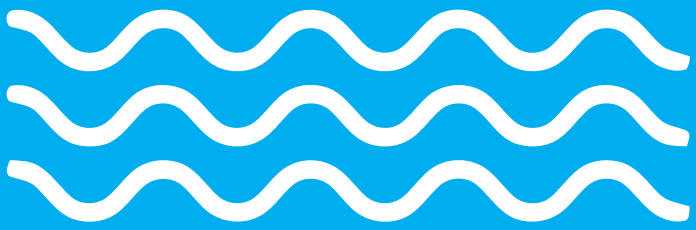
26 BlueMed CSA, Deliverable 2.6 - Marine and Maritime RTDI Strategies, available at: http://www.blue-med-initiative.eu/wp-content/uploads/2018/10/BLUEMED-CSA_D2.6-RI-Strategies_final.pdf
27 CSA Oceans, Deliverable 2.4 - Proposal for procedures for design and management of joint actions

development. Some of the cooperation instruments are accessible to non-European countries through targeted association agreements (e.g. Tunisia's association to Horizon 2020). However, the resources mobilised in this respect remain much lower than those committed in EU Member States.

The following list provides an overview of the main instruments available or that are most likely to be available in the time-frame relevant for the implementation of BlueMed priorities. While based on the analysis of present landscape, it acknowledges the transition phase between the two major EU 7-years R&I framework programmes as well as the forthcoming implementation phase of the UN-Decade of Ocean Science for Sustainable Development. This can bring new tools opening innovative opportunities while overcoming some actual ones.

1 Research & Innovation joint programmes

These are instruments with the capacity to launch calls for projects and to fund transnational collaborative research and innovation actions.



INSTRUMENT

Horizon 2020[28]/Horizon Europe[29], EU Research and Innovation programmes

For EU Member States and associated countries, these programmes are major and powerful tools for fostering R&I and developing transnational cooperation through collaborative projects involving public and private actors. Horizon 2020 (2014-2020) funds projects according to three priorities: Excellent science, Societal challenges and Industrial leadership.

The next programme Horizon Europe (2021-2027) will be based on 3 pillars: Excellent science, Global Challenges and European Industrial Competitiveness and Innovative Europe. Horizon Europe targets impacts that support the Political guidelines in the EC, especially a EU Green Deal and an Economy that works for People. Next to tools similar to those of Horizon 2020 (e.g. collaborative projects funded under 6 Clusters/Societal challenges), Horizon Europe will include new instruments currently under development: missions and partnerships.

Five mission areas have been identified. Among them, the mission "Healthy oceans, seas, coastal and inland waters" will address issues linked to BlueMed priorities.

Partnerships will be reserved for actions that are not covered by the other parts of Horizon Europe. Three types of partnerships are proposed:

- Co-programmed European Partnerships between the Commission and private and/or public partners, based on memoranda of understanding and/or contractual arrangements;

28 https://ec.europa.eu/programmes/horizon2020/en
29 https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en

- Co-funded European Partnerships, involving EU countries, with research funders and other public authorities at the core of the consortium. This type of partnership is similar to ERA-NETs Co-fund;

- Institutionalised European Partnerships where the EU participates in research and innovation funding programmes that are undertaken by a number of EU countries based on articles 185 or 187 of the Treaty on the Functioning of the European Union. Such long lasting partnership will be appropriate for the support of JPIs (see below) by the EC.

As part of Horizon 2020, the European Institute of Innovation (EIT) was created to increase Europe's ability to innovate by nurturing entrepreneurial talent and supporting new ideas. Through Knowledge and Innovation Communities (KICs), EIT supports the development of dynamic, long-term European partnerships among leading companies, research labs and higher education. For 2021-2027, a revised EIT Regulation and a Commission Decision on the Strategic Innovation Agenda for 2021-2027 will be proposed to the European Parliament and the Council.

Under the Environmental and Climate policies of the EU, the **LIFE programme** is a funding instrument which aims mainly at:

- Helping move towards a resource-efficient, low carbon and climate resilient economy, improve the quality of the environment and reverse biodiversity loss;

- Support better environmental and climate governance at all levels

EXAMPLE 1

ERA-NET COFUND[30]

Under Horizon 2020, ERA-NET (European Research Area Network) is a funding instrument designed to support public-public partnerships in the establishment of networking structures and coordination of joint activities. It focuses on transnational research and innovation and supports single joint calls mainly funded by the Member States partner of the ERA-NET. 27 ERA-NET proposals addressing each one thematic R&I area (e.g. Biodiversa: Consolidating the ERA on biodiversity and ecosystem services) have been selected in H2020. "This instrument has proven its capacity to significantly strengthen transnational cooperation by establishing lasting cooperation among countries and creating a critical mass of resources to tackle EU societal challenges. It has contributed to the coordination of national programmes and to a lesser extent to the alignment of national policies. The instrument has facilitated widening participation of lower performing countries"[31].

EIT Climate KIC is a knowledge innovation community established and funded by the European Institute of Innovation and Technology (EIT). It identify and support innovation that helps society mitigate and adapt to climate change by:

- Convening networks of expertise that bring together partners from business, academia, and the public and non-profit sectors
- identifying, sourcing and placing public and private funds that stimulate innovation
- runing a range of inspirational education programmes for students, post graduates and professionals.
- Catalysing innovation through the support of initiatives like ideas platform, incubator programmes, accelerators

30 https://ec.europa.eu/programmes/horizon2020/en/h2020-section/era-net
31 European Commission, Analysis of ERA-NET Cofund actions under Horizon 2020

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

The framework laid down for Horizon Europe and the priorities identified by the European Commission for the next years in the area of environment and economy suggest that some of BlueMed's priorities can be supported by future European funding programmes. A challenge will be to **reduce the gaps between Northern and Southern Mediterranean countries**. In this respect, the opportunity to create a dedicated partnership to associate more closely the countries on the southern and eastern shores of the Mediterranean should be envisaged. Such partnership would require a strong support of the government of participating countries from both shores and can build on relevant projects like the ERANET-MED.

INSTRUMENT

Joint Programming Initiatives (JPIs)[32]

The aim of the joint programming process is to pool national research efforts in order to make better use of Europe's research and development resources and tackle common European challenges more effectively. This is based on the observation that even if European national research programmes are at a high level, they cannot tackle some of today's major societal challenges alone.

Joint Programming Initiatives are developed in a structured and strategic process where EU countries agree on a voluntary basis on common visions and Strategic Research Agendas (SRA) to address major societal challenges.

EXAMPLE 1

JPI OCEANS[33]

JPI Oceans is an intergovernmental platform that strives to increase the impact of national investments in marine and maritime research and innovation. It contributes to aligning national priorities and implement joint actions including the launch of joint calls for transnational research and innovation projects and sharing of research infrastructures. JPI Oceans has 20 member countries including two non-Member States of the EU (Norway and Turkey).

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

The study of a JPI like partnership between Mediterranean countries focused on Blue Economy related Research and Innovation and in coordination with JPI Oceans could be an opportunity to enhance and align efforts to implement BlueMed priorities actions.

32 https://ec.europa.eu/programmes/horizon2020/en/h2020-section/joint-programming-initiatives
33 www.jpi-oceans.eu

INSTRUMENT

Article 185 initiatives

Article 185 of the Treaty on the Functioning of the European Union (TFEU) allows the EU to participate in research programmes jointly undertaken by several EU countries with the possibility to associate non-European countries. The criteria to identify potential article 185 initiatives are set out in the Horizon 2020 programme:

- a clear definition of the objective to be pursued;
- a clear and firm commitment from the participating Member States;
- indicative financial commitments of the participating countries, including prior commitments to align national and/or regional investments for transnational research and innovation and, where appropriate, to pool resources;
- its relevance to the EU policy objectives and the added value of the action at EU level;
- the critical mass, with regard to the size and the number of programmes involved, the similarity or complementarity of activities and the share of relevant research they cover;
- a well-prepared joint programme and priorities;
- a well-organised implementation structure.

EXAMPLE 1

PRIMA[34]

(Partnership for Research and Innovation in the Mediterranean Area, 2018–2028) in an ongoing Art 185 aiming at developing innovative and sustainable solutions in agriculture, food production and water provision, encouraging application by communities, enterprises and citizens.

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

Covering the areas of agriculture and freshwater resources in the Mediterranean, PRIMA does not cover marine issues. This framework can only marginally be used to implement the priorities of BlueMed. In this way, the two initiatives can facilitate the alignment of regional priorities with national and international ones.

34 http://prima-med.org/

INSTRUMENT

INTERREG[35]

European Territorial Cooperation (ETC), better known as Interreg, is one of the two goals of cohesion policy and provides a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States. The overarching objective of European Territorial Cooperation (ETC) is to promote a harmonious economic, social and territorial development of the Union as a whole. Interreg is built around three strands of cooperation: cross-border (Interreg A), transnational (Interreg B) and interregional (Interreg C). The on-going programme is INTERREG V (2014-2020). The advantage of Interreg programmes is to involve the (administrative) regions. INTERREG primarily concerns the regions of the EU Member States. Some programmes are, however, marginally open to partners from countries neighbouring the EU.

EXAMPLE 1

INTERREG MED PROGRAMME 2014-2020[36]

The Interreg MED Programme 2014-2020 is the transnational European Cooperation Programme for the Mediterranean area. It gathers 13 European countries from the Northern shore of the Mediterranean. The main objective of the Interreg MED Programme is to promote sustainable growth in the Mediterranean area by fostering innovative concepts and practices and a reasonable use of resources. The total budget for the 2014-2020 period amounts to 265 Mio €, composed of 224 Mio € ERDF (European Regional Development Fund), 9 Mio IPA (Instrument of Pre-Accession) and national co-funding.

35 https://ec.europa.eu/regional_policy/fr/policy/cooperation/european-territorial/
36https://interreg-med.eu

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

Although not targeting research and innovation, INTERREG programmes finance transnational innovative projects in support of economic and territorial development. They could therefore be appropriate for the funding of some BlueMed actions, including structuring.

INSTRUMENT

European and Maritime Fisheries Fund[37]

The EMFF is the fund for the EU's maritime and fisheries policies for 2014-2020. It is one of the five European Structural and Investment Funds (ESIF) which seek to promote a growth and job based recovery in Europe. As an instrument for supporting the European Common Fishery Policy, EMFF:

- helps fishermen in the transition to sustainable fishing
- supports coastal communities in diversifying their economies
- finances projects that create new jobs and improve quality of life along European coasts
- supports sustainable aquaculture developments

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

For European MSs, the EMFF is a privileged tool for accompanying the fishery and aquaculture sectors toward sustainable practices and then support the implementation of the **BlueMed priority goal "Support solutions for sustainable food production and consumption"**.

37 https://ec.europa.eu/fisheries/cfp/emff_en

INSTRUMENT

European Neighbourhood Policy[38]

The European Neighbourhood Policy (ENP) governs the EU's relations with 16 of the EU's closest Eastern and Southern Neighbours. To the South: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine*, Syria and Tunisia and to the East: Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. Stabilisation of the region, in political, economic, and security related terms, are at the heart of the ENP. Joint priorities for cooperation focused on good governance, human rights, and security. This includes also economic development for stabilisation.

EXAMPLE 1

ENI CBC "MEDITERRANEAN SEA BASIN PROGRAMME"[39]

The 2014-2020 ENI CBC "Mediterranean Sea Basin Programme" is the largest Cross-Border Cooperation (CBC) initiative implemented by the EU under the European Neighbourhood Instrument (ENI). The Programme brings together the coastal territories of 14 countries in view of fostering fair, equitable development on both sides of the Mediterranean. Through calls for proposals, ENI CBC Med finances cooperation projects for a more competitive, innovative, inclusive and sustainable Mediterranean area.

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

Although ENP only deals marginally with Research and Innovation, this instrument could be used to support actions more related to blue economy, provided the promotion of the implementation plan towards Managing Authorities.

38 https://ec.europa.eu/neighbourhood-enlargement/neighbourhood/european-neighbourhood-policy_en
39 www.enpicbcmed.eu

INSTRUMENT

Private foundations/NGOs

Created within large private companies or as NGOs, foundations are committed – sometimes with very significant resources – to supporting well-defined actions in line with their missions and which may involve public or private actors. Many foundations have stated objectives of supporting research and innovation, environmental preservation, sustainable development, capacity building and education.

EXAMPLE 1
ONE OCEAN FOUNDATION[40]

One Ocean Foundation develops specific projects that help safeguard marine life. Recently it has launched a "Business for Ocean Sustainability" research project. Produced with the support of SDA Bocconi, McKinsey & Company and CSIC, the project – focusing for this first edition on the Mediterranean Sea, but with cross-border potential – examines the current relationship between ocean sustainability and the economy from a new perspective. More than 220 international companies, start-ups, associations and NGOs are involved, spanning 13 industry sectors.

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

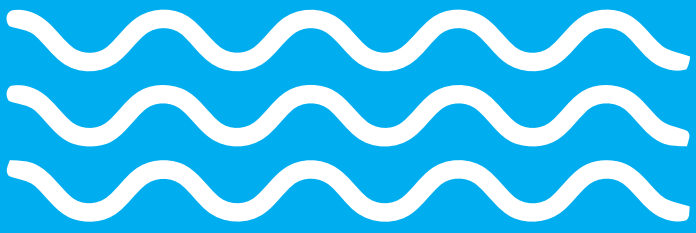
This way of financing R&I actions proposed by BlueMed could be further explored by **identifying foundations whose missions fall within the scope of the BlueMed Initiative** and engage them in the funders' network.

40 https://www.1ocean.org/

2

Connectivity/ Alignment/ Supporting actions

Different types of instruments that aim at fostering alignment, information exchange, community building and coordination among a broad diversity of stakeholders.



INSTRUMENT

Networking tools

As a general principle, networking tools are understood as networks where stakeholders can share information and coordinate their actions. Such tools intend to contribute to the development of an interactive community of a specific topic/ area and ultimately to promote dialogue and opportunities for operational collaboration among stakeholders. There are a multitude of networking tools linked to blue economy in the Mediterranean.

Big events and exhibitions/fairs/conferences (e.g. Ecomondo, Euromaritime) are also powerful tools for sharing new ideas and promoting sustainable innovations. To develop the investment in the private sector and supporting start-ups and SMEs, programmes, platforms and events which organize meetings between entrepreneurs, investors, researchers, corporates and innovation stakeholders are essential (e.g. BlueInvest[41], COST[42]).

EXAMPLE 1

THE MEDITERRANEAN BLUE ECONOMY STAKEHOLDER PLATFORM (MEDBESP)[43]

The MedBESP – former Virtual Knowledge Center – is a regional networking platform for sharing knowledge and for supporting the development of the blue economy. MedBESP is an operational tool for a service goal developed by the European Commission – DG Maritime Affairs and Fisheries and currently managed by the Union for the Mediterranean (UfM). The ultimate objective is to contribute to the development of an interactive Blue Economy Community.

41 https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1451
42 https://www.cost.eu/
43 http://www.medblueconomyplatform.org/vkc

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

In the Mediterranean, there are various institutional organisations of this nature, in diverse areas (UNEP/MAP, GFCM, CIESM, CRPM...), representing as much networking capacities on which to build on to promote priority sharing and operational efficiency for the BlueMed Implementation Plan. Networking opportunities and tools also exist at the non-institutional level (e.g. MedPAN on Marine Protected Areas).

INSTRUMENT

Sea basin regional strategies[44]

In accordance with the European maritime policy, macro-regional sea basin initiatives are being implemented in the seas bordering Europe. They promote growth and development strategies that exploit the strengths and address the weaknesses of each large sea region. These initiatives do not launch their own calls for projects, but rather act as mechanisms for assisting the setting up of cooperative projects in the areas identified as priorities. They involve EU Member States but also neighbouring countries. The Mediterranean is concerned by EUSAIR[45] for the Adriatic-Ionian region and WestMED[46] for the Western Mediterranean.

EXAMPLE 1
EUSAIR'S 4 PILLARS

- Blue Growth (Blue technologies, Fisheries and aquaculture, Maritime and marine governance and services)
- Connecting the Region (transports maritimes et terrestres, réseaux d'énergie)
- Environmental Quality (the marine environment and transnational terrestrial habitats and biodiversity)
- Sustainable Tourism (Diversified tourism offer, Sustainable and responsible tourism management)

44 https://ec.europa.eu/maritimeaffairs/policy/sea_basins_en
45 www.adriatic-ionian.eu
46 www.WestMED-initiative.eu

EXAMPLE 2

WESTMED'S GOALS

- Safer and more secure maritime space
- Resilient and smart blue economy
- Better governance of the sea

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

These sea basin strategies are focused on the coordination of marine policies among countries based on national hubs. Both have priorities related to the blue economy innovation and sustainable development. Ensuring a good coordination of BlueMed with these key players is crucial for effective communication and the promotion of coherent priorities.

INSTRUMENT

Smart Specialisation Strategy[47]

The European Commission's Cohesion Policy aims to reduce differences and ensure a balanced development between regions, and to ensure growth across Europe. Structural Funds are among its main tools. Its efficient use and management has been a crucial factor for many regions in Europe to overcome the economic crisis and strengthen the recovery in a sustainable way. For this reason, over the programming period 2014-2020, developing a Research and Innovation strategy for Smart Specialisation Strategy (RIS3) has been a prerequisite in order to receive funding from the European Regional Development Fund (ERDF). The Smart Specialisation Platform (S3P) assists Member States and regions to develop, implement and review their RIS3 Smart Specialisation Strategies. These include a focus on identifying niche areas of competitive strength, solving major societal challenges, bringing in a demand-driven dimension, fostering innovation partnerships emphasising greater coordination between different societal stakeholders and aligning resources and strategies between private and public actors from different governance levels.

EXAMPLE 1
MARITIME CLUSTERS

Maritime clusters are effective tools to support local stakeholders active in the Blue Economy to identify areas for further development and ensure sustainable growth and jobs. They do so by supporting innovative products and services, internationalisation of micro, small and medium enterprises, dissemination of new knowledge and skills and ultimately integration of sectoral policies at local, European and national levels.

47 https://ec.europa.eu/jrc/en/research-topic/smart-specialisation

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

Maritime Clusters have therefore been growingly acknowledged as essential booster for innovation and diversification of the Blue Economy and therefore they should play a major role in the development of blue companies and start-ups. Addressing Regions to update their Smart Specialization Strategies according to the BlueMed Implementation Plan, where relevant, is a concrete alignment action to be promoted.

INSTRUMENT

Foresight

Foresight studies shed light on the future. By analysing trends and identifying risks with the support of a broad expertise, scenarios for the next decades can be designed to elaborate policies, to guide investments and to build a shared view of possible trajectories for the society.

EXAMPLE 1
MED 2050[48], BUILDING THE MEDITERRANEAN FUTURE TOGETHER

In 2017, Plan Bleu (a Regional Activity Center of UNEP/MAP), was mandated by the Contracting Parties of the Barcelona Convention to launch a new foresight study on the environment and development in the Mediterranean by 2050. MED 2050 is an ambitious foresight exercise designed as an original science-policy interface, aiming at mobilizing decision makers and stakeholders from the North and South of the Mediterranean, going beyond geographical and institutional borders. Its goal: confront several possible visions of the Mediterranean future by 2050 (with an intermediate step at 2030) and co-construct solid and grounded transition paths towards common goals.

48 http://planbleu.org/fr/activites/med-2050-une-initiative-modulaire

EXAMPLE 2

MEDECC[49], SCIENTIFIC ASSESSMENT OF CLIMATE AND ENVIRONMENTAL CHANGES IMPACTS IN THE MEDITERRANEAN BASIN

The network of Mediterranean Experts on Climate and Environmental Change (MedECC) was created in 2015. MedECC is an independent international scientific expert network to support decision-makers and to educate/inform the general public on the basis of available scientific knowledge and on-going research. MedECC includes more than 600 scientists from 35 countries.

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

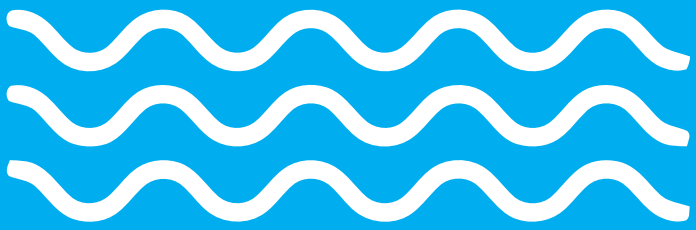
The priorities of the BlueMed SRIA and the actions proposed are the result of consultation with a wide range of stakeholders. The priorities that emerge can therefore feed into the prospective work undertaken on the region, in particular MED 2050. Conversely, the results of forward-looking reflections could usefully contribute to consolidating and updating the SRIA BlueMed.

49 www.medecc.org

3

Infrastructures

Establishing and maintaining appropriate infrastructures to support marine and environmental research and innovation is a challenge. At the European level, a significant effort was made in the various R&I Framework Programmes to develop these costly tools and promote trans-national access.



HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

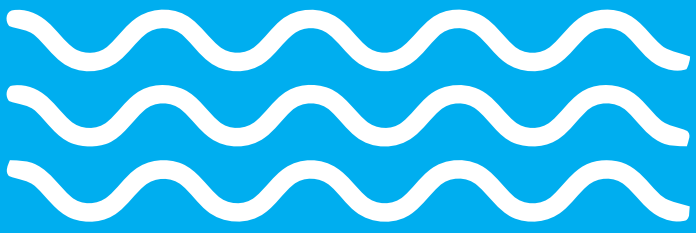
A number of existing infrastructures partly meet the needs identified in BlueMed. Taking into account the specificities of the Mediterranean region and above all the significant imbalance between the countries of the North and the South, important gaps remain to be filled. The priorities in this area are described in the BlueMed deliverable "BlueMed Research Infrastructures Roadmap"[50]. This roadmap aims at giving an overview of the actions to be carried out at the Mediterranean level to further support the scientific needs of research and innovation communities and it results from a long bottom-up process carried out throughout the whole CSA.

50 BlueMed CSA, Research Infrastructure Roadmap, Deliverable 3.4

4

Capacity building

In a knowledge-based economy, increasing people knowledge in relation with the surrounding environment not only brings to the achievement of new research results but also to the enhancement of innovation potential and creation of new jobs. International collaboration has been directly linked to high-quality science and innovation.



INSTRUMENT

Students and scientific staff exchange

International mobility has indeed a direct and beneficial impact especially for students and young scientists on career development, cultural maturity and language skills. In this regard, Europe has set up specific instruments (Marie Sk odowska-Curie Actions, ERASMUS+) that have proven to be successful.

EXAMPLE 1
ERASMUS+ (2014–2020)

Erasmus+[1] is the EU programme for education, training, youth and sport for the period 2014-2020. Erasmus+ funds academic and youth mobility and cooperation projects that involve partners from "Programme Countries" and "Partner Countries" throughout the world. Partner countries are located all over the world and include the countries of the Southern Mediterranean: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia.

INSTRUMENT

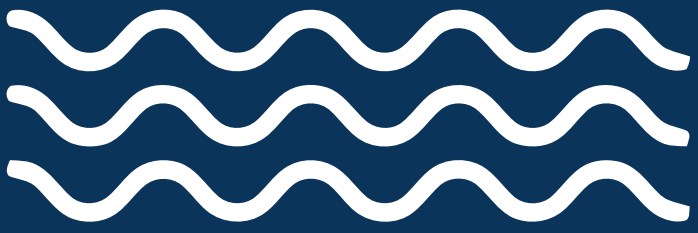
Vocational Education and Training (VET)

In almost all sectors of the Blue Economy the availability of appropriate vocational training courses is a necessary condition for the creations of jobs. Attention should therefore be paid to the provision of short training programmes that develop skills meeting the needs of employers and which are in agreement with the national/regional strategies and investments.

HOW CAN IT BE APPLIED TO BLUEMED CONTEXT

The **development of blue skills is crucial to provide the conditions for a dynamic blue economy**. Although certain initiatives targeting the Mediterranean region (e.g. Mediterranean Universities Union – UniMed, the Euro-Mediterranean University – EMUNI, the European University of the Seas – SEA-EU, the Advanced Master/Summer School in Sustainable Blue Growth), there is a need to strengthen these capacity building tools in order to reduce gaps among countries.

MONITORING AND KEY PERFORMANCE INDICATORS (KPIs)



What will BlueMed implement? The priority goals. How? Through a set of proposed instruments. These two aspects have been addressed in the previous sections. But how the actions undertaken will be monitored and their impact evaluated? A tool-suite addressing macro-descriptors/indicators covering processes and progress is presented in this section.

To cope with the ambition of the BlueMed Initiative it is essential to develop a methodology and suitable tools to monitor the implementation process itself against the evolution of the Blue Growth in the Mediterranean, in relation with the typologies of activities promoted in the Implementation Plan, which will produce different effects in different time scales:

- the **Strategic Joint Actions**: larger actions and initiatives occurring on a longer time scale. The preparation of their implementation will require more time and they are expected to induce wider changes in the Mediterranean region and will have consequent benefits for countries who will undertake them. However, the changes they will occur may be less tangible and harder to measure;

- the **Promotional Joint Actions**: specific and punctual actions, possibly implemented with the support of BlueMed CSA within the project's lifetime. There are expected to have visible and tangible results quite soon;

In the specific case of BlueMed, and according to the very dense available literature related to assessing the results and impacts of a project/an action, it seems relevant to use different mechanisms and therefore different types of indicators to measure the results and then the impacts of the planned joint actions presented in the Implementation Plan.

In the same way as Promotional Joint Actions and Strategic Joint Actions will occur on different time scales, two assessment mechanisms can occur at different stages: the **monitoring process (1)** and the **impact evaluation process (2)**.

1) **Monitoring** can be performed in a continuous manner that is developed periodically (for example one time per year) during the whole period of the implementation of BlueMed joint planned actions. Such monitoring activity will enable to follow the implementation of activities and assess whether they are conducted according to what is planned in the IP and if there is a need to adapt the initial postulate. It measures the interventions in itself and the methods used by the different stakeholders to act. Two types of indicators will be used for this monitoring process:

A] Indicators to monitor the implementation of Strategic planned Joint Actions: they will provide information on the way Strategic planned Joint Actions are undertaken and will measure the resources and efforts used for their implementation (including the different levels of cooperation).

Coordination/alignment/efficient dialogue with other relevant strategic research initiatives
Effective involvement of academics, industry, regulatory agencies and policy makers
Total number of calls successfully launched
Number and share of calls supported by EC Cofunds
Number and share of international calls (participation from countries beyond EU)
Amount and share of national funds allocated to calls
Total strategic joint actions launched
Number of strategic joint actions funded in the framework of Horizon Europe
Number of strategic joint actions/cooperation with Interreg projects
Number of strategic joint actions/cooperation launched with regional initiatives
Number of strategic joint actions/cooperation involving private sector
Total number of countries involved in the launch of strategic joint actions
Number of new political agreements on sharing R&I infrastructures among Med countries
Amount of joint budgets/projects for shared use of R&I infrastructures

Number of new established Open Access policies
Number of joint centres of excellence/training centres created in the framework of BlueMed
Number of impact/feasibility studies led before launching major activities/ initiatives
Number of new clusters for specific marine economic activities
Extent of member states indicating that BlueMed Initiative influenced the national focus of research programmes (upon the development of a shared survey)
Integration of BlueMed SRIA in national policies and strategies/programmes
Number of stakeholders using the BlueMed website
Identifiable coordination/alignment of strategic research programmes at different scales

Table 3
Examples of indicators to monitor the implementation of strategic planned joint actions

B] Indicators to monitor the implementation of Promotional Joint Actions: they will assess tangible and direct results produced by promotional actions presented in the document, as they are expected to be implemented quickly, possibly within the project's lifetime and will produce easily measurable and highly visible results. Monitoring the implementation of Promotional Joint Actions of the IP can start as soon as first promotional actions are launched.

Number of conferences/workshops organized in BlueMed framework
Number of events and meetings involving BlueMed community and civil society
Total number of people who attended conferences/workshops/events organized in BlueMed framework
Number of trainings taking place (including remote e-trainings) organized in the BlueMed framework

Number of people who attended the trainings organized in the framework of BlueMed
Number of events bringing together different blue economy stakeholders organized in the framework of BlueMed
Production of communication/dissemination materials (manuals, leaflets, brochures, websites, mobile applications)
Number of scaled up BlueMed Start-up Actions and other BlueMed related activities
Number of conferences/meetings where BlueMed Ambassadors intervened
Number of journalistic articles mentioning BlueMed activities
Launch of new pilot actions in the framework of BlueMed
Total amount of funding used for promotional joint activities

Table 4
Examples of indicators to monitor the implementation of Promotional Joint Actions

2) An **impact evaluation** refers to the assessment of a project or an initiative in the long term (after an initial period of 3 to 5 years). Indeed, the term "impact" covers a wide range of changes, positive or negative, occurring over a medium-to-long period of time, produced by an intervention, directly or indirectly, intended or unintended[51]. In the framework of BlueMed, all the planned Joint Actions presented in the IP (promotional and strategic) are expected to produce benefits for the Mediterranean Sea on a medium and long term.

Therefore, **indicators developed for BlueMed impact evaluation** will assess wide and long-term effects of both the Promotional and Strategic Joint Actions planned in relation with BlueMed SRIA priorities. The changes expected to be induced by the whole BlueMed Initiative may have consequences on the Mediterranean environment, ecosystems, economy, policy frameworks and society.

Examples of impacts: on EU and national policies, alignment of national research programmes, impact on environmental protection policies, collaboration between BlueMed community and other relevant major

51 (OECD) 2010, Glossary of Evaluation and Results Based Management (RBM) Terms, OECD (2010)

initiatives, impact on specific economic sectors, emergence of new cooperation networks, changes of mentalities regarding a specific topic, sustainable jobs' creation (thus employment)...
Exploiting available data and literature, these indicators have been tailor maiden for the BlueMed SRIA priorities presented in this document.

It is important to note that this category of indicators focuses on desirable wide change occurring in the Mediterranean, which can be not very much tangible at first sight. In addition, it seems important to add that all transformative changes occurring in the Mediterranean and maritime environment cannot automatically and directly be linked to BlueMed, but still, the implementation of proposed activities in the IP is expected to generate added value to the region and measurable impact. **The BlueMed impact evaluation's indicators are presented in the following table and more details on the way to use them are presented in the Annex 2.**

 **P1**	Surface of coastal and marine protected areas in km2 Surface of marine mammal protected areas in km2 Numbre of patents in the field of climate change mitigation tchnology development related to plastics recycling Number of visitor on BLUEMED Pilot action website page dedicated to the Pilot Action on a Healthy Plastic-free Mediterranean Sea Concentration of key harmful contaminants measured in the relevant matrix (biota, sediment, seawater) Trens in the amount of litter washed ashore and/or deposited coastlines Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximun regulatory levels in commonly cosumed seafood Number of new regulations on pollution limitation/prevention/control
 **P2**	Fisheries technology development Economic value of fisheries, as a percentage of GDP Fishery fleet, total number of vessels Fisheries capture of marine fishes in tonnes Economic value of aquaculture, as a percentage of GDP Aquaculture production, in tonnes Proportion of fish stock within safe biological limits Number of fish threatened species Number of fishers ans fish farmes
 **P3**	Total number of patents in the field of climate change mitigation technology development Trend in abundance, temporal occurrence, and spatial distribution of non-indigenus species, particularly invasive, non-indigenous species, notably risk areas Number of new regulations in the field of climate change mitigation and adaptation
 **P4**	Number of non-EU scientist who have access to European marine RIs

 P5	Employment in tourism Proportion of bathing sites awarded the Blue Flag out of total coastal bathing sites
 P6	Length of coastline subject to physical disturbance due to the influence of man-made structures
 P7	Number of patents in the field of climate change mitigation technologies related to maritime transportation Vessls´operational pollution, in million tones Annual mean of fuel consumption by ships of over 5000G Annual mean concentration of fine particulate matter of less than 2.5 microns of diameter (PM2.5) in coastal urban areas
 P8	Number of firms active in biotechnology
 P9	R&D public investments for renewable energy Number of national renewable energy incentives Share of fossil fuels in total primary energy sypply Total renewable capacity energy, in MW
 P10	Number of scientific publications in the field of marine science in open access
 P11	Share of population with tertiary education Number of universities delivering trainings in marine sciences Total number of Master degrees in marine sciences Total number of Master degrees in marine sciences Share of population holding a PhD marine sciences Total number of vocational trainings in links with technical blue skills development
 P12	Number of Blue Living Labs and other innovation ecosystems linking science and industry
 P13	[Not available at this stage]

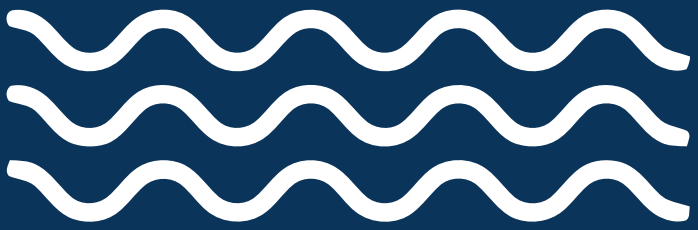
Table 5
Non-exclusive list of indicators proposed for impact evaluation of the 13 BlueMed Priorities

Leading such a monitoring and impact evaluation requires a certain amount of efforts and resources. In order to be as efficient as possible, to optimize the remaining time and limit additional financial and human resources related to this exercise, it is suggested that:

- Actions leaders/committers and main stakeholders who will implement Strategic Joint Actions could be directly in charge of the monitoring and impact evaluation exercise for the Strategic Joint Action(s) they will be supervising (indicators in the table 3 and indicators in the table 5).

- CSA members could be in charge of monitoring the implementation of Promotional Joint Actions (indicators in table 4) until the end of the CSA.

METHODOLOGY TO DEVELOP THE IMPLEMENTATION PLAN AND TO REACH THE 13 PRIORITIES FROM THE SRIA



BlueMed Initiative set-up and launch (2014-2017)

The present Implementation Plan is a distillation of a long process originated with political commitments initiated in 2014: **the BlueMed Initiative, set up in May 2014** in the framework of the European Strategy on Blue Growth, is a political initiative aiming at advancing a shared vision for a more healthy, productive, resilient, better known and valued Mediterranean Sea, promoting the citizens' social well-being and prosperity, now and for future generations, and boosting economic growth and jobs.

Nine European countries (Cyprus, Croatia, France, Greece, Italy, Malta, Portugal, Slovenia and Spain) and Romania, with the support of the European Commission, signed in **October 2015** the Venice declaration on Mediterranean Sea Cooperation, **launching a Strategic Research Marine and Maritime Research and Innovation Agenda for Blue Growth, the BlueMed SRIA**[52].

In **November 2015**, the **Union for the Mediterranean (UfM) endorsed the BlueMed agenda** with the Declaration on the Blue Economy, inviting non-EU countries to join the BlueMed Initiative.

A first important recognition of the collaborative work was the launch of a set of BlueMed dedicated calls for proposals under the EU-H2020 2016-2017 and DG-MARE Work Programmes (Blue Labs, Blue Careers and Blue Technologies) mobilizing an amount of about 50M€, including the BG-13-2016 Support to the BlueMed Initiative: Coordination of marine and maritime research and innovation activities in the Mediterranean under which the project *BlueMed Coordination and Support Action* was granted.

An important milestone was then reached in **May 2017, when all the UfM and EU member states endorsed the Valletta Declaration** under the auspices of the Maltese Presidency of the Council of the European Union with the support of the European Commission. The Valletta Declaration on "Strengthening Euro-Mediterranean Cooperation through Research and Innovation", welcomed the BlueMed initiative as a means to promote a healthy, productive and resilient Mediterranean Sea and stress the importance of structuring Euro-Mediterranean cooperation in marine and maritime sectors to encompass a broad range of objectives comprising the creation of new, blue jobs and social well-being while also being mindful of sustainable development and the preservation of the environment in the Mediterranean area. Following the signature of the Valletta declaration, the BlueMed Group of Senior Officials BlueMed Working Group was established.

52 www.bluemed-initiative.eu/wp-content/uploads/2016/12/Bluemed-SRIA_A4.pdf

BlueMed SRIA consultation and update process (2018)

After the launch of the BlueMed SRIA in October 2015, the document was updated twice, during 2017 (www.bluemed-initiative.eu/wp-content/uploads/2016/12/Bluemed-SRIA_A4.pdf) and 2018 (www.bluemed-initiative.eu/wp-content/uploads/2016/12/Bluemed-SRIA_A4.pdf), firstly by the Consortium of 11 partners from 9 European countries involved in the BlueMed Coordination and Support Action (CSA) and secondly with a revision of the SRIA also by the non-European countries being part of the Mediterranean Basin.

That updated version of the BlueMed SRIA was fully endorsed at the time by the Euro-Mediterranean Group of Senior Officials (GSO) BlueMed Working Group (WG), which is the steering body of the BlueMed Initiative and is co-chaired by DG Research and Innovation of the European Commission and the current co-chair of the Union for the Mediterranean, the country of Jordan. The GSO BlueMed Working Group is also supported by the Secretariat of the Union for the Mediterranean (UfMS).

The success in the process of updating the BlueMed SRIA and the importance of all inputs received through the process from many stakeholders gave birth to a new very extensive SRIA with 13 key challenges at Mediterranean level divided in 4 pillars and deployed in 34 goals and a large number of actions. In that sense, a distillation exercise had to be done to prioritise on some of these challenges and actions highlighted in the SRIA and focus on the joint implementation of a set of actions addressing the most pressing aspects agreed by European and non-European stakeholders.

It was during the Euro-Med GSO BlueMed WG meeting organised in the framework of the BlueMed Week held in October 2018 at UfM Secretariat in Barcelona that, upon the proposal from Italy, the European Commission and the whole GSO BlueMed WG agreed on the idea to launch a pilot action on Healthy Plastic-free Mediterranean free to be jointly developed.

BlueMed SRIA prioritisation process (2019)

The BlueMed CSA jointly designed a methodology to select in a coordinated and standardised way the most pressing priorities within the BlueMed SRIA. The main challenge about the process was to design a method rigid enough to allow comparable results but also flexible enough to allow countries to share their national perspective, including on social, geographical or economic aspects.

The process was designed to allow, before comparing results at international level among countries as explained below in the 'Methodology', a certain degree of flexibility to the countries to formulate their priorities internally according to the most suitable mechanism for their own country, e.g. through a stakeholders´ consultation, inter-ministerial agreement, agreement among their BlueMed National Pivots, or even a mix of them all.

Methodology

AT NATIONAL LEVEL

· Step 1

All countries **scored all SRIA goals from 1 to 10** based on 4 criteria (scientific, economic, technology and policy impact at Mediterranean level) and they classified goals between short and long term.

· Step 2

All countries generated a top10 list of priority goals based on step 1 and following 10 criteria agreed at CSA level:

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 was requested in their opinion to achieve those goals.

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

· 14 countries gave feedback on steps 1 and 2 (Croatia, Cyprus, Egypt, France, Italy, Spain, Greece, Malta, Jordan, Morocco, Portugal, Slovenia, Tunisia and Turkey);

· The BlueMed CSA went through the analysis of the data and crossed results in 2019 with quite positive conclusions:

Many countries had a high degree of coincidence on their selection of priorities;

Some countries like France or Italy interpreted differently the prioritisation exercise enriching the reflexion process, i.e. by aligning with other relevant initiatives such as WestMED and clustering priorities;

Non-EU countries gave a very detailed and thorough feedback.

AT INTERNATIONAL LEVEL

· Step 3

National exercises and a comprehensive matrix of results were distributed and discussed in a dedicated meeting in March 2019 by the BlueMed CSA Steering Committee jointly with the BlueMed Platforms' Coordinators;

· The priorities proposed, grouped in 'thematic' and 'cross-cutting' , were the most chosen ones by countries and are indicated as 'primary' in the tables below. A 'secondary' group of priorities, whose rating was just below the threshold, emerging as relevant from the technical discussions, was also added. Following the clustering approach, relevant SRIA goals highly related to the selected ones were equally highlighted. A strong emphasis on the across-pillar value was also given by associating together actions belonging to different sectors.

· Step 4

A final set of 13 priorities was presented to the GSO BlueMed Working Group for their analysis and endorsement in April 2019.

Upon GSO BlueMed WG´s endorsement, the BlueMed CSA started to reflect on how to bring the BlueMed priorities into actions and activities to be implemented, which would be the core part of the present BlueMed Implementation Plan, integrating the developments of the Pilot action on "Healthy Plastic-free Mediterranean free".

From BlueMed Priorities to Actions (2019-2020)

The following step towards the drafting of the BlueMed Implementation Plan was to propose a new methodology to feed the 13 BlueMed priorities with Actions and Activities to be implemented by the BlueMed community in the upcoming years.

The aim of the taskforce composed by the Coordinators and Work Package leaders of the BlueMed CSA jointly with the BlueMed Platform Coordinators

was to propose a process as participatory and inclusive as possible, giving all stakeholders in all Mediterranean countries the chance to **co-design actions and activities** under each priority.

In order to encourage Med countries to take ownership of the process and the challenges to address, a list of co-champion countries responsible for each priority was proposed, always pairing a European and non-European country in order to maximize the use and scope of international instruments allowing the implementation of actions and activities.

In some cases, countries proactively expressed a particular interest in supporting the work on one given priority, and were involved in the works.

BlueMed Priority	Co-Champion countries	Supporting country
Understanding Pollution Impacts, Mitigation, and Remediation in the Mediterranean Sea	Italy - Tunisia	
Support solutions for sustainable food production and consumption	Spain - Egypt	Italy
Preparing to climate change and define adaptation/mitigation measures	Greece - Morocco	
Towards an observing system of systems	France - Algeria	Malta
Linking tourism, tourists and environment	Cyprus - Tunisia	Slovenia
Effective maritime spatial planning in the Mediterranean	Italy - Turkey	Spain Egypt
Greening vessels, facilities and services	Italy - Turkey	Egypt
Exploring the potential of blue-biotech	Italy - Tunisia	Egypt
Promote the role of Marine Renewable Energies (MRE) in the energy transition phase	France - Turkey	
Open data, open science, open innovation	France - Turkey	Malta Spain
Building capacity, blue skills and blue professionals	Greece - Egypt	Italy
Strengthen synergies among science, industry, policy-makers and society	Malta - Jordan	
From traditional maritime economy to blue growth activities	Croatia - Israel	Spain France

One of the challenges of this exercise was to get comparable information and use a common template that would allow a proper analysis of the data and countries´ feedback.

For that purpose, a "Fiche" template was drafted based on the following conceptual outline of the Implementation Plan:

Part 1 - From vision to Actions	→	**Setting the scene:** The SRIA and the prioritization of actions
Part 2 - Mapping and discussing implementation options and potentials	→	**How the SRIA could be deployed at regional / sub-regional and sectorial levels,** starting from high priority actions: - Programmes and initiatives of relevance, including research and data infraestructures Target sectors and groups Funding options and agencies Recent and ongoing relevant projects
Part 3 - Activities to promote SRIA implementation	→	**What can be done in the short-term** to promote the implementation of the SRIA: Networking, engagement, aligment, lobbying Training and capacity building Start-up and pilot actions Communication and outreach

It has to be noted that the outline of the Implementation Plan has been also discussed and endorsed at the level of the GSO BlueMed WG.

The 13 Fiches were filled-in over summer 2019 by the co-champion countries together with representatives of the supporting countries and circulated to the BlueMed Platforms in advance of their 2019 meeting (October, UfM Secretariat, Barcelona).

The meeting´s dynamic in which almost all representatives could attend all parallel discussions and give their input on each priority, allowed key discussion.

The aim of the sessions was also to agree, based on the Part 3 of the Fiches ("Activities to promote the SRIA Implementation"), **on a limited number of promotional and strategic activities**, which upon endorsement of the GSO BlueMed WG would be the skeleton of the present draft Implementation Plan. Based on the outcomes and agreements of the BlueMed meeting in Barcelona, an initial proposal of actions and activities to be implemented was presented to the GSO BlueMed WG in November 2019.

BlueMed IP endorsement, promotion and operationalization (2020 and beyond)

The **BlueMed Implementation Plan** was finally endorsed in Venice in January 2020. In parallel, some promotional actions already started, in particular if already foreseen in the lifecycle of the BlueMed CSA project and/or because of the commitment of the co-champion country willing to lead the process towards the implementation of the actions.

In this regard, the **leadership of the co-champion countries is essential** in the years to come, accomplishing the promotional activities and being proactive in triggering the necessary steps towards the implementation of the actions. At the same line, the **Operational Network of Funders** set-up in the framework of the BlueMed CSA has equally a crucial role in **ensuring the future execution of the Implementation Plan beyond the lifetime of the BlueMed CSA**.

AUTHORS AND CONTRIBUTORS

BlueMed Coordination and Support Action Editors

Barbanti Andrea, National Research Council, Italy
Bataille Amélie, European and International Affairs, National Institute for Earth Sciences and Astronomy, CNRS, France
Cadiou Jean-François, Ifremer, France
Campillos Llanos Mónica, Spanish Institute of Oceanography, Spain
Cappelletto Margherita, National Research Council, Italy
Chacón Campollo Esther, State Research Agency (AEI), Spanish Ministry of Science and Innovation, Spain
Trincardi Fabio, National Research Council, Italy
Trujillo Quintela Abraham, State Research Agency (AEI), Spanish Ministry of Science and Innovation, Spain

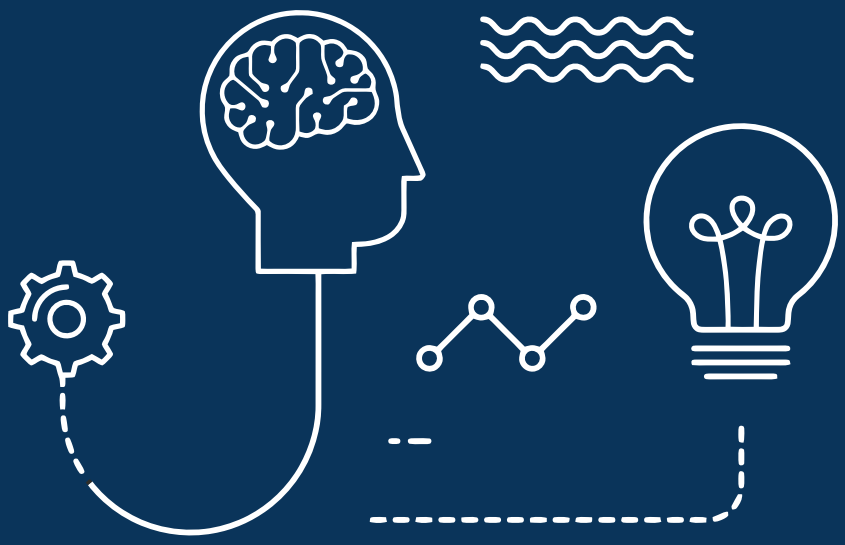
Group of Senior Officials BlueMed Working Group

Abuhussein Mahmoud, UFM/Higher Council for Science and Technology – HCST, Jordan
Angel Dror, University of Haifa, Israel
Aspris Christos, Directorate General for European Programmes, Coordination and Development, Cyprus
Cherif Sammari, National Institut of Sciences and Technologies of the Sea (INSTM), Tunisia
Drago Aldo, University of Malta, Malta
Fava Fabio, University of Bologna, Italy
Gruber Sigi, DG Research, European Commission
Iglesias Marta, DG Research, European Commission
Karageorgis Aris, Hellenic Centre for Marine Research – HCMR, Greece
Klein Emmanuelle, Ministry of High Education, Research and Innovation, France
Lizaso Miguel, DG Research, European Commission
Louanchi Feriel, National High School of Marine Science and Territory Management – ENSSMAL, Algeria
March Marta, Ministry of Economy and Competitiveness – MICINN, Spain
Salihoglu Baris, Middle East Technical University, Turkey
Shaltout Nayrah, National Institute of Oceanography and Fisheries, Egypt
Snoussi Maria, University Mohammed V in Rabat, Morocco

Other contributors from the BlueMed community: partners of the BlueMed CSA project, BlueMed National Pivots joining the BlueMed Platforms, co-champion countries´ editors, experts, stakeholders.

Aboul-Ela Haiam, National Institute of Oceanography & Fisheries (NIOF), Egypt
Al-Ahliyya Fawwaz Elkarmi, University, Jordan
Andreone Gemma, National Research Council, Italy
Angelucci Maria, e-Geos, Italy
Anwari Nabir, Ministry of Agriculture, Fisheries, Rural Development, Water and Forest, Morocco
Arnaud Nicolas, National Institute for Earth Sciences and Astronomy, CNRS, France
Bel Hassen Malika, National Institute of Marine Sciences and Technologies, Tunisia
Bonanno Angelo, National Research Council, Italy
Bongailas Jason, Malta Marittima Agency (MMA), Malta
Boukthir Moncef, Preparatory Institut for Engineering Studies, Tunisia
Bugeja George, The Malta Council for Science & Technology (MCST), Malta
Buongiorno Bruno, National Research Council, Italy
Cariola Monica, National Research Council, Italy
Casacchia Ruggero, National Research Council, Italy
Cermelj Branko, National Institute of Biology, Slovenia
Chacón Esther, State Research Agency (AEI), Spanish Ministry of Science and Innovation, Spain
Chevalier de Corbiac Claudiane, Ifremer, France
Ciappi Elena, National Research Council, Italy
De Lara José, Spanish Maritime Cluster, Spain
Drago Aldo, University of Malta, Malta
Edelist Dori, University of Haifa, Israel
ElGezairy Tarek, National Institute of Oceanography & Fisheries (NIOF), Egypt
ELTaweel Amr, University of Science and Technology, Egypt
Espinosa Víctor, Polytechnic University of Valencia, Spain
Fahim Reda, Arab Academy for Science, Technology and Maritime Transport Egypt
Fernández Estrella, State Research Agency (AEI), Spanish Ministry of Science and Innovation, Spain
Fernández Rosa, Technological Centre of the Sea (CETMAR), Spain
Francocci Fedra, National Research Council, Italy
García Carlos, Spanish Institute of Oceanography, Spain
Ghibri Mounir, National Institute of Oceanography and experimental Geophysics, (OGS), Italy
Giannakourou Antonia, Hellenic Centre for Marine Research (HCMR), Greece

Giovannelli Donato, Institute for Biological Resources and Marine Biotechnology (IRBIM), Italy
Giuffredi Rita, National Research Council, Italy
Grandi Silvia, Italian Ministry of Economic Development, Italy
Grimes Samir, National High School of Marine Science and Territory Management, Algeria
Herrouin Guy, Pôle Mer Méditerranée, France
Iosifidis Alexandros, Research Promotion Foundation Cyprus, Cyprus
Juvan Emil, University of Primorska Slovenia
Kastanidi Erasmia, Hellenic Centre for Marine Research, Greece
L'Astorina Alba, National Research Council, Italy
Luna Gian Marco, National Research Council, Italy
Machado Paulo, Directorate General of Seas Policy (DGPM), Portugal
Malacic Vlado, National Institute of Biology, Slovenia
Manente Mara, CISET University of Venice, Italy
Mastracci Federica, Telespazio, Italy
Myroshnychenko Volodymyr, Institute of Marine Sciences, Middle East Technical University, Turkey
Pagou Popi, Hellenic Centre for Marine Research (HCMR), Greece
Palanques Albert, High Council of Scientific Research (CSIC), Spain
Pereira Ricardo, Foundation for Science and Technology (FCT), Portugal
Photiades Marinos, Research and Innovation Foundation, Cyprus
Pikelj Kristina, University of Zagreb, Croatia
Quero Grazia, Zoologic Station Anton Dohrn, Italy
Ribera d'Alcalà Maurizio, Zoologic Station Anton Dohrn, Italy
Sadok Salwa, National Institut of the Sciences and Technologies of the Sea (INSTM), Tunisia
Schembri Franco, Resource Recovery & Recycling Agency (RRRA), Malta
Sedlar Damir, University of Split, Croatia
Sempere Richard, National Council of Scientific research (CNRS), France
Sensi Alessandra, Union for the Mediterranean Secretariat
Skerlic Iztok, Municipality of Izola, Slovenia
Sousa Ventura, AIN, Portugal,
Sprovieri Mario, National Research Council, Italy
Streftaris Nikos, Hellenic Centre for Marine Research (HCMR), Greece
Twrdy Elen, University of Lubjana, Slovenia
Vilivic Ivica, Institute of Oceanography and Fisheries, Croatia
Wohrer Claude, General Secretariat of the Sea, France
Yucel Mustafa, Institute of Marine Sciences, Middle East Technical University, Turkey
Zammit Alison, Malta College of Arts, Science and Technology (MCAST), Malta



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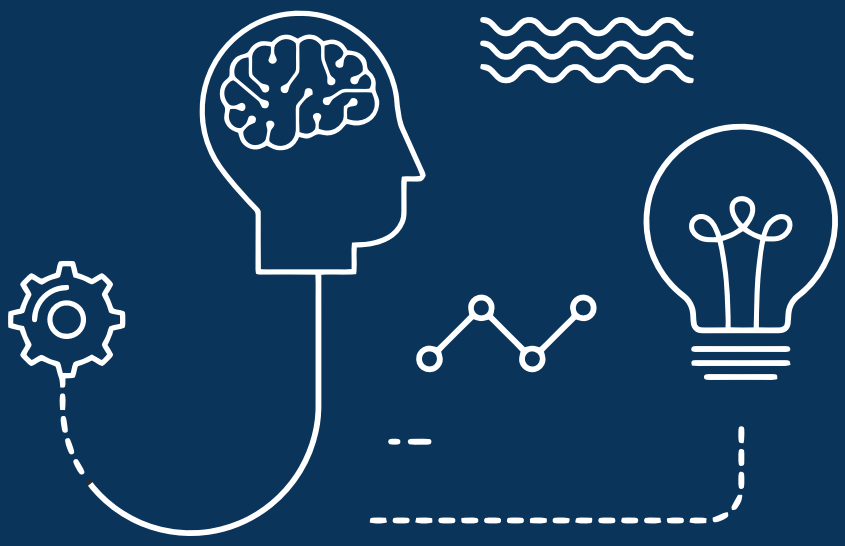
blueMed



BLUEMED

PRELIMINARY IMPLEMENTATION PLAN

Horizon 2020 - BG-13-2016
Grant Agreement 727453

ANNEX 1
BLUEMED FICHES FOR THE 13 PRIORITIES

June 2020

bluemed

BLUEMED

PRELIMINARY IMPLEMENTATION PLAN

Horizon 2020 – BG-13-2016
Grant Agreement 727453

ANNEX 1
BLUEMED FICHES FOR THE 13 PRIORITIES

June 2020

Authors

Fabio Trincardi (CNR, Italy)
Margherita Cappelletto (CNR, Italy)
Andrea Barbanti (CNR, Italy)
Jean-François Cadiou (IFREMER, France)
Amélie Bataille (CNRS, France)
Mónica Campillos Llanos (IEO, Spain)
Esther Chacón Campollo (AEI, Spain)
Abraham Trujillo Quintela (AEI, Spain)

Experts from the co-champion countries

Algeria: Ferial Louanchi
Croatia : Ivica Vilivic
Cyprus: Marinos Photiades
Egypt: Reda Fahiem, Amr ELTaweel, Haiam Abuelela and Tarek ElGezairy
France: Jean-François Cadiou
Greece: Popi Pagou
Israel: Dori Edelist
Italy: Mario Sprovieri, Andrea Barbanti, Elena Ciappi, Gian Marco Luna, Angelo Bonanno and Mounir Ghibri
Jordan: Fawwaz Elkarmi
Malta: George Bugeja and Aldo Drago
Morocco: Maria Snoussi
Slovenia: Emil Juvan
Spain: José de Lara
Tunisia: Moncef Boukthir, Malika Bel Hassen and Salwa Sadok
Turkey: Baris Salihoglu and Mustafa Yucel

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FICHE 1

UNDERSTANDING POLLUTION IMPACTS, MITIGATION AND REMEDIATION IN THE MEDITERRANEAN SEA

CO-CHAMPION COUNTRIES: ITALY & TUNISIA

Background

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. However, development and implementation of strategies for prevention, mitigation and remediation of environmental pollutants is becoming a major challenge for the Mediterranean countries. In this context, innovative technologies for sustainable remediation is a potentially important priority.

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 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 of the SRIA 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...).

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 (UNEP/MAP, the UN-Decade for Ocean Science and the G7&G20 Groups).

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
AQUA-LIT Preventive Measures for Averting the Discarding of Litter in the Marine Environment from the Aquaculture Industry **SRIA Action:** D2.4	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01/01/2019 - 31/12/2020	**EU Contribution:** 469.800,00€ **Website:** https://aqua-lit.eu/	• Prevent marine littering from aquaculture activities. • Have better monitoring schemes in place. • Remove and recycle litter from the aquaculture facilities both before litter enters the sea and for litter already existing at sea.
PLASTIC BUSTERS MPA$_s$ preserving biodiversity from plastics in Mediterranean Marine Protected Areas"	**Call:** Interreg MED Programme 2014-2020 **Duration:**01/02/2018-31/01/2022	**EU Contribution:** 5 Mil **Website:** https://plasticbustersmpas.interreg-med.eu/	• Contribute to maintaining biodiversity and preserving natural ecosystems in pelagic and coastal MPAs, by defining and implementing a harmonized approach against ML.

CLAIM Cleaning litter by developing & applying innovative methods in European seas	**Call:** HORIZON 2020 - Blue green innovation for clean coasts and seas **Duration:** 01/11/2017 - 31/10/2021	**EU Contribution:** 5.654.786 € **Website:** http://www.claim-h2020project.eu/	• Develop innovative technologies able to reduce the amount and impact of plastic pollution on the ecosystem-based services of the Mediterranean and Baltic Seas. • Set the basis for operational forecasting of the impacts of marine plastic litter pollution on ecosystem services. • Develop new business model to enhance the economic feasibility for upscaling the innovative cleaning technologies. • Change policy and public perceptions and provide advice for management decision-making.
EPHEMARE Ecotoxicological effects of microplastics in marine ecosystems	**Call:** 2014 JPI Oceans Pilot **Duration:** 31/12/2015 - 31/12/2018	**EU Contribution:** 3.154.000 € **Website:** http://www.jpi-oceans.eu/ephemare	• Investigate the uptake, tissue distribution and final fate of microplastics in organisms' representative of pelagic and benthic ecosystems. • Investigate the toxic effects of microplastics on marine organisms and the potential role of microplastics as vectors of marine pollutants and their trophic transfer in marine food webs. • Investigate detrimental effects at molecular, cellular, physiological and organism levels. • Assist public and private stakeholders with the scientific basis for the development and compliance with general environmental regulations concerning chemicals used in plastic production (WFD, MSFD, environmental quality standards, REACH, Directive 2002/72/ECEU and subsequent amendments, Regulation No 10/2011).
SMS Sensing toxicants in Marine waters makes Sense using biosensors	**Call:** FP7-OCEAN-2013 **Duration:** 01/12/2013-31/08/2017	**EU Contribution:** 4.144.263 € **Website:** http://www.project-sms.eu/	Deliver a novel automated networked system that will enable real-time in situ monitoring of marine water chemical and ecological status in coastal areas by the detection of a series of contaminants regulated by the MSFD.

SEA CHANGE Our ocean/Our health	**Call:** H2020-BG-2014-1 **Duration:** 01/03/2015 – 28/02/2018	**EU Contribution:** 3.494.876 € **Website:** https://www.seachangeproject.eu/	• Compile an in-depth review of the links between Seas and Ocean and Human health based on latest research knowledge outputs. • Help to design and implement successful mobilization activities focused on education, community, governance actors and directly targeted at citizens. • Ensure Knowledge exchange with transatlantic partners to bring about a global approach to protecting the planet's shared seas and ocean.
VECTORS VECTORS of Change in European Marine Ecosystems and their Environmental and Socio-Economic Impacts	**Call:** FP7-OCEAN-2010 **Duration:** 01/02/2011-31/01/2015	**EU Contribution:** 12. 484. 835 € **Website:** https://www.marine-vectors.eu/	• Elucidate the drivers, pressures and vectors that cause change in marine life and their impacts on ecosystem structures and functioning, and on the economics of associated marine sectors and society. • Provide solutions and tools for relevant stakeholders and policymakers.
TOPIOS Tracking Of Plastic In Our Seas	**Call:** ERC-2016-STG **Duration:** 01/04/2017-31/03/2022	**EU Contribution:** 1. 484. 760 € **Website:** http://topios.org/	• Creating a novel comprehensive modeling framework that tracks plastic movement through the ocean, simulating fragmentation, sinking, beaching, wave-mixing and ingestion by biota. • Inform policymakers, the public and engineers on where and how to best invest resources in mitigating the problem of plastic in our ocean.
EMBLAS-PLUS "improving environmental monitoring in the black sea: selected measures"	**Call:** European Union **Duration:** 2019-2020	**EU Contribution:** 1.55 mil € **Website:** http://emblasproject.org	• Improve protection of the Black Sea environment. • Improve availability and sharing of marine environmental data from the national and joint regional monitoring programmes aligned with the MSFD and WFD principles and the Black Sea Integrated monitoring and Assessment Programme (BSIMAP); • Support joint actions to reduce river and marine litter.

COMMON SENSE cost-effective sensors, interoperable with international existing ocean observing systems, to meet eu policies requirements	**Call:** FP7-OCEAN-2013 **Duration:** 01/11/2013 – 28/02/2017	**EU Contribution:** 4. 664. 072 € **Website:** www.commonsenseproject.eu/media/sensor-profiles	• Developing innovative sensors in order to increasing the availability of standardised data on: eutrophication; concentrations of heavy metals; micro plastic fraction within marine litter; underwater noise; and other parameters such as temperature, pH, pCO2 and pressure. • Provide key tool for EU Member States in meeting their MSFD requirements and achieving Good Environmental Status (GES) of their marine territories.
IMPRESSIVE Integrated Marine Pollution Risk assessment and Emergency management Support Service In ports and coastal enVironments	**Call:** H2020-SPACE-2018 **Duration:** 01/12/2018 – 31/05/2021	**EU Contribution:** 1.913. 701,25 € **Website:** http://impressive-project.eu/about-impressive/	Developing of remotely operated sophisticated tools integrated with very high resolution models and EO products (satellite, ASV, UAV) for pollution control in harbors and coastal areas; a graduated system of alert that will help to cope with and as quickly as possible.
MERCES Marine Ecosystem Restoration in Changing European Seas	**Call:** H2020-SC5-2015-two-stage **Duration:** 01/06/2016 – 31/05/2020	**EU Contribution:** 6. 651. 118,20 € **Website:** http://www.merces-project.eu/	Restoration of different degraded marine habitats, with the aim of: 1) Assessing the potential of different technologies and approaches. 2) Quantifying the returns in terms of ecosystems services and their socio-economic impacts. 3) Defining the legal-policy and governance frameworks needed to optimize the effectiveness of the different restoration approaches.
EFFACE European Union Action to Fight Environmental Crime	**Call:** FP7-SSH-2012-2 **Duration:** 01/12/2012 – 31/03/2016	**EU Contribution:** 2. 318. 624,70 € **Website:** https://efface.eu/	Assessing the impacts of environmental crime as well as effective and feasible policy options for combating it from an interdisciplinary perspective, with a focus on the EU.
GREENER	**Call:** H2020-NMBP-BIO-CN-2018 **Duration:** March 2019 – Feb 2023	**EU Contribution:** 4 964 168,25€ **Website:** https://cordis.europa.eu/project/rcn/221215/factsheet/en	GREENER proposes the development of innovative, efficient and low-cost hybrid solutions that integrate bioremediation technologies with bio-electrochemical systems (BES). The project will investigate the synergetic effect of different bioremediation strategies and demonstrate effective pollutants removal in water and soil/sediments, while generating side products of interest, such as bioelectricity.

ECLAIRE Effects of Climate Change on Air Pollution Impacts and Response Strategies for European Ecosystems	**Call:** FP7-ENV-2011 **Duration:** 01/10/2011 – 30/09/2015	**EU Contribution:** 6. 997. 001 € **Website:** http://www.eclaire-fp7.eu/	• Investigates the ways in which climate change alters the threat of air pollution on European land ecosystems including soils. • Establish new flux, concentration and dose-response relationships, as a basis to inform future European policies.

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL STRATEGIES AND PROGRAMMES

- JERICO Research Infrastructure: http://www.jerico-ri.eu/
- EMODnet for National, Regional or Local Government Agencies.
- IUCN Mediterranean Programme 2017-2020: https://www.iucn.org/sites/dev/files/content/documents/iucn_mediterranean_programme_2017-2020.pdf
- UICN Marine Mediterranean Programme: https://www.iucn.org/regions/mediterranean/our-work/mediterranean-marine-programme
- Mediterranean Action Plan (MAP) (http://web.unep.org/unepmap/who-we-are/mediterranean-action-plan)
- Barcelona Convention System https://web.unep.org/unepmap/who-we-are/legal-framework
- Medcop Climat : http://medcopclimat.com/
- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021) https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
- UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020) https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf
- UfM Working Group on Blue Economy https://ufmsecretariat.org/ufm-working-group-blue-economy/
- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects https://ufmsecretariat.org/what-we-do/water-environment/

INTERNATIONAL PROTOCOLS AND INITIATIVES

Seven Protocols addressing specific aspects of Mediterranean environmental conservation complete the MAP legal framework:

- Dumping Protocol: The Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft (adopted in 1976, amended in 1995 – amendments not yet in force).
- LBS Protocol (including Regional plans under art. 15 of LBS) entered into force in 2011: The Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (adopted in 1980, amended in 1996), amendment entered into force in 2008.
- SPA & Biodiversity Protocol: The Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (adopted in 1995, replacing the related protocol of 1982) and Annexes (adopted in 1996, amended in 2009, 2012 and 2013), entered into force in 1999.
- Prevention and Emergency Protocol: The Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea (adopted 2002, replacing the related Protocol of 1976), entered into force in 2004.
- Offshore Protocol: The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (adopted in 1994), entered into force in 2011.
- Hazardous Wastes Protocol: The Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (adopted in 1996), entered into force in 2008.
- ICZM Protocol: The Protocol on Integrated Coastal Zone Management in the Mediterranean (adopted in 2008), entered into force in 2011.
- Implementation of the Prevention and Emergency Protocol: REMPEC - UNEP (Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea) http://www.rempec.org/
- Sustainable Development Goals Agenda (UN, 2015): and in particular SDG14 ("Life below water") (https://sustainabledevelopment.un.org/sdg14
- International Legally Binding Instrument under the UN Convention on the Law of the Sea (UNCLOS) on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ) (https://enb.iisd.org/oceans/bbnj/igc3/

EUROPEAN STRATEGIES AND PROGRAMMES

- Marine Strategy Framework Directive:
  https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32008L0056
- Water Framework Directive:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060
- Maritime Spatial Planning Directive:
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089
- A European Strategy for Plastics in a Circular Economy
  https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1516265440535&uri=COM:2018:28:FIN

RELEVANT INDIRECT MEASURES

- Sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment, Updated Bioeconomy Strategy (doi:10.2777/792130): https://ec.europa.eu/research/bioeconomy/pdf/ec_bioeconomy_strategy_2018.pdf#view=fit&pagemode=none
- Closing the loop - An EU action plan for the Circular Economy: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0614
- Revised legislative framework on waste - Official Journal of the European Union, L 150, 14 June 2018.

Target sectors and groups

A number of specific sectors represent natural assets of collaboration at pan-Mediterranean scale in the field of this key topic. In particular:

- Aquaculture and potential impact on pollution and the health of the marine ecosystem.
- Coastal tourism and effects on pollution at small to large-scale.
- Shipping and pollution impacts on all the environmental matrices.
- Ports and effects on pollution at small to large-scale.
- Seabed mining (sand borrowing sites on continental shelves, and deep see mining for nodules and ore deposits) and impact on seawater and sediments in terms of widespread impact of pollutants and transfer to the food web.
- Health of the ecosystem.
- Stakeholder's engagement for assessment of contamination impact and searching/applying mitigation/remediation solutions.
- Re-suspension of polluted sediments (in response to major meteorological or geological events) and their transport to areas originally not impacted by pollution.
- Coastal landfills that may become exposed and leak pollutants into the coastal seas.
- Water column pollution events and their possible impact on mussel cultivations and other aquaculture sites.
- Oil spills from offshore platforms, pipelines and tankers.
- Plastic with particular reference to single use plastic ending up in the ocean.

- Need to improve our collective ability to measure substances that are in some cases very difficult (and expensive) to detect; develop a network of labs (in an inter-calibrated and comparable way).
- Analysis of chemicals leaked from munitions deployed at sea and coordinated approaches to mitigation and remediation.
- Investigation of effects of shipwrecks abandoned at the sea bottom (and, specifically, effects of chemical leakage and/or release) and analysis of their effects on the surrounding marine ecosystem.
- Emerging contaminants (pharmaceuticals, hormones, etc.) and effects on the ecosystem and fishery compartment. Analytical intercalibration of laboratory hubs and approaches to chemical dynamics of metabolite.
- Effects of mixtures of contaminants and role played by antagonistic and synergistic effects on the ecosystem and trophic web.
- Noise.
- Light pollution (from traffic and also from coastal urban areas).
- Coastal Urban development:
    - Wastewater treatment;
    - Efficiency of waste management;
    - Circular economy in cities.
- Impact of rivers on pollution at sea; development of good practices from prevention and control of land based activities; good practices examples are the Rivers Contract (Italy, Ministry of Environment) and the Contrat de rivière (France).

Technology platforms (European, national):

Maritime Clusters

- European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
- Pole Mer Mediterranee (https://www.polemermediterranee.com/).
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Intergovernmental bodies:

- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en).
- UNEP/MAP (http://web.unep.org/unepmap/) and its Regional Centers.
- IOC-UNESCO (http://msp.ioc-unesco.org/).
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).

Research bodies, businesses and local authorities

- European Environmental Agency (https://www.eea.europa.eu/).
- Institute for Advanced Sustainability Studies (https://www.iass-potsdam.de/en).
- Organization for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).
- The European Fisheries Areas Network (FARNET) (https://ec.europa.eu/fisheries/cfp/eff/farnet_en).
- Mediterranean Advisory Council (http://en.med-ac.eu/index.php).

Thematic platform:

- European Circular Economy Stakeholder Platform, Platform to exchange and interact, and make circular economy happen faster (https://circulareconomy.europa.eu/platform/).
- Blue Bioeconomy Platform (https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1349).

Associations:

WWF, GREENPEACES, OCEANA, FEMISE, etc.

Funding options and agencies

European funding:

- Horizon 2020 (in particular SC2-BG) (https://ec.europa.eu/programmes/horizon2020/en).
- European Maritime and Fisheries Fund (EMFF) (in particular the calls/tenders on Blue Economy) (https://ec.europa.eu/fisheries/cfp/emff_en; https://ec.europa.eu/fisheries/sites/fisheries/files/docs/c-2018-8384-annex_en.pdf).
- Interreg MED – 2014-2020 (in particular Axes 3 "Natural and cultural resources") (https://interreg-med.eu/).
- Sustainable Blue Economy Call (https://ec.europa.eu/easme/en/section/european-maritime-and-fisheries-fund/sustainable-blue-economy).
- Blue Technology - transfer of innovative solutions to sea basin economies (https://ec.europa.eu/easme/en/call-proposals-blue-technology-transfer-innovative-solutions-sea-basin-economies).
- Blue Labs - innovative solutions for maritime challenges (https://ec.europa.eu/easme/en/call-proposals-blue-labs-innovative-solutions-maritime-challenges).
- Interreg Mediterranean Programme (https://interreg-med.eu/).
- Bio-based Industries Joint Undertaking (https://www.bbi-europe.eu).
- JERICO (http://www.jerico-ri.eu/).
- LIFE programme (https://ec.europa.eu/easme/en/life).
- JPI-O action: Science4GES "*Science for Good Environmental Status*".
- European Regional Development Fund (ERDF).
- Cohesion Fund (CF).

International funding:

- Green Climate Fund (https://www.greenclimate.fund).
- Adaptation fund (https://www.adaptation-fund.org).
- Global Environment Fund (GEF) (www.globalenvironmentfund.com).

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Participation in the Maritime Clusters. • Participation in the Research organizations (e.g. JERICO).	**How:**	Thematic workshops for stakeholders.
		When:	At least one per year.
Alignment and coordination	• GSO BLUEMED Working Group. • Alignment and coordination with coherent EUSAIR initiatives. • Alignment and coordination with coherent UNESCO/IOC Initiatives. • Alignment and coordination with UNEP/MAP initiative dedicated to ecotoxicology and marine pollution.	**How:**	Meetings.
		When:	At least one each 6 months.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Research organizations	**How:**	Development of strategies and plans for pollution monitoring, data exchange, mitigation and remediation of impacts.
		When:	To be assessed.
Identifies priorities for prevention and remediation action plan	• Addressing key GAPs and developing a framework that looks also at land-sea interaction. Focus on policy aspects.	**How:**	Working groups.
		When:	At least one each 6 months.
Start-Up actions	• Blue Labs • EU funding calls • Research organizations	**How:**	Calls.
		When:	Each year.
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• GSO BLUEMED Working Group • EU Advisory Groups • Research organizations	**How:**	To be defined. One ongoing action is the BLUEMED Pilot: *Towards Plastic-free, Healthy Mediterranean Sea.*
		When:	To be assessed.
Lobbying actions		**How:**	
		When:	
Training and capacity building initiatives	• Research organizations	**How:**	Courses, training days, workshops.
		When:	
Implementation Working Groups (IWG) on specific sectors	• GSO BLUEMED Working Group • EU Advisory Groups • Research organizations	**How:**	
		When:	

FICHE 2

SUPPORT SOLUTIONS FOR SUSTAINABLE PRODUCTION AND CONSUMPTION OF FOOD FROM THE SEA

CO-CHAMPION COUNTRIES: SPAIN & EGYPT

Background

This priority, together with the related goals, 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 natural and anthropogenic phenomena, are already affecting food production in the Mediterranean region.

The importance of the concept of Sustainable Food Consumption nowadays related to the increase of the demands of food, e.g. tourism, and the increase of food waste, implies a new perspective to be consider due to new practices to be applied, considering the application of better society behaviors or the establishment of better consumer practices.

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.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
AQUA-LIT Preventive Measures for Averting the Discarding of Litter in the Marine Environment from the Aquaculture Industry **SRIA Action:** D2.4	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01/01/2019 - 31/12/2020	**EU Contribution:** 469.800,00€ **Website:** https://aqua-lit.eu/	• Prevent marine littering from aquaculture activities; • Have better monitoring schemes in place; • Remove and recycle litter from the aquaculture facilities both before litter enters the sea and for litter already existing at sea.
PLASTIC BUSTERS MPAS	https://plasticbustersmpas.interreg-med.eu/		Contribute to maintaining biodiversity and preserving natural ecosystems in pelagic and coastal MPAs, by defining and implementing a harmonized approach against ML.
PANACEA	https://biodiversity-protection.interreg-med.eu/biodiversity-protection-community/panacea-partnership/		

AQUAEXCEL^{2020} AQUAculture infrastructures for EXCELlence in European fish research towards 2020 **SRIA Action:** D2.4	**Call:** H2020-INFRAIA-2014-2015 – Research and innovation action **Duration:** 01/10/2015-30/09/2020	**EU Contribution:** 9.708.867€ **Website:** http://www.aquaexcel2020.eu/	The project integrates a large group of leading European aquaculture research facilities and aims to advance aquaculture research and innovation in Europe. One of its key aspects will be to provide subsidised access to top-class aquaculture facilities, as well as numerous highly pertinent services for researchers from academia and industry.
CONFISH Network of fish stock recovery areas **SRIA Action:** D2.2 / D2.3	**Call:** INTERREG **Duration:** 18 months	**EU Contribution:** 560.000€ **Website:** https://confish.interreg-med.eu/	The project aims to design a Mediterranean-based network that relies on robust social framework and innovative evolutionary science for future implementation of bottom up approach into fishery management. The overarching goal is to promote knowledge transfer between evolutionary scientists and local fishery stakeholders towards sustainable fisheries management.
FishMPABlue2 Fishing governance in MPAs: potentialities for Blue Economy 2 **SRIA Action:** D2.2 / D2.3	**Call:** INTERREG Programme MED 2014-2020 **Duration:** 01 November 2016 – 31 October 2019	**EU Contribution:** 2.975.000,00€ **Website:** https://fishmpablue-2.interreg-med.eu/	The FishMPABlue 2 project addresses and proposes solutions to existing and potential conflicts. It involves key actors in the planning of conservation measures and fishery regulation processes in a context of sustainable governance involved in Blue Economy.
TAPAS Tools for Assessment and Planning of Aquaculture Sustainability **SRIA Action:** D2.4	**Call:** H2020-SFS-2015-2 **Duration:** 01 March 2016 – 29 February 2020	**EU Contribution:** 6.918.512,50€ **Website:** http://tapas-h2020.eu/about/	TAPAS aims to consolidate the environmental sustainability of European aquaculture by developing tools, approaches and frameworks to support EU Member States in establishing a coherent and efficient regulatory framework, implementing the Strategic Guidelines for the sustainable development of European aquaculture and delivering a technology and decision framework for sustainable growth.
MedAID Mediterranean Aquaculture Integrated Development **SRIA Action:** D2.4	**Call:** H2020-SFS-2016-2 **Duration:** 01 May 2017 – 30 April 2021	**EU Contribution:** 6.999.996,25€ **Website:** http://www.medaid-h2020.eu/	MedAID aims to increase the overall competitiveness and sustainability of the Mediterranean marine fish farming aquaculture sector, throughout the whole value chain. Its objectives will be achieved: • To identify the main technical, environmental, economic and social challenges, • By addressing those technical, environmental, economic and social challenges that the sector currently faces, • By developing innovative knowledge and tools to improve the performance of the production systems.

ParaFishControl Advanced Tools and Research Strategies for Parasite Control in European farmed fish **SRIA Action:** D2.4	**Call:** H2020-SFS-2014-2 **Duration:** 01 April 2015 – 31 March 2020	**EU Contribution:** 7.800.000€ **Website:** http://www.parafishcontrol.eu/	The overarching goal of ParaFishControl is to increase the sustainability and competitiveness of the European aquaculture industry by improving our understanding of fish-parasite interactions and by developing innovative solutions and tools for the prevention, control and mitigation of the most harmful parasitic species affecting the main European farmed fish species.
STREAMLINE Optimal utilization of seafood side-streams through the design of new holistic process lines **SRIA Action:** D2.1 / D2.4	**Call:** H2020-BBI-JTI-2018 **Duration:** 01 May 2019 – 30 April 2023	**EU Contribution:** 3.197.397€ **Website:** https://cordis.europa.eu/project/rcn/222679/factsheet/en	The objective of the STREAMLINE project is to solve challenges that prevent more sound exploitation of the aquatic resources. This will be obtained by developing, sorting technologies, storage solutions and decision tools that will secure an efficient, sustainable supply system for by-catches, as well as for solid and liquid side-streams from aquaculture, fisheries and the aquatic processing industries to biorefining operations.
AquaIMPACT Genomic and nutritional innovations for genetically superior farmed fish to improve efficiency in European aquaculture **SRIA Action:** D2.1 / D2.4	**Call:** H2020-BG-2018-1 **Duration:** 01 January 2019 – 31 December 2022	**EU Contribution:** 6.149.963,14€ **Website:** https://cordis.europa.eu/project/rcn/218338/factsheet/en	AquaIMPACT is a major effort to integrate the fields of fish breeding and nutrition to increase the competiveness of EU's aquaculture of Atlantic salmon, rainbow trout, gilthead seabream and European seabass, to ensure food and nutrition security and to satisfy consumer demands for high-quality seafood with limited environmental impact.
PerformFISH Consumer driven Production: Integrating Innovative Approaches for Competitive and Sustainable Performance across the Mediterranean Aquaculture Value Chain **SRIA Action:** D2.4	**Call:** H2020-SFS-2016-2 **Duration:** 01 Mayo 2017 – 30 April 2022	**EU Contribution:** 6.997.060,74€ **Website:** http://performfish.eu/	The overarching objective of PerformFISH is to increase the competitiveness of Mediterranean aquaculture by overcoming biological, technical and operational issues with innovative, cost-effective, integrated solutions, while addressing social and environmental responsibility and contributing to "Blue Growth".
SMARTFISH Smart fisheries technologies for an efficient, compliant and environmentally friendly fishing sector **SRIA Action:** D2.2 / D2.3	**Call:** H2020-SFS-2017-1 **Duration:** 01 January 2018 – 31 December 2021	**EU Contribution:** 5.976.764,51€ **Website:** https://cordis.europa.eu/project/rcn/212401/factsheet/en	The objective of SMARTFISH is to develop, test and promote a suite of high-tech systems for the EU fishing sector, to optimize resource efficiency, to improve automatic data collection for fish stock assessment, to provide evidence of compliance with fishery regulations and to reduce ecological impact.

IFASA 2 Insects for a sustainable aquaculture 2 **SRIA Action:** D2.1 / D2.4	**Call:** H2020-SMEInst-2018-2020-2 **Duration:** 01 August 2018 – 31 July 2020	**EU Contribution:** 1.750. 000€ **Website:** https://cordis.europa.eu/project/rcn/217408/factsheet/en	Fish feed manufacturers and fish farmers are seeking innovative ways to increase the nutritional value of their products while reducing the environmental impact of their supply chain. Insect protein stands out as one of the best solution to address this need and drive the development of sustainable aquaculture.
PANDORA Paradigm for Novel Dynamic Oceanic Resource Assessments **SRIA Action:** D2.2 / D2.3 / D2.4	**Call:** H2020-SFS-2017-2 **Duration:** 01 May 2018 – 30 April 2022	**EU Contribution:** 5.598.388,75€ **Website:** https://cordis.europa.eu/project/rcn/214744/factsheet/en	Create more realistic assessments and projections of changes in fisheries resources by utilizing new biological knowledge. Advice on how to secure long-term sustainability of EU fish stocks. Provide recommendations on how to stabilize the long-term profitability of European fisheries. Develop a public, internet-based resource tool box.
EASY FEED: Eco-aquaponics systems – 100% sustainable and profitable EU fish-farming **SRIA Action:** D2.1 / D2.4	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01 January 2019 – 01 December 2021	**EU Contribution:** 438.563,00€ **Website:** https://easyfeed-project.eu/#	EASY FEED will validate the use of an innovative aquaculture organic feed formula, based on locally grown quinoa and spirulina, to reduce the aquaculture sector's dependence on marine resources.
DEMO-BLUESMARTFEED: Demonstration project of a smart technology for monitoring the delivery of feed for a sustainable aquaculture **SRIA Action:** D2.4	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01 January 2019 – 01 December 2021	**EU Contribution:** 740.615,00€ **Website:** http://bluesmartfeed.eu/	DEMO-BLUESMARTFEED will validate the SICA technology (Smart System for Feeding Control) to monitor and optimise aquaculture feed supply, hence reducing feed waste. The aim of this proposal is to validate the SICA technology (Smart System for Feeding Control) in two real environments (offshore cages) in Spain and Greece.
ALTERNFEED: Substitution of fish flour and fish oil by sustainable products and alternative by-products **SRIA Action:** D2.1 / D2.4	**Call:** Fundación Biodiversidad, Convocatoria Pleamar 2018 **Duration:** 2019 –2020	**EU Contribution:** 59.203,76 € **Website:** https://www.programapleamar.es/proyectos/sustitucion-de-harina-y-aceite-de-pescado-por-productos-sostenibles-y-subproductos	ALTERNFEED arises from the need to evaluate sustainable alternatives to the use of flour and fish oil or krill in the manufacture of fish feed by evaluating several alternative ingredients such insects meal, as a quality protein source, and a compound of microalgae, as an important source of protein or lipids depending on the parameters.

ALGADIET: Development and optimisation of new functional feeds based on the substitution of fish flours by micro and macroalgae for turbot fattening. **SRIA Action:** D2.1 / D2.4	**Call:** Fundación Biodiversidad, Convocatoria Pleamar 2018 **Duration:** 2018 –2020	**EU Contribution:** 177.056,89€ **Website:** https://www.programapleamar.es/proyectos/titulo-del-proyecto-desarrollo-y-optimizacion-de-nuevos-piensos-funcionales-basados-en-la	The general objective of this project is the development and optimisation of new functional feeds based on the partial substitution of fish flours by meal from micro and macroalgae biomasses for use in the growth of turbot (*Scophthalmus maximus*), based on the principles of sustainability and environmental protection in aquaculture.
SEAFOOD^{TOMORROW}: Nutritious, Safe and Sustainable Seafood for Consumers of Tomorrow **SRIA Action:** D2.1 / D2.4	**Call:** H2020-BG-2017-1 **Duration:** 01 November 2017 – 31 October 2020	**EU Contribution:** 6.996.032,25€ **Website:** https://seafoodtomorrow.eu/	SEAFOOD^{TOMORROW} aims to validate and optimize commercial solutions for improving the socioeconomic and environmental sustainability of the seafood production and processing industry, while contributing to product quality and safety. Activities will focus on the sustainable production and processing of nutritious and safe seafood products through the demonstration and first application in the market of eco-innovative, sustainable solutions of marine and aquaculture-derived food products and nutrients.

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL STRATEGIES AND PROGRAMMES

- FAO GFCM Strategy for Aquaculture: http://www.fao.org/3/I9766EN/i9766en.pdf
- FAO GFCM Strategy for sustainability in Fisheries: http://www.fao.org/3/a-i7340e.pdf
- General Fisheries Commission for the Mediterranean (GFCM – FAO): http://www.fao.org/gfcm/es/
- JERICO Research Infrastructure: http://www.jerico-ri.eu/
- IUCN Mediterranean Programme 2017-2020: https://www.iucn.org/sites/dev/files/content/documents/iucn_mediterranean_programme_2017-2020.pdf
- UICN Marine Mediterranean Programme: https://www.iucn.org/regions/mediterranean/our-work/mediterranean-marine-programme
- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021) https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
- UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020) https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf
- UfM Working Group on Blue Economy https://ufmsecretariat.org/ufm-working-group-blue-economy/
- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects https://ufmsecretariat.org/what-we-do/water-environment/

EUROPEAN STRATEGIES AND PROGRAMMES

- Strategic Guidelines for the sustainable development of EU aquaculture: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0229&from=EN
- The Common Fisheries Policy (CFP): https://ec.europa.eu/fisheries/cfp/
- Establishing a common organization of the EU markets in fishery and aquaculture products: https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/guidance-document-on-implementation-of-professional-organisations_en.pdf

Target sectors and groups

Technology platforms (European, national, regional):

- European Aquaculture Technology and Innovation Platform: http://eatip.eu/
- European Fisheries Technology Platform: http://eftp.eu/

Maritime Clusters

- European Network of Maritime Clusters (ENMC): https://enmc.eu/about-us/

Intergovernmental bodies:

- Union for Mediterranean (UfM): https://ufmsecretariat.org/
- FAO – Aquaculture: http://www.fao.org/aquaculture/en/
- FAO – Fishing: http://www.fao.org/fisheries/en/
- FAO – Sustainable Food: http://www.fao.org/sustainability/en/
- General Fisheries Commission for the Mediterranean (GFCM – FAO): http://www.fao.org/gfcm/es/
- Worldwide Responsible Accredited Production: http://www.wrapcompliance.org/sp

Research bodies, businesses and local authorities

- Sustainable Fish: https://www.sustainablefish.org/
- European Environmental Agency: https://www.eea.europa.eu/
- European Topic Center on Inland, Coastal and Marine Waters: https://www.eionet.europa.eu/etcs/etc-icm
- Slow food international: https://www.slowfood.com/
- Institute for Advanced Sustainability Studies: https://www.iass-potsdam.de/en
- Organisation for Economic Co-operation and Development (OECD): http://www.oecd.org/science/
- The European Fisheries Areas Network (FARNET): https://ec.europa.eu/fisheries/cfp/eff/farnet_en
- Aquaculture Advisory Council: https://www.aac-europe.org/en/
- Mediterranean Advisory Council: http://en.med-ac.eu/index.php
- Market Advisory Council: http://en.med-ac.eu/index.php
- EU Market Observatory for Fisheries and Aquaculture products (EUMOFA): http://www.eumofa.eu/
- Scientific, Technical and Economic Committee for Fisheries (STECF): https://stecf.jrc.ec.europa.eu/
- National Aquaculture links: https://ec.europa.eu/fisheries/cfp/aquaculture/links_en

Funding options and agencies

European funding:

- European Maritime and Fisheries Fund (EMFF): https://ec.europa.eu/fisheries/cfp/emff_en
- Sustainable Blue Economy Call: https://ec.europa.eu/easme/en/section/european-maritime-and-fisheries-fund/sustainable-blue-economy
- Blue Technology - transfer of innovative solutions to sea basin economies: https://ec.europa.eu/easme/en/call-proposals-blue-technology-transfer-innovative-solutions-sea-basin-economies
- Blue Labs - innovative solutions for maritime challenges: https://ec.europa.eu/easme/en/call-proposals-blue-labs-innovative-solutions-maritime-challenges

- Interreg Mediterranean Programme: https://interreg-med.eu/
- H2020 Programme: https://ec.europa.eu/programmes/horizon2020/en
- JERICO: http://www.jerico-ri.eu/
- LIFE programme: https://ec.europa.eu/easme/en/life

International funding:

- General Fisheries Commission for the Mediterranean (GFCM- FAO) http://www.fao.org/gfcm/es/

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Maritime Clusters. • Research organizations (e.g. JERICO). • European Commission.	**How:**	Workshops for detailed stakeholders.
		When:	At least one per year.
Alignment and coordination	• GSO BLUEMED Working Group. • Alignment and coordination with other initiatives as WESTMED or EUSAIR. • Alignment and coordination with other associations or organizations (GFCM- FAO; WRAP; UfM; etc.). • Alignment and coordination with EU organizations (FARNET; EATIP; EFTP; EUMOFA, etc.). • Coordination for eco-label aquaculture and fishing products (Marine Stewardship Council (MSC); Friends of the Sea (FoS); Aquaculture Stewardship Council (ASC)	**How:**	Meetings.
		When:	At least one each 6 months.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Implemented by the Advisory Groups: Aquaculture Advisory Council; Mediterranean Advisory Council or GFCM- FAO. • Research organizations: collaborate in the development of Strategies or Plans of future Horizon Europe. • Replicate or promote Italian-Tunisian collaboration on harmonisation of methods for seafood quality control.	**How:**	Development of the Strategies and Plans designed for sustainable fishing, aquaculture and seafood.
		When:	
Start-Up actions	• Blue Labs. • EU funding calls. • Research organizations. • Fishing and aquaculture eco-label products. • Call for research on multi-modal platforms, offshore wind farms and aquaculture.	**How:**	Calls.
		When:	Each year.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020–2023)]	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• GSO BLUEMED Working Group participating in different meetings in relationship with food. • EU Advisory Groups (Aquaculture, Fishing, Seafood) which includes BLUEMED initiative in the agendas. • Research organizations. • BLUEMED participation in calls about food production (future Horizon Europe, Interreg, etc.).	**How:**	
		When:	
Lobbying actions	• Actions to highlight the role of food production into BLUEMED.	**How:**	
		When:	
Training and capacity building initiatives	• Intergovernmental bodies. • Research organizations • Training/workshop for the exchange of best practices between Mediterranean countries on ideas to reduce food waste. • Capacity building activity on artisanal fisheries (to be elaborated with Slovenian colleagues). • Exchange of best practices between countries on fishing waste management on board (Malta seeking for how other countries deal with it).	**How:**	Courses, training days, workshops.
		When:	At least one per year.
Implementation Working Groups (IWG) on specific sectors	• GSO BLUEMED Working Group. • EU Advisory Groups (Aquaculture, Fishing, Seafood). • Research organizations.	**How:**	Meetings.
		When:	At least one each 6 months.
Communication and engagement	• GSO BLUEMED Working Group. • EU Advisory Groups (Aquaculture, Fishing, Seafood). • Research organizations. • Dissemination of good food practices to society. • Dissemination and science communication idea on collaborating with renowned Chefs to explain the nutrition potential of the seas – Med Network of Universities (Italy to give further details).	**How:**	News, social networks (Twitter, Facebook, Instagram...).
		When:	Social networks need to provide continually information.

FICHE 3

PREPARING TO CLIMATE CHANGE AND DEFINE ADAPTATION/MITIGATION MEASURES

CO-CHAMPION COUNTRIES: GREECE & MOROCCO

Background

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 rise by increased water-scarcity, and this would affect food production. On the other hand, the ocean is by far the largest water reservoir on the Earth but the marine water is salty. In addition, numerical models predicting the water vapour transport form the ocean on land could be considered as part of research activities in the framework of Blue Growth.

Furthermore, the Mediterranean accepts approximately one third of the global 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 differs across populations, economic sectors and regions within Mediterranean and the most vulnerable are the ones facing the most difficulty in adopting the necessary 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.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
CO-EVOLVE Promoting the co-evolution of human activities and natural systems for the development of sustainable coastal and maritime tourism	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 3.000. 000,00€ **Website:** https://co-evolve.interreg-med.eu	Aims at analyzing and promoting the co-evolution of human activities and natural systems in touristic coastal areas, facing effects due to climate change and allowing sustainable development of touristic activities, in coexistence and synergy with other uses of the coastal and marine space and resources, based on the principles of Integrated Coastal Zone Management and Maritime Spatial Planning.

MPA-ADAPT Guiding Mediterranean MPAs through the climate change era: building resilience adaptation	**Call:** "Interreg V-B Mediterranean" Operational Programme for the 2014-2020 **Duration:** 2016-2019	**EU Contribution:** 1.904.257 € **Website:** https://mpa-adapt.interreg-med.eu/	MPAs through the climate change era: building resilience adaptation) (2016-2019) aims to: 1) Raise awareness of the role of effective MPAs for enhancing resilience to climate change and safeguarding ecosystem services as well as contributing to adaptation measures; 2) Strengthen capacity of MPAs to plan for and respond to climate change impacts based on a better understanding of climate risk and vulnerability; 3) Showcase how climate change can be integrated into planning and management of Mediterranean MPAs. Five MPAs from three Mediterranean countries act as pilot sites for the development of climate change adaptation action plans and their integration into existing management framework.
ClimVar & ICZM Integration of climatic variability and change into national strategies to implement the ICZM Protocol in the Mediterranean	**Call:** Global Environmental Facility **Duration:** 2012–2015	**EU Contribution:** 9.200.000€ **Website:** https://pap-thecoastcentre.org/projects/cv.html	ClimVar & ICZM UNEP-MA Project (Integration of climatic variability and change into national strategies to implement the ICZM Protocol in the Mediterranean) project (2012–2015) aimed at: 1) strengthening knowledge on regional climate variability and change and on their impacts, defining their specific characteristics in the Mediterranean region; 2) Improving capacity building and establish mechanisms for exchange of data and information for integration of climate variability and change into concrete ICZM policies, plans and programmes.
MEDACC Life Project	**Call:** LIFE ENV/ES/000536 Demonstration and validation of innovative methodology for regional climate change adaptation in the Mediterranean area **Duration:** 2018	**EU Contribution:** 1.266.208 € **Website:** http://medacc-life.eu/es	MEDACC Life Project (2018) aimed to develop innovative solutions for adapting agroforestry and urban systems to the impacts of climate change in the Mediterranean area (Catalonia). A series of adaptation measures have been put into practice in the fields of agriculture, forest management and water management. The results of the project contribute to quantifying how adaptation can reduce the vulnerability of natural systems and human activities to climate change and assessing the economic and environmental costs associated with the application (or not) of these adaptation measures.
LIFE Blue Natura	**Call:** LIFE program **Duration:** 01 November 2016 – 31 October 2019	**EU Contribution:** 2.513.792 € **Website:** http://life-bluenatura.eu/es/inicio/	LIFE Blue Natura: represents an ambitious and innovative initiative to quantify blue carbon and protect coastal habitats in Andalusia.

Enhancing Regional Climate Change Adaptation in the Mediterranean Marine and Coastal Areas	**Call:** Global Environmental Facility **Duration:** 2016-2019	**EU Contribution:** 4.891.894 € **Website:** https://www.thegef.org/project/enhancing-regional-climate-change-adaptation-mediterranean-marine-and-coastal-areas	Enhancing Regional Climate Change Adaptation in the Mediterranean Marine and Coastal Areas (Financed by GEF). The Project objective was to assist countries to increase the resilience of the Mediterranean marine and coastal areas to the impacts of climate change with the view to influencing wider development processes in the region.
BRIdges The GAp for Innovations in Disaster resilience	**Call:** H2020 European Commission Project **Duration:** 2016-2020	**EU Contribution:** 6.999.996,25€ **Website:** www.brigaid.eu	BRIGAID is a 4-year project (2016-2020) under EU Horizon2020, aimed to effectively bridge the gap between innovators and end-users in resilience to floods, droughts and extreme weather
COASTAL **Co-creating evidence-based business roadmaps and policy solutions for enhancing coastal-rural collaboration and synergies** **SRIA Action:** E2.1, E2.6, E2.7	**Call:** H2020-SC2-RUR02-2017 **Duration:** May 2018 – April 2022	**EU Contribution:** n.a. **Website:** www.h2020-coastal.eu	The overarching objective of COASTAL is to improve the rural-coastal synergies in strategic business and policy decision making and collaboration between coastal and rural actors. This is achieved by developing, demonstrating and applying a generic toolset and performance indicators by combining a multi-actor approach with system dynamics modelling. This allows us to understand the interactions with market, demographic, environmental and climate forecasts, and quantify the positive and negative externalities. By combining local knowledge and scientific expertise in a co-creation process the COASTAL project engages actors and stakeholders at all levels to improve coastal-rural interdependence and collaboration by identifying problems and setting up evidence-based business roadmaps and policy solutions, focusing on economic growth, marine spatial planning, and environmental protection, including inland water quality.
CIGESMED Coralligenous based Indicators to evaluate and monitor the "Good Environmental Status" of the MEDiterranean coastal waters FP7 European Commission Project	**Call:** FP7 ERA-NET **Duration:** 01/03/2013 – 31/10/2016	**Website:** http://www.cigesmed.eu	The project's goal is to understand the links between natural and anthropogenic pressures and ecosystem functioning to define and maintain the Good Environmental Status (GES) of the Mediterranean Sea, by studying the typical, complex and not well-known habitats built by calcareous encrusting algae, the coralligen

ALIEM Action to limit the spread of invasive species introduced into the Mediterranean	**Call:** ERDF, 2014-2020 INTERREG V-A **Duration:** 2017- 2020	**EU Contribution:** 1.840.194,99 € **Website:** http://interreg-maritime.eu/ - http://interreg-maritime.eu/it/web/aliem/progetto	The issue of invasive exotic species is emerging and still poorly defined, although it has been recognised as the second cause of loss of biodiversity. These species do not know borders, and current ways of life increase their risk of being introduced. Some of these pose a threat to the economy and to health. Their propagation threatens hotspots of Mediterranean biodiversity, sensitive areas and, in particular, certain Natura 2020 sites near to introduction areas (ports, airports, etc.). To respond to this evolving phenomenon, in the difficult context of climate change, all we have available for this fight are limited means that do not respect the environment
BeRTISS BalkanMed real time severe weather service	**Call:** INTERREG Balkan-Med **Duration:** 2014 -2020	**EU Contribution:** 1.063.941,03 € **Website:** http://www.interreg-balkanmed.eu/approved-project/14/	BeRTISS - BalkanMed real time severe weather service (INTERREG Balkan-Med).The project aims to provide timely information and warning regarding severe weather events as well as long-term monitoring of weather and climate change in the region, through the mapping and visualization of water vapor
BlueCoast Climate-Smart Coastal Practices for Blue governance	**Call:** The Interreg IPA CBC Programme "Greece – Albania 2014 – 2020 **Duration:** 2014 -2020	**Website:** http://bluecoast-cbc.eu/index.php/project/	BLUECOAST objective is to provide applicable plans & pro-active methods based on long-term conservation goals and climate change adaptation policy, in order to increase C. caretta ecosystem resilience. It will address the major stresses at land & sea, driven by human impact and climate change integrating habitats resilience into the broader regional socioeconomic development. (Greece and Albania).
CLIMEPORT Mediterranean Ports' Contribution to Climate Change Mitigation	**Call:** INTERREG IVB - INTERREG IV - Transnational programmes **Duration:** 01 August 2018 – 31 July 2020	**EU Contribution:** 1.610.454,00 € **Website:** https://trimis.ec.europa.eu/project/mediterranean-ports-contribution-climate-change-mitigation	The CLIMEPORT project encourages Mediterranean Ports to combat climate change reducing greenhouse emissions and fostering a better use of energy in order to achieve sustainable development in port communities. During the project, an extensive benchmarking process will be carried out within the Mediterranean port sector concerning the use of environmental.
COASTANCE Regional COmmon Action STrategy Against Coastal Erosion and climate change effects for a sustainable coastal planning in the Mediterranean basin	**Call:** 2007-2013 Programme MED **Duration:** 01/04/2009 - 31/03/2012	**EU Contribution:** 1.425.415,00 € **Website:** https://climate-adapt.eea.europa.eu/metadata/projects/regional-common-action-strategy-against-coastal-erosion-and-climate-change-effects-for-a-sustainable-coastal-planning-in-the-mediterranean	Coastal erosion and flooding represent a major threat for the well-being and prosperity of the 70mi Europeans living within 500m from the coastline and their assets of 500- 1000bi€. Lost or seriously impacted area by erosion is estimated to be 15 km^2/year.

IONian Integrated marine Observatory	**Call:** European Territorial Cooperation Programme, Greece-Italy 2007-2013, ERDF and National Funds **Duration:** 01/01/2012 - 31/12/2013	**EU Contribution:** 1.688.734,00€ **Website:** http://www.ionioproject.eu/	The IONIO project is aimed at designing and implementing a "IONian Integrated marine Observatory" that will provide environmental information and meteo-oceanographic measurements about the Southern Adriatic and Northern Ionian (SANI) Programme Area.
MED-JELLYRISK Integrated monitoring of jellyfish outbreaks under anthropogenic and climatic impacts in the Mediterranean Sea (coastal zones): trophic and socio-economic risks	**Call:** 2007 - 2013 Mediterranean Sea Basin ENPI CBC, ERDF **Duration:** 01 January 2019 – 01 December 2021	**Website:** http://jellyrisk.com	The Mediterranean coasts are facing increasing jellyfish outbreaks resulting from a wide variety of human activities including maritime transport, exploitation of living resources, discharges together with the impact of climate change. The MED-JELLYRISK is the first CBC (Cross-Border Cooperation) project assessing the socio-economic impacts of jellyfish blooms and the implementation of mitigation countermeasures.
The OrientGate A structured network for integration of climate knowledge into policy and territorial planning	**Call:** South East Europe Transnational Cooperation Programme **Duration:** 2012 –2014	**EU Contribution:** 3.354.355,00 € **Website:** http://www.orientgateproject.org/	The project aims to implement concerted and coordinated climate adaptation actions across South Eastern Europe (SEE). A structured network for integration of climate knowledge into policy and territorial planning.

Programmes and initiatives of relevance, including research and data infrastructures

- The 19th meeting of Contracting Parties (COP19) of the Barcelona Convention endorsed in 2016 the 'Regional Climate Change Adaptation Framework for the Mediterranean Marine and Coastal Areas'. The document aims at building a common regional strategic approach to increasing climate resilience and adaptation capacity.

- In February 2016, the 19th Ordinary Meeting of the Contracting Parties to the Barcelona Convention (COP19) adopted the Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025, as a strategic guiding document for all stakeholders and partners to translate the 2030 Agenda for Sustainable Development (2030 Agenda) at the regional, sub-regional and national levels. The MSSD recognizes climate change as a priority issue for the socio-economic development and environmental sustainability of the Mediterranean and calls for increasing scientific knowledge, raising awareness, and developing technical capacities to progress towards a green, low-carbon and climate-resilient Mediterranean region.

- The Mediterranean Expert Group on Climate and Environmental Change (MedECC) was launched during a side event organized at the Conference 'Our Common Future under Climate Change' (CFCC) in Paris, (France) in July 2015. MedECC is an open and independent network of more than 400 scientists working towards a regional science-policy interface for climatic and other environmental changes across the Mediterranean.

- Mediterranean climate Variability and predictability (MeddCLIVAR) serves as a scientific network to promote better communication among different scientific disciplines and to develop a multidisciplinary vision of the evolution of the Mediterranean climate through studies that integrate atmospheric, marine, and terrestrial climate components at time scales ranging from paleo-reconstructions to future climate scenarios.

- The Foundation Euro-Mediterranean Center on Climate Change (CMCC) is a non-profit research institution established in 2005. CMCC's main mission is to investigate and model the future of our economic and economic systems, with special emphasis on impacts of climate change and related collective actions to address mitigation challenges. https://www.cmcc.it/

- MedWet - Wetlands for a sustainable Mediterranean region (https://medwet.org/). Established in 1991, the Mediterranean Wetlands Initiative brings together 27 Mediterranean and peri-Mediterranean countries that are Parties to the Convention on Wetlands (Ramsar, Iran, 1971). Palestine and a number of organizations and wetland centres are also part of the MedWet Initiative. The different entities of the MedWet Initiative, as established in its Terms of Reference, are: i) The Mediterranean Wetlands Committee, ii) The MedWet Steering Group, iii) The MedWet Scientific and Technical Network, iv) The MedWet Secretariat. The MedWet/STN is working through five Specialist Groups (SGs) in the key areas where there is a need to improve the knowledge and managerial capacity related to wetland conservation and sustainable use. Among the five Key Areas is Climate change: to investigate the implications of climate change for the functioning and management of wetlands and their resources; this group will evaluate the impact of climate change on wetlands and water resources and assess both carbon stocks in Mediterranean wetlands and the role of coastal wetlands in the mitigation of the consequences of rising sea levels.

- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021)
https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

- UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020)
https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf

- UfM Working Group on Blue Economy
https://ufmsecretariat.org/ufm-working-group-blue-economy/

- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects
https://ufmsecretariat.org/what-we-do/water-environment/

Target sectors and groups

Climate change adaptation is a major crosscutting issue requiring increased knowledge, technological and social innovation, as well as policy shifts throughout the EU and the Mediterranean. The Commission has already set out a clear vision for achieving climate neutrality, which includes improving the productivity of aquatic and marine resources, reducing the increasing energy efficiency of the fishing sector and increasing of shore energy production. In addition, adaptation measures for the coastlines and coastal populations should be included in National MSPs. In order to achieve this in the Mediterranean level there is a need for the co-operation of several sectors and Intergovernmental and National Bodies and groups. NGOs are also an important target group, as they have a better contact with the public and most of them have Climate Change issues on their Agenda.

Intergovernmental Bodies

- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en) and MSP Member States Expert Group (MSEG);
- DG Clima (https://ec.europa.eu/clima/index_en);
- UNEP/MAP (http://web.unep.org/unepmap/) and its Regional Centers (e.g. PAP-RAC, SPA-RAC, INFO-RAC, REMPEC);
- Intergovernmental Panel on Climate Change (IPCC) (https://www.ipcc.ch/);
- Major Economies Forum on Energy and Climate (MEF);
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/);
- GFCM (http://www.fao.org/gfcm/en/);
- European Environment Agency (EEA) (https://www.eea.europa.eu/)
- European Topic Center on Inland, Coastal and Marine Waters (ETC/ICM) (https://www.eionet.europa.eu/etcs/etc-icm)
- International Council for the Exploration of the Sea (ICES) (https://www.ices.dk/)
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/);
- International Energy Agency (IEA) (https://www.iea.org/);
- European Council for Maritime Applied R&D (ECMAR, https://www.ecmar.eu).

Sectoral Associations and Technology Platforms

- European MSP Platform: https://www.msp-platform.eu/;
- European Aquaculture Technology and Innovation Platform (http://eatip.eu/);
- European Fisheries Technology Platform (http://eftp.eu/);
- Waterborne Technology Platform (https://www.waterborne.eu/);
- Observatoire Méditerranéen de l'Energie (OME) (http://www.ome.org/);
- European Community Shipowners Association (ECSA) (https://www.ecsa.eu/).

Industries

- Energy Sector;
- Shipping Sector;
- Aquaculture/Fisheries Sector;
- Agriculture Sector;
- Tourist operators;
- Water resources managers.

Funding options and agencies

The EU finances adaptation to climate change in Europe through a wide range of instruments, aligned with the Europe 2020 Strategy towards smart, sustainable and inclusive growth. The Multiannual Financial Framework 2014-2020 will ensure that at least 20% of the European budget is climate-related expenditure (to be approved by the European Parliament). The EU also finances climate change adaptation outside its borders.

https://ufmsecretariat.org/wp-content/uploads/2017/11/UfM-Climate-Finance-Study.pdf

Table 1: Funding to regional projects and their relevant countries in million US dollars (mUSD)

REGIONAL PROJECTS AND THE RELEVANT COUNTRIES INCLUDED[10]		
Regional (Egypt, Jordan, Morocco, Tunisia)	GCF	151,2
Regional (Egypt, Jordan)	GEF (GEF Trust Fund)	4,0
Regional (Africa[11])	GEF (SEFA)	1,2
Regional (Albania, Algeria, Libya, Morocco, Montenegro, Tunisia)	GEF (SCCF)	1,1
Regional (Morocco, Tunisia)	AFD/FFEM	1,1
Global (Mauritania)	GEF (GEF Trust Fund)	0,59

Funds and funding agencies:

- UfM.
- The Interreg IPA CBC Programme "Greece – Albania 2014 – 2020.
- Horizon 2020.
- Life European Project (DGENV) and CEPSA (Private company, Spain) (Life blue Natura).
- Interreg IV B Med.
- European Territorial Cooperation Programme.
- European Climate Change Programme.
- Private Sector/Industries/Enterprises. For example, tools that exist in the Central Banks to motivate companies to adapt environmental policies.

Activities to promote the SRIA Implementation			
Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Participation in Climate – KIC Hub actions. • Participation in MEDECC Events. • Participate and align with next climate change related events. • Private sector/Industries, through motivation by the states/ central banks.	**How:**	• Educational Activities, promotion of innovative ideas, online courses. • Connect Science with industry. • Industry as funders as end users. • Private sector wants concrete ideas to see that something is tangible. • Scenarios on climate change with Blue economy.
		When:	
Alignment and coordination	• BlueMed GSO working group. • MEDECC. • CEN-CENELEC Coordination Group 'Adaptation to Climate Change' (ACC-CG). • The Directorate-General for Climate Action (DG CLIMA). • IPCC. • UfM. • UNEP.	**How:**	• Meetings and activities for the identification of priority topics / actions and of options for joint implementation. Research to strengthen dialogue and institutional capacities. • Targeted research and innovation regarding climate change impact on food webs, biodiversity, marine habitats and therefore on fisheries and aquaculture is a key point (link to fiche 2). • The link between climate change (sea level rise...) and tourism is of priority concern in the region. Addressing these issues will need appropriate observing systems. • Therefore, Infrastructure needs to explore new research topics (more scientific effort)
		When:	• 2019 – 2023
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Advisory Groups. • Research organizations. • Interact.	**How:**	
		When:	
Start-Up actions	• Climate-KIC Start ups. • Mediterranean Climate Change Adaptation Awards".	**How:**	
		When:	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• GSO BLUEMED Working Group. • EU RTD.	**How:**	
		When:	

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Lobbying actions	• Climate Action Network. • Corporate Europe Observatory. • Search new funding opportunities (e.g. philanthropic foundations that could give awards on innovation).	**How:**	
		When:	
Training and capacity building initiatives	• Research organizations. • Specialised schools and master courses.	**How:**	
		When:	
Implementation Working Groups (IWG) on specific sectors	• BLUEMED GSO. • EU Advisory Groups. • UNEP groups. • Research organisations and Universities.	**How:**	
		When:	
Communication and engagement	• GSO BLUEMED Working Group. • EU Advisory Groups. • Research organizations. • Local Authorities. • Non-governmental organizations.	**How:**	• Climate change day similar to researchers' night. • Climate capital of Europe. • Climathon: Propose an activity within Climathon 2020 related to the Med Sea, realised simultaneously in all capitals with the presence of BLUEMED (may be the Ambassadors).
		When:	

FICHE 4

TOWARDS AN OBSERVING SYSTEM OF SYSTEMS

CO-CHAMPION COUNTRIES: FRANCE, MALTA, ALGERIA

Background

Blue Growth demands for a holistic approach, integrating knowledge on oceanic dynamics, ecosystem structuration and functioning, and economy and societal needs. For a complete picture, there is also a strong need for assessing marine and coastal vulnerability and sustainability of ecosystem services. Among the pre-requisites for this approach is the open access to multidisciplinary data, which requires proper support for acquisition of high quality qualified data through the net increase and evolution of ocean observing systems. Therefore, observation is key to provide knowledge and support environmental status assessment while at the same time; it can also stimulate new services and Blue Growth.

However, a number of variables that are known to be important for monitoring of environmental conditions are still not properly observed, and in some cases the technology is not fully developed yet; and when it is developed, in certain cases, it is not accessible to southern countries. Long-term observations with prescribed methodology are available only in few parts of the Mediterranean, even though they are indispensable for a proper assessment of changes occurring in the marine environment, especially in coastal areas, which are deeply affected by current challenges and which concentrate a high proportion of human density and economic activities.

The importance of these challenges has led the United Nations to proclaim a Decade of Ocean Science for Sustainable Development (2021-2030) and to state that scientific understanding of the ocean's responses to pressures and management action is fundamental for sustainable development. Ocean observations and research are also essential to predict the consequences of change, design mitigation and guide adaptation. This strong link between the health of our seas and oceans is critical to the economic, social and environmental well-being has also been emphasized by the Leaders of the G7 at 2018 G7 Summit. In line with this statement, the Future of the Seas and Oceans Working Group has recognized the importance of ocean observing and monitoring activities.

There is therefore 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 to unlock the Med-specific knowledge and innovation potential. In situ and remote observations of the sea are both essential ingredients 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 natural and human disasters as well as to provide other relevant services.

Marine and coastal observation and monitoring systems do not cover all of EcAp's ecological objectives and IMAP indicators, including common indicators related to the biological and ecological component, hydrography and those related to climate change. Significant efforts must be made in order to standardize the internal procedures as well as to make data observation timely visible, accessible and exploitable. A similar effort needs to be made to improve data sharing, especially on digital platforms. Moreover, a truly holistic approach and long-term vision should include both the strengthening of existing observing systems and the design of future augmented observatories that would take advantage of innovative cost effective technologies such as those driving the ongoing "-omics revolution" in biology or the Internet of the Things (IoT).

An interesting win-win scenario is emerging where ocean observations for environmental management, for monitoring the health of the marine ecosystem, and for marine safety and surveillance could also serve, in their non-confidential elements, to feed the research and economic sectors for added value and societal benefits at no additional data acquisition costs. In an evolving knowledge-based society, open access to key technologies, high quality data, modelling and satellite observations, are perceived to be key ingredients to support sustainable blue growth, especially in the coastal areas where many essential economic activities are occurring at the national scale. This goes hand in hand with the process of extracting essence from data, maximising their value by providing a wide range of downstream services that are fitting to the user needs at various scales.

Permanent standardized observatories that can cost effectively measure the variability of the marine ecosystem in all its interconnected components down to the coastal areas can be shaped to serve research, monitoring and industry, supporting the BlueMed challenges. Coordinating the observing system of systems and promoting open data practices, 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. Among them are; the need to improve procedures for the data sharing at the relevant scales. ; the need for data integration because these data are currently being exploited most often with sectoral orientation (fishing, pollution, infrastructures, etc.). ; the need for better development/processing of raw data for optimization of their use. In this context, the content of this fiche and the suggested actions at the end of the document are strongly linked to the work realized in the framework of Fiche 10 on Open Data, Open Science, and Open Innovation.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

The need to facilitate access and exchange of oceanographic information and data has led to the creation of several international initiatives from the scientific community in the field of marine observations (e.g. the Global Ocean Observing System; the IOC's International Oceanographic Data and Information Exchange, born in 1961; the International Ocean Discovery Program, Science Plan 2013-2023; the Global Ocean Ship-Based Hydrographic Investigation Program).

In the framework of the BLUEMED CSA's work, Research Infrastructures have been classified into five categories. Please refer to BLUEMED Deliverable D3.3 for further details. The following paragraphs aim at highlighting the gaps that need to be tackled by the activities that will be implemented by BLUEMED Implementation Plan to tend towards an integrated Observing System of Systems in the Mediterranean.

Research vessels and equipment

There is already a good level of collaboration among European countries with several existing programmes aiming at facilitating access to research vessels for scientists, and improving coordination and networking (EUROFLEETS/ERVO/OFEG). However, there are still big differences in fleet operation mechanisms among countries. Most of the research vessels operating in the Mediterranean Sea are owned by European countries. Moreover, the access to certain areas of the sea is restricted by national jurisdictions due to a lack of political agreements.

Marine based facilities

Several European networks (MonGOOS/EuroGOOS/DANUBIUS-RI) of observing platforms and bi-lateral initiatives (O-LIFE) exist and function efficiently.

A mixture of EU funding projects, INTERREG and ENPI CBC Med and dedicated funds from single countries have enabled the setting up of infrastructures mainly at national and bilateral scales, capacity building and sharing of technologies for marine observations and modelling, including the involvement of non-EU partners (like ODYSSEA).

At French level, the Infrastructure for Coastal and Littoral Research (IR-ILICO) can be an example of a successful project aiming at gathering eight different observation networks and services to better understand coastal ecosystems, which are deeply affected by climate change and which concentrate a high proportion of human economic activities. At European level, JERICO-NEXT aims at creating a strong network of European research infrastructures dedicated to coastal observation. This project aims at encouraging the harmonization of methods and tools in the domain to obtain joint measures and quality data at European scale. The involvement and participation of non-EU countries to this type of initiatives must be encouraged and strengthened.

Collaboration between the private sector and the scientific community can be improved to ensure long-term series of observations and data sharing.

Studying new contaminants, new cumulative impact of contamination and new sources of pollution requires the reuse of essential ocean variables (initially collected for other purposes). This new uses of "ancient" data must requires precaution considering "original" objectives and conditions of sampling and measuring.

There is still a restricted integration of modelling facilities into observational networks.

Further multi-purposes offshore platforms could be developed. For example, the implantation of three pilot floating offshore windfarms in the Gulf of Lion (from 2021) could be an opportunity to establish permanent and high frequency observatories.

Land based facilities

Land based facilities are already well organized in Europe, and secured by the ESFRI label in some cases (EMBRC-ERIC). However, there is a lack of laboratories in the South, and scientists may have to go far away from home to access RIs. This difficulty can be compounded by visa issues and southern scientists sometimes encounter difficulties to visit labs in the North shore. Moreover, there is a lack of visibility and awareness on RIs opportunities and services. For example, regarding European RIs, 20% of TNA is made accessible to southern countries, but most of the time, this is ignored. However, there is still need for optimising existing RI's in southern Mediterranean countries. Scientific collaboration and cooperation is still strongly oriented north-south and the need for south-south scientific collaboration and cooperation is one of the keys for the optimization of southern RI's.

The quantity of emerging pollutants and new contaminants is increasing, and there is a lack of knowledge about them, about their impacts, their evolution and there is a lack of land-based facilities specifically dedicated to this kind of studies.

Moreover, there is lack of awareness on climate change in the southern shore, this topic is not always considered as a research priority. Work should be done to encourage the development of facilities and studies on topics related to climate change such as erosion and coastal risks.

Satellites and spatial data

Several European programmes already exist (e.g. Copernicus/ORFEO/SPOT/EUMETSTAT Polar System/Earth Explorer ESA programmes) but difficulties for the south eastern Med countries to access these services are unresolved. The exploitation of Earth Observations into added value applicative services is a lucrative challenge especially with the advent of important satellite platforms such as the Sentinel constellation. Merging of satellite data to numerical models and in situ observations are the essence of operational oceanography targeting to serve a range of users (institutional, public and private) and providing the data backbone for research, environmental assessments, security and surveillance as well as the marine economic sector.

Data

Several well structured mechanisms exist in Europe (such as EMODnet/Copernicus/ SeaDataNet), where the culture of data sharing is relatively well spread. The quest to make data access open and widespread is the challenge of COPERNICUS Programme. While the access of essential regional scale data is supported by the EC through COPERNICUS, a framework to enhance national scale observing systems in the coastal areas is necessary, aiming to create COPERNICUS-like systems at country scale under a common system of systems linking to the mother COPERNICUS service.

Moreover, interactions between the scientific community and the private sector needs to be reinforced in order to access and reuse data collected by the private sector and vice-versa.

The sharing of data between the two shores of the Mediterranean, and the quantity and quality of data is not homogeneous in the whole basin (lack of data coverage and absence of data sharing culture in the southern shore). Work should be done to encourage political commitments to enable the harmonization of data standards and interoperability between the two shores.

Alongside these large-scale programmes, which benefit from strong institutional support, many project exist at a smaller scale, ran by various types of stakeholders (public bodies, private companies, NGOs) and including acquisition of data that can valuable for the assessment of the status of the marine ecosystem.

PROJECT	DESCRIPTION		OBJETIVES
EUROFLEETS+ An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities	**Call** H2020 **Duration:** 01 February 2019 – 31 January 2023	**EU Contribution**: € 9,999, 360.58 **Website:** https://www.eurofleets.eu	Integrating and opening existing national and regional research infrastructures of European interest. EUROFLEETS+ prioritises support for research on sustainable, clean and healthy oceans, linking with existing ocean observation infrastructures, and supports innovation through working closely with industry. The project will enable access to a unique fleet of 27 state-of-the-art research vessels from European and international partners.
ILICO French seashore and coastal research infrastructure	**Website:** https://www.ir-ilico.fr/en		The French seashore and coastal research infrastructure ILICO (Infrastructure de Recherche Littorale et Côtière) was established in 2016 with the support of Ministry of Higher Education, Research and Innovation. ILICO is a notable example of national infrastructure and interinstitutional efforts to observe and understand coastal and ocean environments and ecosystems as a whole. ILICO brings together observation mechanisms involving the collection of samples and the deployment of various measuring instruments. Long-term monitoring allows for the understanding and prediction of large-scale coastal processes and phenomena which can impact on coastal and littoral zones (for example quantifying the impact of specific extreme or intermittent events such as tsunamis or cyclones).
JERICO-NEXT Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observatories	**Call:** H2020-EU.1.4.1.2. **Duration:** 01/09/2015 - 31/09/2019	**EU Contribution:** 9.998.876,47 € **Website:** http://www.jerico-ri.eu/	The objective of JERICO-NEXT consists in strengthening and enlarging a solid and transparent European network in providing operational services for the timely, continuous and sustainable delivery of high quality environmental data and information products related to marine environment in European coastal seas. It includes an enable free and open access to data, enhance the readiness of new observing platform networks by increasing the performance of sensors, showcase of the adequacy of the so-developed observing technologies and strategies.

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL STRATEGIES AND PROGRAMMES

- **Global Ocean Observing System (GOOS)** is a programme executed by the Intergovernmental Oceanographic Commission (IOC) of the UNESCO, providing a sustained collaborative system of ocean observations, encompassing in situ networks, satellite systems, governments, UN agencies and individual scientists. It includes a multinational Steering Committee to provide oversight, scientific Expert Panels to guide system requirements, and Observation Coordination Groups that implement global unified network execution. The GOOS Project Office facilitates the collaboration between these different governance bodies.

- **International Oceanographic Data and Information exchange**: since 1961, facilitating the exchange of oceanographic data and information between participating MS, and by meeting the needs of users for data and information products. It:

  - Facilitates & promotes discovery, exchange and access to marine data;
  - Encourages long term archival preservation documentation management and services of marine data;
  - Develops or uses existing best practices for the discovery, management, exchange of, and access to marine data and information;
  - Assists MS to acquire the necessary capacity to manage marine research and observation data and information;

- **Global Ocean Ship-Based Hydrographic Investigation Program**: Joint WMO-IOC Technical commission for oceanography and marine meteorology – brings together scientists with common interests in physical oceanography, carbon cycle, marine biogeochemistry and ecosystems and other users and collectors of hydrographic data to develop a globally coordinated network of sustained hydrographic sections as part of the global ocean/climate observing system. JCOMM coordinates, develops and recommends standards of procedures for a fully integrated marine observing, data management and service system.

- **International Ocean Discovery Program, Science Plan 2013-2023:** International marine research collaboration to explore Earth's history and dynamics using ocean-going research platforms to recover data recorded in seafloor sediments and rocks and to monitor subsea floor environments.

EUROPEAN STRATEGIES AND PROGRAMMES

- **Copernicus Marine Environment Monitoring System 2015-2025** –COPERNICUS Programme includes a Space Component and several Thematic Services, among which the Marine Environment Monitoring Service (CMEMS). Information from satellites and in situ observation are used for daily analyses and forecasts of the state of ocean and sea. COPERNICUS Programme also comprises the deployment of Data and Information Access Services (DIAS), namely cloud-based platforms providing centralised access to COPERNICUS data and information, also including processing tools.

- **JPI Oceans** – aims at aligning efforts and funding in marine research between MS and associated countries through joint calls. 'Observing, modelling and predicting oceans state and processes' is one of its priorities.

Target sectors and groups

Key marine observations are needed by different users and stakeholders for research, monitoring and industry.

The target is to observe the sea to better understand the complex marine ecosystem and its functioning (research), to measure and assess its evolution under different stressors and manage resources sustainably (monitoring and management), to provide essential information for decision making and to identify risks and alert hazards (surveillance, security and policy), and to create win-win situations for the use of the same data by economic operators by providing the data backbone needed for a knowledge-based marine economic sector, supplying the data driven services, and promoting smart, innovative added value products to boost blue growth.

Moreover, the understanding and preservation of marine ecosystems concern all sectors and stakeholders whose activities take place in the Mediterranean Sea and it seems important to involve them more closely in observation activities.

It is also necessary to reach out to the non-EU Mediterranean countries: to promote the use of existing data sources; to support the uptake and sharing of new technologies; to participate in the joint monitoring of the marine environment, and to share the commitment for sustainable development.

Intergovernmental Bodies

- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en).
- UNEP/MAP (http://web.unep.org/unepmap/) and its Regional Centers (e.g. PAP-RAC, SPA-RAC, INFO-RAC, REMPEC).
- IOC-UNESCO (http://msp.ioc-unesco.org/).
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- GFCM (http://www.fao.org/gfcm/en/).

Maritime Clusters

- European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
- Pole Mer Mediterranee (https://www.polemermediterranee.com/).

NGOs

- WWF MED (http://mediterranean.panda.org/).
- MEDPAN (https://medpan.org/).
- IUCN Mediterranean (https://www.iucn.org/).

Private companies

Collaboration possible with very diverse economic sectors which lead their activities in the Mediterranean Sea (fisheries, ferry companies, energy companies and MREs platforms, shipping companies).

Funding options and agencies

European funding:

- **CMEMS** – Copernicus Marine Environment Monitoring Service.
- **Horizon 2020** – especially under Pillar 1 'Excellent Science' with Research Infrastructures' thematic and under Pillar 3 'Societal Challenges' with the 'food security, sustainable agriculture, marine and maritime research and the bio-economy' thematic.

- **Horizon Europe** – in particular under Pillar 1 'Research Infrastructures' ; Pillar 2 'Global challenges and Industrial Competitiveness' – Cluster 'Food and natural resources', and within the Mission 'Healthy Oceans, Seas, Coastal and Inland Waters'.
- **Union for the Mediterranean**.
- **UNEP/MAP**.
- **JPI Oceans**.
- Private foundations.
- Competent ministries and regional/local authorities through specific calls.
- Maritime cluster:
  - European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
  - Pole Mer Mediterranee (https://www.polemermediterranee.com/).

Activities to promote the SRIA Implementation			
Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Encourage economic sector, private stakeholders, NGOs, MPAs, citizen science projects, to be involved in the collection of marine and coastal data. All those observation efforts made by the diverse stakeholders involved in Blue Growth activities need to be coordinated through common methodology and shared guidelines. • Goal: strengthen synergies between research, economic and other maritime actors, promote the adoption of open data practices. • Ensure support and funding of observing systems on the long term	**How:**	• Mediterranean Programme in collaboration with fisheries to collect data during fishing trips; • Annual Mediterranean Conference dedicated to marine and coastal observation – gathering all the different sectors mentioned in the adjacent column; • Encouragement of FerryBox-like projects, establishment of new routes and involvement of new companies.
		When:	1) 2020-2023. 2) One conference per year, starting 2021. 3) 2020-2023.
Alignment and coordination	• Alignment and coordination with EUROFLEETS+ on the way to develop a dedicated programme to the Mediterranean Sea, with a specific MedEUROFLEETS Plan of Action; • Alignment and coordination with Copernicus Programme, promotion of Copernicus model with non-EU countries; • Alignment and coordination with ESFRI.	**How:**	Meetings and activities for the identification of priority topics/actions and of options for joint implementation. Research to strengthen dialogue and institution capacities.
		When:	2020 – 2023.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Develop transnational joint observing systems, through a network of marine based facilities and multidisciplinary stations able to address environmental threats and pollution, and related hazards (...). Target: monitor and understand ecosystem changes, improving alerts and anticipate risks (marine food chain disruptions, impact from pollution, contaminants...). • Promote the adoption of open data practices.	**How:**	International networking; dedicated assessments to quantify and locate non-local sources of pollution; study connective pathways of pollutants.
		When:	2020-2023.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Start-Up actions	N/A	**How:**	N/A
		When:	N/A
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	Importance to define what we want to observe and to use observation as a tool to achieve and implement other BLUEMED thematic goals identified as priorities (pollution, climate change, seafood, tourism, greening transports).	**How:**	
		When:	
Lobbying actions	Actions to highlight the importance of marine and coastal observation within the Horizon Europe Mission of Healthy Oceans, Seas, Coastal and Inland Waters, and to promote dedicated calls.	**How:**	Dedicated meetings and participation to relevant working groups.
		When:	2020-2023.
Training and capacity building initiatives	• Importance to better observe land sea (river inputs, sediment fluxes, pollutants) and atmospheric interfaces; • Connect observation of physical and biochemical parameters to biodiversity observations.	**How:**	Programme to develop common modelling tools between land and sea. Develop trainings to teach young scientists how to use them.
		When:	Starting end of 2021.
Implementation Working Groups (IWG) on specific sectors	Set up a regional task force composed of experts and relocatable observing system components to services and assist bordering countries with expertise and infrastructure to be deployed for dedicated joint activities.	**How:**	• Define laboratories of reference and bring them together on key specific domains of activity; • Set-up a coordinated network of coastal multidisciplinary observing stations • Reinforce the access to land-based facilities and strengthen TNA calls (especially by facilitating their access for non-EU scientists).
		When:	
Communication and engagement	Organization of a Mediterranean Conference dedicated to marine and coastal observation (already mentioned above).	**How:**	Conference.
		When:	One conference per year, starting 2021.

FICHE 5
LINKING TOURISM, TOURISTS AND ENVIRONMENT
CO-CHAMPION COUNTRIES: CYPRUS & TUNISIA

Background

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 reflects a millenary history.

The climate of the area is favorable to the exercise of tourist activities throughout the year. Touristic economy is therefore of high importance for many countries. As income generator tourism also provides a valuable income for supporting preservation and conservation of natural as well as cultural heritage.

However, tourism often exerts high pressures on the coastal and marine environment, especially during seasons of high visitation, when the population of some areas increases by threefold or more (for example, Slovenia, Malta). Increased number of daily users (tourists and locals) led to high pressure on natural and cultural assets, causing abuse and destruction of those resources. In many cases, countries depend on the import of essential resources for accommodating typical tourist needs (e.g. food, drinks, energy, etc.) which significantly reduces economic benefits of tourism, while maintaining high pressure on natural and cultural resources.

By providing incomes and jobs to the local population, this sector is also considered as strategic by many coastal regions. However, tourism often exerts high pressures on the coastal and marine environment, especially during seasons of affluence when the population of some areas increases dramatically.

Thus, reducing negative impacts of tourism on natural, social and economic environment will allow for preserving the natural and cultural heritage on the long term. This priority supports the implementation of the "European Strategy on sustainable tourism for blue job in Maritime and Coastal 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. pescatourism) or with the inland can be of great potential.

Very interesting prospects are also offered in this sector by the fast development of ICT. This makes possible to experiment innovation in a very short term as well as provide infrastructure for monitoring tourism's impacts; thus allowing the empirically supported decisions making for tourism sector.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJECTIVES
ALTER ECO Alternative tourist strategies to enhance the local sustainable development of tourism by promoting Mediterranean identity	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/07/2019	**EU Contribution:** 2.293.630.00 € **Website:** https://alter-eco.interreg-med.eu	The Mediterranean is under threat due to the inappropriate practice and development associated with mass tourism. As a consequence areas of high tourist attraction in coastal cities are reaching their limit on carrying capacity, with a direct impact not only on the urban environment but on key elements that define MED Culture. In this context, ALTER ECO enhances the local sustainable development of tourism by promoting Mediterranean Identity through the implementation of alternative tourist strategies in 6 pilots co-designed and implemented by public and private stakeholders.

			The project provides the opportunity of testing, in representative MED cities, used as LIVING LAB, existing methodologies and tools arisen in previous high impact projects in the field of sustainable tourism or proposed by key stakeholders, with the aim of reaching holistic and realistic tourist strategies at local and regional level that allow transferability in the MED territory. Project results will support policy makers to make more informed and integrated decisions for the governance and management of tourism in the Mediterranean and at the same time will enhance the coordination of actions between public and private stakeholders towards the implementation of the raised strategies in order to create new business opportunities.
BLUEISLANDS Seasonal variation of waste as effect of tourism	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.755.320,41 € **Website:** https://blueislands.interreg-med.eu	Blue Islands Project brings together 14 partners from 8 countries in a systematic effort to properly identify, address and mitigate the effects of the seasonal variation of waste generation on MED islands as an effect of tourism. The issue has been a vexing problem for years but it has never before been approached methodically: The quantity and composition of waste generated over a twelve-month period on nine MED islands will be measured and the correlation between the quantified waste generated and both the number of tourists and the presence of litter in the coastal environment will be examined. At the same time, the existing waste management structure and followed respective practices will be assessed.
BLUEMED	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/01/2020	**EU Contribution:** 2.797.549.00 € **Website:** https://bluemed.interreg-med.eu	Aims to plan/test/coordinate Underwater Museums, Diving Parks and Knowledge Awareness Centres in order to support sustainable and responsible tourism development and promote Blue growth in coastal areas and islands of the Mediterranean.
CASTWATER Coastal areas sustainable tourism water management in the Mediterranean	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.238.116,60€ **Website:** https://castwater.interreg-med.eu	CASTWATER is the first MED project to support sustainable tourism policies & practices on water efficiency in coastal areas. The transnational challenge is to reduce the impact of tourism activities on environmental heritage and to improve management of water resources. The project's overall objective is to support sustainable tourism water management in Med coastal areas, by improving the monitoring and assessment of the water sustainability performance of the tourism sector.

COASTING: Coastal INtegrated Governance for Sustainable Tourism Lead Partner: Andalusian Federation of Towns and Provinces	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2018 – 31/07/2019	**EU Contribution:** 1.054.612,50€ **Website:** https://coasting.interreg-med.eu	COASTING is a capitalisation project based on the ICZM principles application, aiming at enhancing the effectiveness of a multilevel governance tool like Coast Contract, fully framing coastal management and tourism sustainability issues. COASTING transnational partnership will activate synergies and cooperation to share specific solutions for an integrated and responsible management of coastal areas, particularly invested by tourism criticalities.
CO-EVOLVE Promoting the co-evolution of human activities and natural systems for the development of sustainable coastal and maritime tourism	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 3.000. 000,00€ **Website:** https://co-evolve.interreg-med.eu	CO-EVOLVE aims at analyzing and promoting the co-evolution of human activities and natural systems in touristic coastal areas, allowing sustainable development of touristic activities based on the principles of ICZM/MSP. CO-EVOLVE couples a presently unavailable analysis at MED scale of threats and enabling factors for sustainable tourism with local studies on representative Pilot Areas, to demonstrate through pilot actions the feasibility and effectiveness of a ICZM/MSP-based planning process.
CONSUME-LESS Consume Less in Mediterranean Touristic Communities	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.635.000€ **Website:** https://consume-less.interreg-med.eu	The CONSUME-LESS project faces this issue by demonstrating the effectiveness of a sustainable tourism model based on the qualification of the coastal cities as "consume-less" locations and on the enhancement of this peculiarity through an innovative communication and territorial marketing campaign, both implemented by directly involving all interested actors (local authorities, tourism operators and service providers, tourists). This will bring multiple benefits, which will be carefully monitored and accounted for through the use of a suitable set of indicators, based on the European Tourism Indicators System.
DESTIMED	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.500.000 € **Website:** https://destimed.interreg-med.eu	Mediterranean Ecotourism Destination: main components (joint planning, monitoring, management and promotion) for a governance system in Mediterranean protected areas.

EMbleMatiC Emblematic Mediterranean Mountains as Coastal destinations of excellence	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.975.571,49€ **Website:** https://emblematic.interreg-med.eu	The objective of the EMbleMatiC project is to create and test a new and radically different tourism offer based on the features of these mountains and to create an alternative to the traditional holiday on the beach. This project goes even further. It is not concerned with creating a generic tourism product, but rather with piloting a new way of conceiving tourism: one which combines the development and protection of natural environments, by applying a more sustainable and responsible management of tourism flows and a greater involvement of inhabitants and local actors.
HERIT-DATA Sustainable Heritage Management towards Mass Tourism Impact thanks to a holistic use of Big and Open Data	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2018 - 31/01/2022	**EU Contribution:** 4.195.515,20€ **Website:** https://herit-data.interreg-med.eu	HERIT-DATA plans to develop of a sustainable and responsible tourism management towards cultural heritage in MED regions, in particular by taking advantage of technology and innovation in management tools (Smart Cities), as well as other policy and social measures. The partners will develop, test and transfer a series of knowledge and solutions (Models, Strategy, Artificial Intelligence & Big Data based-on platform and App, etc.) in line with the current sectoral changes and characteristics of smart destinations, able to collect, generate, integrate and analyse information and transform it into behaviour changes, according to ICZM recommendations.
INHERIT Sustainable tourism strategies to conserve and valorise the Mediterranean coastal and maritime natural heritage	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2018 - 31/01/2022	**EU Contribution:** 5.612.660,00 € **Website:** https://inherit.interreg-med.eu	INHERIT will promote sustainable tourism alleviating seasonality and tackling the surpassing of the hosting capacity, by designing and implementing a "bottom-up" protection approach relying on self-regulation and monitoring by local society and tourism stakeholders. The INHERIT protection approach will involve all the key stakeholders (at MED, national, regional and local level) in its studying, testing and capitalisation activities, to deliver: - A MED-wide policy strategy and protection measures addressing the negative effects of intensive tourism flows.

MEDCYCLETOUR MEDiteranean CYcle route for sustainable coastal TOURism	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2017 - 31/01/2020	**EU Contribution:** 2.578. 131,89 € **Website:** https://medcycletour.interreg-med.eu	Sparkling emerald seas, kilometers of golden sand, wonderful food and ancient cities...it's not hard to find reasons to go cycling along the Mediterranean! Unfortunately, in the 8 countries covered by this project, the potential of cycling tourism has not yet been realised even though it prolongs the tourism season, reduces the environmental impact of travelling and can bring tourists to less visited areas. EuroVelo 8 – Mediterranean Route is a long-distance cycle route that connects the whole Mediterranean from Cyprus to Cádiz. The overall objective of the project is to use this route as a tool to influence regional and national policies in favour of sustainable and responsible tourism, providing transnational solutions in coastal areas across the Mediterranean.
MEDFEST MED Culinary heritage experiences: how to create sustainable tourist destinations	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 31/10/2019	**EU Contribution:** 2.218.473,66 € **Website:** https://medfest.interreg-med.eu	MEDFEST is tackling the challenge of diversifying traditional 'sun & sea' tourist destinations, with new and sustainable products based on rich and renowned culinary heritage of the Mediterranean. In so doing, we will increase the sustainability and quality of life in MED space. Our objective is to create tools and instruments for designing new sustainable culinary experiences, which will be offered to visitors to: 1) diversify the tourism sector in terms of products and its seasonality; 2) bring tourism development to the coastal hinterland; 3) safeguard culinary heritage for future generations.
MITOMED+ MITOMED+ Models of Integrated Tourism in the MEDiterranean Plus	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2017 - 31/01/2020	**EU Contribution:** 2.650.000,00€ **Website:** https://mitomed-plus.interreg-med.eu	MITOMED+ is multi-module project combining Testing and Capitalization (M2+M3). It is a follow up of the previous MITOMED project (MED Maritime), which has been working to promote the integrated management of M&C tourism by improving the knowledge of data, products, services through a set of indicators based on the NECSTouR model. MITOMED+ takes farther these results aiming to improve the coordination of strategies between territories at transnational level regarding the development of the M&C tourism through cooperation and joint planning between regions.

ShapeTourism New shape and drives for the tourism sector: supporting decision, integrating plans and ensuring sustainability	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 30/04/2018	**EU Contribution:** 598.536,50€ **Website:** https://shapetourism.interreg-med.eu	Shapetourism improves the tourism knowledge framework, providing analysis and operational tools to pinpoint an integrated methodology to shape and drive tourism sustainable growth, particularly for Cultural Destinations. It supports policymakers and private operators to achieve: attractiveness, growth and sustainability, taking into account the major challenges of global competition. Starting from the capitalization of scientific studies and from tourism established patterns, the project gears towards the balance between divergent public and private interests with the final scope to drive tourism development to a holistic, highly operational and sustainable approach.
SIROCCO Sustainable InterRegional cOastal & Cruise maritime tourism though COoperation and joint planning	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/11/2016 - 30/04/2018	**EU Contribution:** 600.000,00 € **Website:** https://sirocco.interreg-med.eu	Addressing this challenge is hindered by three factors:1) existing knowledge is insufficient & data gaps still exist;2) coastal regions struggle to fully capture benefits generated by cruise tourism; 3) coordination of strategies and policies at regional & transnational level is limited. SIROCCO has the ambition of tackling those problems by providing: 1. An integrated view of the current state of Mediterranean cruise tourism (as a whole and per segment) and its impacts (environmental, economic, and societal). 2. A foresight of Mediterranean cruise tourism for the following decades. 3. Evidence-based, transferable recommendations on developing sustainable & responsible Cruise Value Chains in the MED . 4. Coordinated strategies & policies at regional and transnational level regarding the development of a sustainable and responsible cruise maritime/coastal tourism.
TOURISMED	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/02/2017 - 31/07/2019	**EU Contribution:** 2.157.900,00 € **Website:** https://tourismed.interreg-med.eu	TOURISMED is a project aimed at testing and transferring a fishing tourism business model in the coastal territories of Italy, Cyprus, Greece, Albania, France and Spain as a way to promote a sustainable approach to tourism, while fostering the preservation of the marine ecosystem and the traditional fishing culture of the MED region.
SECNET Cross-border institutional cooperation for the improvement of port security	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/10/2017 - 31/03/2019	**EU Contribution:** 6.996.032,25€ **Website:** https://www.ita-slo.eu/en/secnet	SECNET aimed at improving the institutional competence of the Program Area's ports and to lay the groundwork for coordinated and permanent port security at the cross-border level thanks to the use of innovative ICT tools.

Riviera4seasons2	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/10/2017 - 30/09/2019	**EU Contribution:** 714.174,25€ **Website:** -	Riviera4seasons2 aimed at improving cultural tourism experiences in the Adriatic region.
QNeST: Quality Network on Sustainable Tourism	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/01/2018 - 31/12/2019	**EU Contribution:** 1.465.662,95€ **Website:** -	QNeST aimed at promoting and fulfilling the economic potential of the common and exceptional features of the cultural, traditional and environmental heritage of the Adriatic-Ionian area.
Tourism 4.0	**Call:** ERDF (European Regional Development Fund) **Duration:** 01/09/2018 - 01/10/2021	**EU Contribution: -** **Website:** https://tourism4-0.org/	Tourism 4.0: enriched tourism experiences, aims at developing ICT platform for monitoring tourism impacts and developing empirical support for strategic and business decision making in tourism.
Face to Face: Meet an Ancient Cypriot	**Call:** INTEGRATED/0916/0029 / **Duration:** 01/05/2019 - 01/05/2022	**EU Contribution:** 999.998,17 € **Website:** -	
ReCult - Religious Cultural Pathways	**Call:** Interreg/Greece-Cyprus Integrated Project **Duration:** 01/10/2018 - 01/10/2021	**EU Contribution:** 1.918.370,00 € **Website:** -	
Ecotourism New Knowledge by Innovation, New Jobs by Knowledge Transfer (ECOTOUR)	**Call:** European Project Leonardo da Vinci (LdV) **Duration:** 01/08/2012 - 01/09/2013	**EU Contribution:** 210.880,00 € **Website:** -	The project aimed to improve the skills and competences of people in the tourism sector by introducing an ecotourism training programme in Cyprus, Estonia, Lithuania and Spain, while at the same time encouraging ecotourism development in project countries in particular and Europe in general.

Programmes and initiatives of relevance, including research and data infrastructures

EUROPEAN STRATEGIES

"COSME":

COSME is the EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (SMEs). It supports SMEs in four areas:

- Facilitate access to finance for SMEs through the "Loan Guarantee Facility" and the "Equity Facility for Growth".
- Improving access to markets (notably thanks to the services provided by the Enterprise Europe Network).
- Improving framework conditions for the competitiveness and sustainability of Union enterprises, notably thanks to the Tourism Action Plan.
- Promoting entrepreneurship and entrepreneurial culture, notably thanks to the Erasmus for young entrepreneurs' exchange scheme.

"Creative Europe Programme":

The Creative Europe programme helps cultural and creative organisations to operate transnationally, the circulation of works of culture as well as the mobility of cultural players. Bringing together 3 pre-existing programmes (Culture, MEDIA and MEDIA Mundus), "Creative Europe" is made of 3 parts:

- The "Culture sub-programme" for cultural & creative sectors.
- The "Media sub-programme" for the audio-visual industries71.
- The Cross-sectoral strand for joint projects between the cultural & creative sectors and the audio-visual industries.

"Erasmus+":

"Erasmus+" aims to boost skills and employability, as well as modernising Education and Training. In addition to the new sport action and the Youth in Action programme, it brings together 6 other pre-existing programmes:

- the Lifelong Learning Programme (Erasmus, Leonardo da Vinci, Comenius and Grundtvig)
- Erasmus Mundus, Tempus, Alfa, Edulink and the programme for cooperation with industrialised countries

EaSI programme:

The "Employment and Social Innovation" (EaSI) programme promotes a high level of quality and sustainable employment, guaranteeing adequate and decent social protection, combating social exclusion and poverty, and improving working conditions. It brings together:

- PROGRESS (Programme for Employment and Social Solidarity).
- EURES (European job mobility).
- EaSI Guarantee Financial Instrument (dedicated to microfinance and social entrepreneurship finance).

For details on its structure & procedures, see EaSI website and brochure.

European Fund for Strategic Investments

The European Fund for Strategic Investments (EFSI) is an initiative launched jointly by the European Commission and the EIB Group (European Investment Bank and European Investment Fund) to help overcome the current investment gap in the EU by mobilising private financing for strategic investments.

EFSIO may support, among other things:

- Strategic infrastructure including digital, transport and energy.
- Education, research, development and innovation.
- Expansion of renewable energy and resource efficiency.
- Support for smaller businesses and midcap companies.

European Regional Development Fund

The European Regional Development Fund (ERDF) is one of the five "European Structural and Investment Funds" (ESIF). Under ESIF rules, each Member State has to draw up a strategic plan indicating its 2014-2020 objectives & investment priorities for the use of these Funds. Once the European Commission's observations adequately considered, this plan becomes a "Partnership Agreement". Member States also have to draw up "Operational Programmes" breaking down priorities listed in the Partnership Agreement into concrete actions. "Operational Programmes" (OP) are implemented by Managing Authorities set up by the Member States (at national, regional or another level). The ERDF aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. It may provide essential support to improve the competitiveness and quality of tourism at regional and local levels, notably in areas in (industrial / rural) decline or those undergoing urban regeneration.

ERDF support may go to 11 "thematic objectives and investment priorities" in line with the Europe 2020 policy priorities. The most relevant for the tourism sector probably are:

- Research and innovation (N°1).
- Information and Communication Technologies (N°2).
- Competitiveness of Small and Medium-Sized Enterprises (N°3).
- Shift to a low-carbon economy (N°4).
- Environmental protection and resource efficiency (N°6).
- Employment and support for labour mobility (N°8).
- Education, skills and lifelong learning (N°10).

Cohesion Fund

The Cohesion Fund (CF) is one of the five "European Structural and Investment Funds" (ESIF). Under ESIF rules, each Member State has to draw up a strategic plan indicating its 2014-2020 objectives investment priorities for the use of these Funds. Once the European Commission's observations adequately taken into account, this plan becomes a "Partnership Agreement". Member States also have to draw up "Operational Programmes" breaking down priorities listed in the Partnership Agreement into concrete actions. "Operational Programmes" (OP) are implemented by Managing Authorities set up by the Member States (at national, regional or another level). In order to reduce economic and social disparities and to promote sustainable development, the Cohesion Fund is aimed at Member States whose Gross National Income (GNI) per inhabitant is less than 90 % of the EU average. According to the investment and infrastructure needs specific to each Member, the CF may support Investment in the environment, including areas related to sustainable development and energy which present environmental benefits.

European Social Fund

The European Social Fund (ESF) is one of the five "European Structural and Investment Funds" (ESIF). Under ESIF rules, each Member State has to draw up a strategic plan indicating its 2014-2020 objectives investment priorities for the use of these Funds. Once the European Commission's observations adequately taken into account, this plan becomes a "Partnership Agreement". Member States also have to draw up "Operational Programmes" (OP) breaking down priorities listed in the Partnership Agreement into concrete actions. These OPs can cover entire Member States and/or regions or be cooperation programmes involving more than one country. "Operational Programmes" are implemented by Managing Authorities set up by the Member States (at national, regional or another level). The ESF aims in particular to improve employment and (workers) mobility as well as the level of professional qualifications in the EU.

EAFRD

The "European Agriculture Fund for Rural Development" (EAFRD) aims, among other things, at promoting economic development in rural areas. Funds for rural development are allocated by Managing Authorities appointed by the Member States. Depending on the needs and choices of each Member State, support may be granted to:

- The diversification of farmers into non-agricultural activities.
- The development of non-agricultural SMEs in rural areas and engaged in sustainable.
- Responsible tourism.
- The restoration / upgrading of the cultural and natural heritage of villages and rural landscapes

EMFF

Replacing the European Fisheries Fund, the European Maritime and Fisheries Fund (EMFF) has among its priorities to increase employment and territorial cohesion in coastal and inland communities depending on fishing and aquaculture. This should be achieved by:

The promotion of economic growth, social inclusion, creation of jobs and supporting labour mobility in these communities; the diversification of activities within fisheries and into other sectors of maritime economy.

Each Member State is allocated a share of the total Fund budget in relation with the size of its fishing industry. It then draws up an "Operational Programme", saying how it intends to spend the money. Once the programme approved by the Commission, it is up to the Managing Authority set up by each Member State (at national or regional) to implement it.

Managing authorities responsible for the implementation of EMFF operational programmes delegate a number of tasks to "Fisheries Local Action Groups" (FLAGs). These partnerships between fisheries actors and other local private/public stakeholders design local development strategies. FLAGs also manage a budget to support technically and financially the implementation of their local strategy via specific projects.

Under these local strategies, funding is available in particular for cultural fisheries and maritime cultural heritage. This can cover tourism-related projects, such as eco-tourism, pesca-tourism and fishing tourism33, local gastronomy (fish and seafood restaurants), accommodation, tourist trails, diving, etc.

"**LIFE**"

LIFE is the financial instrument supporting environmental and nature conservation projects throughout the EU. The priority areas of its sub-programme for environment are:

- Environment and Resource Efficiency.
- Nature and Biodiversity.
- Environmental Governance and Information.

The priorities areas of its sub-programme for climate action are:

- Climate Change Mitigation (contributing to reduce greenhouse gas emissions).
- Climate Change Adaptation (contributing to increase resilience to climate change).
- Climate Governance and Information.

"Horizon 2020"

Bringing together three previous programmes / initiatives, "Horizon 2020" is the EU Framework Programme for Research and Innovation (2014-2020). It is made of "programme sections" (also called "pillars"), some being divided in sub-sections. The most interesting sections for tourism probably are:

"Excellent Science"

Sub-section MSCA ("Marie Skłodowska-Curie Actions") for career development and training of researchers – with a focus on innovation skills – in all scientific disciplines through worldwide and cross-sector mobility

"Industrial Leadership"

Sub-section programme LEIT ("Leadership in Enabling and Industrial Technologies"), among other things, for greater competitiveness of the European cultural and creative sectors by stimulating ICT innovation in SMEs Technologies.

"Societal Challenges"

Sub-section programme "Europe in a changing world - Inclusive, innovative and reflective societies", hereafter Reflective, to address in particular the issues of memories, identities, tolerance and cultural heritage.

"SME instrument"

For high-potential SMEs to develop ground-breaking innovative products, services or processes able to face global market competition.

The 'Cyprus Breakfast' programme

The 'Cyprus Breakfast' programme was created by the Cyprus Tourism Organisation (CTO), the Travel Foundation UK and the Cyprus Sustainable Tourism Initiative (CSTI) through the Cyprus Destination Partnership programme. The aim of the programme is to promote local gastronomy and enhance authenticity in the hotels in Cyprus. The hotels through the use of local products highlight the flavours and aromas of Cyprus and invite their guests to experience our gastronomic richness and hospitality.

UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021)
https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020)
https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf

UfM Working Group on Blue Economy
https://ufmsecretariat.org/ufm-working-group-blue-economy/

Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects

https://ufmsecretariat.org/what-we-do/water-environment/

Target sectors and groups

Key target groups are tourism directly and indirectly related organizations from public and private sector. As in figure 1, BlueMed initiative must address the needs and facilitate the capacity of the tourism ecosystem. To do so, by far most important action is to set up a credible and effective system for monitoring tourism's impacts (both positive and negative) and correlate the impacts with tourism target segments as well as with the carrying capacity of local environment as well as key stakeholders. Based on empirically proven tourism impacts key tactic and strategic action may be developed which will support the blue growth in the Mediterranean region.

Figure 1: tourism ecostystem – target groups

Intergovernmental Bodies

- World Tourism Organization - UNWTO (https://www.unwto.org/).
- WTTC - World Travel and Tourism Council (https://www.wttc.org/).
- IOC-UNESCO (http://msp.ioc-unesco.org/).
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).

Sectoral Associations

- ETC - European Travel Commission (https://etc-corporate.org/).
- NECSTouR - Network of European Regions for a Sustainable and Competitive Tourism (https://necstour.eu/).
- European tourism association (https://www.etoa.org/).
- Virtual Tourism Observatory (https://ec.europa.eu/growth/tools-databases/vto/).
- Tourism Business Portal (https://ec.europa.eu/growth/sectors/tourism/business-portal_en).
- Enterprise Europe Network: tourism and cultural heritage (https://een.ec.europa.eu/).
- European Destinations of Excellence (EDEN) (https://ec.europa.eu/growth/sectors/tourism/eden/about_en).
- European Tourism Indicators System for sustainable destination management (https://ec.europa.eu/growth/sectors/tourism/offer/sustainable/indicators_en).
- Europark Federation (https://www.europarc.org/sustainable-tourism/).

Maritime Clusters

- European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).

Funding options and agencies
Funding options for tourism related research is largely based on national and European research projects. Possible European funding can be absorbed through: • LIFE. • COSME. • Creative Europe Programme.
• Employment and Social Innovation. • Intereg and MED programmes. • S4. • ESPON. • UNWTO. • National research agencies. • ERC funding schemes. • Tourism industry research funding.

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Sharing key information about the ongoing projects, knowledge, infrastructure and stakeholders involved with the blue growth. • UNWTO. • EU Sustainable Tourism Group. • Green destinations.	**How:**	Working groups meetings, conferences and online communication platform for sharing knowledge.
		When:	2020.
Funding	Support of strategic initiatives aimed at setting up the key enabling technology for monitoring and big-data based analytics.	**How:**	Regional SRIA implementation fund; either as a special Mediterranean development fund or as a share of the existing funding schemes.
		When:	2020 – 2023 (at least one per year).
Alignment and coordination	Synchronizing ideas and resources towards common goals of the SRIA and prevention of double funding misuse of knowledge, time and other resources. This will result in increasing the invested R&D euro.	**How:**	SRIA platform with detailed database about project ideas, ongoing projects, funding opportunities, key outcomes of completed projects.
		When:	2020.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• CSA. • Promotion of START UP's. • BlueBoats MED. • Share results, issues, gaps. • Interreg.	**How:**	E-newsletter, rapport.
		When:	
Start-Up actions	Testing innovative ideas at the TLR 1 – 6 levels and set them ready for market implementation.	**How:**	Special development fund supported by public sector and industry.
		When:	2021.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• Digital Ecosystems for Coastal tourism destinations – Mapping the opportunities. Methods to facilitate the capacity of the tourism ecosystem to direct and promote a sustainable and competitive coastal tourism. • The research and innovation program should develop digital ecosystems able to produce Intelligence for the design of policies capable of responding to the concrete needs of coastal destinations and businesses. In particular, the innovative research pathway should allow. • The realization of a map of opportunities able to analyse and interpret the interconnections between attractions, territory, production system and changing patterns in tourism demand behaviour. It will therefore have to support territorial systems and businesses with new perspectives of development of destinations and local tourism products as well as business management practices, providing at the same time operational tools to improve competitive and sustainable positioning. • Pilot projects have already been launched in Italy with the involvement of both private associations (e.g. Chambers of Commerce) and public stakeholders at regional level. The ongoing activity could serve as a base for the deployment and the sharing of the outcomes and the critical issues emerged.	**How:**	Mapping the opportunities.
		When:	2020.
Lobbying actions	Supporting systematic and institutional (regional, national, local) support for SRIA.	**How:**	Setting the implementation agenda and networking with existing groups.
		When:	2020-2023.
Training and capacity building initiatives		**How:**	
		When:	
SRIA Community and Implementation Working Groups (IWG) on specific sectors	• SRIA communities (platforms) should be supported after the BlueMed project is completed with enough funding to support development and implementation of at least one R&D project per Fishe.	**How:**	Founded as a special working group body within EU or other territorial authority, with enough impact to provide political and financial support.
		When:	
Communication and engagement		**How:**	
		When:	

FICHE 6

EFFECTIVE MARITIME SPATIAL PLANNING IN THE MEDITERRANEAN

CO-CHAMPION COUNTRIES: ITALY & TURKEY / SUPPORTING COUNTRIES: SPAIN, EGYPT

Background

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 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.

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 are already ongoing at national and sea basin scale (e.g. MSFD implementation, update of Barcelona Convention Regional Frameworks, 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.

The process that brought to the last update of the BLUEMED SRIA (http://www.bluemed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf), involving CSA partners and national pivots, through the BLUEMED Platforms, identified for Goal E-E2 the following nine Actions:

- 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).
- E2.2 Develop **coastal ecological engineering solutions and measures** taking into account also pressures derived from economical drivers on land.
- 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.
- E2.4 Use **integrated decision tools** to select appropriate sites for offshore installations, to ensure that they meet energy and environmental requirements.
- E2.5 Address **transboundary maritime spatial planning** issues to understand problems and opportunities (social, economic, environmental) and strengthen knowledge on environmental pressures across borders.
- 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 marine resources, considering social and economic aspects.
- E2.7 Promote innovative technologies and services for a sustainable management and resulting **protection of coastal areas from coastal erosion, flooding and pollution.**
- 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.
- E2.9 Develop **best practices for deep-sea adaptive management** based on open data from diverse stakeholders and a common/shared and long-term vision.

Text in blue identifies Actions selected by countries as the "Most relevant actions identified to reach the selected goal" during the SRIA prioritization process.

Mapping and discussing implementation options and potentials of this priority			
Recent and ongoing relevant projects			
PROJECT	**DESCRIPTION**		**OBJETIVES**
ADRIPLAN ADRiatic Ionian maritime spatial PLANning **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8	**Call:** MARE/2012/25 **Duration:** Dec 2013 – Aug 2015	**EU Contribution:** 1.250.000,00 € **Website:** http://adriplan.eu/	ADRIPLAN aims to deliver a commonly agreed approach to cross-border MSP in the Adriatic-Ionian region. The project developed proposals and recommendations for MSP on the Adriatic-Ionian Macroregion and on two Focus Areas represented by the Northern Adriatic Sea (Focus Area 1) and the Southern Adriatic – Northern Ionian Sea (Focus Area 2).
SUPREME SUpporting maritime spatial Planning in the Eastern Mediterranean **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8	**Call:** EASME/EMFF/2015/1.2.1.3 **Duration:** Jan 2017 – Dec 2018	**EU Contribution:** 2.000.000,00 € **Website:** http://www.msp-supreme.eu/	Support the implementation of Maritime Spatial Planning in EU Member States within their marine waters in the Eastern Mediterranean, including the Adriatic, Ionian, Aegean and Levantine Seas. Launch and carry out concrete and cross-border MSP initiative between Member States in the Eastern Mediterranean.
SIMWESTMED Supporting Implementation of Maritime Spatial Planning in the Western Mediterranean region **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8 / E2.9	**Call:** EASME/EMFF/2015/1.2.1.3 **Duration:** Jan 2017 – Dec 2018	**EU Contribution:** 2.258.343,00 € **Website:** https://www.msp-platform.eu/projects/supporting-maritime-spatial-planning-western-mediterranean-region	SIMWESTMED focused on two key objectives: Supporting the implementation of Maritime Spatial Planning in EU Member States; Launching and carry out concrete and cross-border MSP initiatives between Member States. To address these objectives the activities undertaken focused on the following issues: - Initial assessment - Cooperation on MSP in Western Mediterranean. - MSP process. - Methodology for a transboundary MSP. - Spatial demands and future trends. - Data and information's requirements for MSP. - Tools and methods supporting MSP. - Stakeholder's engagement.
MUSES Multi-use of European seas **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8	**Call:** H2020-SC2-BG03-2016 **Duration:** Nov 2016 – Oct 2018	**EU Contribution:** 1.982.104,00 € **Website:** https://muses-project.com/	The Multi-Use in European Seas (MUSES) project is a Horizon 2020 funded project that is exploring the opportunities for Multi-Use in European Seas across five EU sea basins (Baltic Sea, North Sea, Mediterranean Sea, Black Sea and Eastern Atlantic).
PORTODIMARE geoPortal of Tools & Data for sustainable Management of coAstal and maRine Environment **SRIA Action:** E2.9	**Call:** INTERREG ADRION **Duration:** Feb.2018 – Jul 2020	**EU Contribution:** 1.581.219,00 € **Website:** https://portodimare.adrioninterreg.eu/	PORTODIMARE project aims at creating a common platform (Geoportal) for data, information and decision support tools focused on coastal and marine areas of the Adriatic-Ionian Region. The Geoportal integrates and further develops existing databases, portals and tools developed within previous EU projects by local and national administrations and by other initiatives. Through this approach, most of the available knowledge and resources will be efficiently organized and made accessible through a single virtual space, thus supporting coordinated, regionally / transnationally coherent and transparent decision-making processes, with the perspective of remaining operative and being expanded well beyond the project conclusion.

GEF Adriatic Project Implementation of Ecosystem Approach in the Adriatic Sea through Marine Spatial Planning **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8	**Call:** GEF ID No. 9545 **Duration:** Oct 2017 – Sept 2019	**GEF Contribution:** 1.817.900,00 USD **Website:** http://addis.unep.org/projectdatabases/01423/project_general_info	The Project will, first, develop a methodological framework for a coastal and marine monitoring programme, and, second, utilize, through MSP, the results of the SAP-MED and SAP-BIO implementation achieved to date. While the Project will implement ecosystem-based management activities, including the MSP, in two GEF-eligible countries of the Adriatic sub-region (Montenegro and Albania), it will also provide information and support to include other countries of the region, in particular through dissemination of knowledge and experience in developing marine spatial plans.
MSP Med Paving the Road to MSP in the Mediterranean **SRIA Action:** E2.1 / E2.3 / E2.5 / E2.8	**Call:** UNEP **Duration:** Dec 2014 – Dec 2015	**EU Contribution:** n.a. **Website:** http://www.pap-thecoastcentre.org/about.php?blob_id=101&lang=en	The project, that was of a pilot nature, intended to facilitate the implementation of the ICZM Protocol, in particular with regards to its provisions related to the marine part of the coastal zone, by evaluating methodologies and existing tools, proposing possible cooperation/management schemes and identifying prerequisites and possible ways to deal with the challenges, in an effort to assist the CPs to meet the common objectives of integrated marine spatial planning and management.
PHAROS4MPAS Blue Economy and Marine Conservation: Safeguarding Mediterranean MPAs in order to achieve Good Environmental Status **SRIA Action:** E2.3 / E2.8	**Call:** Interreg MED Programme 2014-2020 **Duration:** December 2017 - May 2019	**EU Contribution:** 1.179.496,57 € **Website:** https://pharos4mpas.interreg-med.eu/	The general objective of the PHAROS4MPAs project is to enhance management effectiveness and networking for Mediterranean MPAs, in order to contribute to the conservation of marine biodiversity and natural ecosystems, taking into account the complex ensemble of human activities developed within the Blue Growth perspective and their interaction with protected areas and marine ecosystems. Project outputs include delivering common capitalization baselines, recommendations and policy tools adapted to appropriation by the MedPAN network, MSP authorities, the European Commission, the Barcelona Convention and the various maritime sectors.
AQUASPACE Ecosystem Approach to making Space for Aquaculture **SRIA Action:** E2.3 / E2.8	**Call:** H2020-EU.3.2. **Duration:** March 2015 - May 2019	**EU Contribution:** 1.179.496,57 € **Website:** https://pharos4mpas.interreg-med.eu/	The general objective of the PHAROS4MPAs project is to enhance management effectiveness and networking for Mediterranean MPAs, in order to contribute to the conservation of marine biodiversity and natural ecosystems, taking into account the complex ensemble of human activities developed within the Blue Growth perspective and their interaction with protected areas and marine ecosystems. Project outputs include delivering common capitalization baselines, recommendations and policy tools adapted to appropriation by the MedPAN network, MSP authorities, the European Commission, the Barcelona Convention and the various maritime sectors.

Coconet Towards COast to COast NETworks of marine protected areas (from the shore to the high and deep sea), coupled with sea-based wind energy potential **SRIA Action:** E2.4 / E2.6	**Call:** FP7-KBBE - Specific Programme "Cooperation": Food, Agriculture and Biotechnology **Duration:** February 2012 - January 2016	**EU Contribution:** 9.000.000,00 € **Website:** https://cordis.europa.eu/project/rcn/101654/factsheet/en	The project had two main themes: 1 - Identify prospective networks of existing or potential MPAs in the Mediterranean and the Black Seas, shifting from a local perspective (centred on single MPAs) to the regional level (network of MPAs) and finally the basin scale (network of networks). 2 - Explore where offshore wind farms (OWF) might be established, producing an enriched wind atlas both for the Mediterranean and the Black Seas.
MANTIS Marine protected Areas Network Towards Sustainable fisheries in the Central Mediterranean **SRIA Action:** E2.3 / E2.8	**Call:** EU DG MARE 2014/41 "Marine protected areas: network(s) for enhancement of sustainable fisheries in the EU Mediterranean waters **Duration:** December 2015 - April 2019	**EU Contribution:** 630.000,00 € **Website:** http://jadran.izor.hr/mantis/index.html	The main objectives of the project are to: 1. Review and integrate the knowledge produced in previous national and EU funded projects on the space-time dynamics of fisheries resources and on Ecosystem Approach to Fishery in the Central Mediterranean. 2. Investigate how a network of marine managed areas (MMAs) can contribute to improve sustainable fisheries in the Central Mediterranean focusing on two case studies, the Strait of Sicily and the Northern Adriatic.
ECOAST New methodologies for an ecosystem approach to spatial and temporal management of fisheries and aquaculture in coastal areas **SRIA Action:** E2.6	**Call:** ERA-net **Duration:** March 2016 - December 2018	**EU Contribution:** 2.273.800,00 € **Website:** http://www.e-coast.eu/wp/	ECOAST aimed to identify, develop and test new methodologies for spatial and temporal management of fisheries and aquaculture in coastal areas. The overall approach assessed the impact of fisheries and aquaculture on coastal ecosystems, as well as synergies and conflicts between human activities. Building on previous methodologies and experiences the project evaluated marine spatial planning in seven coastal case study areas with different ecological and socio-economic characteristics: Adriatic Sea, Ionian Sea, Black Sea, Tyrrhenian Sea, Baltic Sea, Norwegian fjords and North-East Atlantic coast.
IDEM Implementation of the MSFD to the DEep Mediterranean Sea **SRIA Action:** E2.9	**Call:** DG ENV **Duration:** April 2017 - March 2018	**EU Contribution:** 960.000,00 € **Website:** http://www.msfd-idem.eu/	The project IDEM (Implementation of the MSFD to the DEep Mediterranean Sea) aims to support the next phase of MSFD implementation, in particular to achieve, by the end of the project, a regionally coherent, coordinated and consistent initial environmental assessment and determination of GES, as well as the definition of sets of environmental targets for the Mediterranean deep Sea (below 200 m of depth). Beside this, IDEM aims at understanding, quantifying and mapping drivers, anthropogenic pressures and impacts, current knowledge and spatial coverage of data regarding the MSDF indicators in the Mediterranean deep sea. These represent crucial steps towards developing a comprehensive set of environmental targets and associated indicators/criteria that can be used to extend the concept of Good Environmental Status (GES) to the deep sea.

COASTAL **Co-creating evidence-based business roadmaps and policy solutions for enhancing coastal-rural collaboration and synergies** **SRIA Action:** E2.1, E2.6, E2.7	**Call:** H2020-SC2-RUR02-2017 **Duration:** May 2018 – April 2022	**EU Contribution: n.a.** **Website:** www.h2020-coastal.eu	The overarching objective of COASTAL is to improve the rural-coastal synergies in strategic business and policy decision making and collaboration between coastal and rural actors. This is achieved by developing, demonstrating and applying a generic toolset and performance indicators by combining a multi-actor approach with system dynamics modelling. This allows us to understand the interactions with market, demographic, environmental and climate forecasts, and quantify the positive and negative externalities. By combining local knowledge and scientific expertise in a co-creation process the COASTAL project engages actors and stakeholders at all levels to improve coastal-rural interdependence and collaboration by identifying problems and setting up evidence-based business roadmaps and policy solutions, focusing on economic growth, marine spatial planning, and environmental protection, including inland water quality.
DEKOSIM Center for Marine Ecosystem and Climate Research	**Call:** Ministry of Development, Turkey **Duration:** 2012-2022	**National Contribution :** 3 M€ **Website :** Dekosim.ims.metu.edu.tr	DEKOSIM is an interdisciplinary centre of excellence funded by the Turkish Ministry of Development, established at the Institute of Marine Sciences of the Middle East Technical University. The main objective is to create an infrastructure that focuses on interdisciplinary research linking physical, chemical, biological and geological marine research. DEKOSIM aims to reach scientific excellence in marine ecosystem and climate research and provide highest-quality services to Blue Growth Sectors
METU BLUE GROWTH CENTER	**Call: Middle East Technical University** **Duration: 2018-**	**Website :** ims.metu.edu.tr	The main aim of the METU Blue Growth Center is to develop and implement Blue Growth activities both at the local in Turkey but also at the wider regional level in Eastern Mediterranean and the Black Sea. The center focuses on converting knowledge base from monitoring and integrated modelling systems to services and products that can be exploited by public and industry sectors. A pilot MSP project proposal has been prepared together with governmental offices to develop a methodology for ecosystem based sea-use management to be used to develop national MSP regulations.

Other projects may be of interest, tackling specific sea uses (e.g. energy, fisheries, maritime transport, sustainable tourism), including conservation, with spatial and integrated planning and management consequences.

Taking into account results of the above projects, ongoing policy implementation processes, blue growth trends and MSP-related challenges in the Mediterranean, the list and specific content of priority actions will be revised and upgraded during the deployment of the Implementation Plan, to inform the Final Implementation Plan (September 2020). National MSP processes should be finished by March 2021, in this way, the BLUEMED implementation plan and national processes should be aligned in objectives and actions. However, MSP national processes are not in the same stage in each country, e.g. Spain is in early stage of MSP compared to France, for this reason it is important taking the experience of the recent and ongoing MSP European projects and the objectives of BLUEMED which require scientific and knowledge support, such as R&I, in terms of dedicated technologies to support the governance on the Mediterranean Sea.

Key issues identified are:

- **Coherence between terrestrial and maritime planning** is a key, improving the understanding at proper spatial scales of Land-Sea Interactions (LSI), integrated management of land and maritime activities and resources and reducing impacts to the marine environment (ref. to E2.1).

- Transboundary MSP / Cooperation (e.g. Awareness and better definition of maritime zones in the Mediterranean, E2.5 Address transboundary maritime spatial planning issues to understand problems and opportunities and strengthen knowledge on environmental pressures across borders; transboundary offshore protected areas).

- Better understanding and capability to quantify **cumulative effects/impacts of anthropogenic pressures** on environmental components and resources, to support MSP scenarios and decisions, in close connection with the MSFD process and Programme of Measures, and conservation measures (i.e. potential areas for new MPAs, improved connectivity of the MPA network, reduced impact on existing MPAs from other maritime uses) (ref. to E2.6, E2.8, E2.4).

- Awareness and better understanding of MSP needs, drivers and solutions for planning and management of **deep sea spaces and resources** (Mediterranean deep sea covers ca. 80% of the MED area, but most areas are still largely unexplored), in close connection with transboundary governance issues (ref. to E2.9, E2.5).

- Define and study approaches and tools to identify the **trade-offs between ecological dynamics and socio-economic needs** (e.g. environmental accounting) (ref. to E2.3).

- **Data for MSP** (connection of existing Geoportals (from national to EU to Intl.) on environment and human activities. Build a "Knowledge Catalogue" for MSP (ref. from E2.1, E2.9).

- **Stakeholder engagement** should be effective to ensure best practices in marine spatial planning of maritime sectors to contribute to the long-term sustainable use of the marine resources (ref. to E2.9).

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL STRATEGIES AND PROGRAMMES

- Barcelona Convention (in particular ICZM Protocol of the Barcelona Convention (UNEP, 2008) and Conceptual Framework for MSP in the Mediterranean) (http://wedocs.unep.org/bitstream/id/74412/17ig23_23_2307_eng.pdf).
- Sustainable Development Goals Agenda (UN, 2015), and in particular SDG14 ("Life below water") (https://sustainabledevelopment.un.org/sdg14).
- International Legally Binding Instrument under the UN Convention on the Law of the Sea (UNCLOS) on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (BBNJ) (https://enb.iisd.org/oceans/bbnj/igc3/).
- ACCOBAMS Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (http://www.accobams.org/).
- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021)
  https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
  UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020)
  https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf
- UfM Working Group on Blue Economy
  https://ufmsecretariat.org/ufm-working-group-blue-economy/
- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects
  https://ufmsecretariat.org/what-we-do/water-environment/

EUROPEAN STRATEGIES AND PROGRAMMES

- EU Maritime Spatial Directive (2014/89/EU).
- The goal E-E2 – EFFECTIVE MARITIME SPATIAL PLANNING IN THE MEDITERRANEAN is by definition cross-sectoral/cross-cutting, having the objective to promote the coexistence in space (terrestrial coastal area and marine waters) and the synergies among sea and coastal uses, not compromising ecosystems and the environmental objectives established by the International and EU policies. Therefore, harmonization with the implementation processes of several policies and directives is required (e.g. Marine Strategy Framework Dir (2008/56/EC), Water Framework Dir (2000/60/EC), EU Biodiversity Strategy 2020 (COM.(2011)244), Habitat & Birds Dir.(92/43/EEC; 2009/147/EC), Common Fisheries Policy (Reg.(EC)1967/2006; Reg.(EU)1380/2013; COM.(2011)804), Aquaculture (COM.(2013)229), Tourism (COM.(2010)352; COM.(2014)86), Energy (COM.(2008)768; COM.(2014)15); Reg.(EU)347/2013), Renewable Energy Dir.(2009/28/EC), Safety Oil & Gas Dir.(2013/30/EU), Transport (COM.(2009)10; COM.(2013)295; Reg.(EU)1315/2013), Bioeconomy (COM.(2012)60), EU Maritime Security Strategy (11205/14), Search & Rescue Dir (2013/32/EU)).

MACRO-REGIONAL STRATEGIES AND PROGRAMMES

- MSPglobal Initiative (UNESCO/IOC) (http://www.mspglobal2030.org/).
- EUSAIR (COM(2012)713; COM(2014)357), with regard in particular to Pillar 1 - Topic 3 (Maritime and marine governance and services) and Pillar 3 – Topic 1 (The marine environment) (https://www.adriatic-ionian.eu/).
- WESTMED (COM.(2017)183), with reference to Goal 3 — Better governance of the sea – and its priority "3.1 Spatial planning and coastal management" (https://www.westmed-initiative.eu/).

Target sectors and groups

Effective Maritime Spatial Planning is a key enabling factor for sustainable Blue Growth in the Mediterranean and elsewhere (COM(2012)494; COM(2014)254; SWD(2017) 128 final) and is also a key tool to promote the achievement of environmental objectives (e.g. MSFD, Barcelona Convention, SDG14), by reducing single and cumulative impacts from coastal and sea uses.

As such, all sectors of sea economy are potentially involved, together with public administrations, research, NGOs and the civil society.

Intergovernmental Bodies

- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en) and MSP Member States Expert Group (MSEG).
- UNEP/MAP (http://web.unep.org/unepmap/) and its Regional Centers (e.g. PAP-RAC, SPA-RAC, INFO-RAC, REMPEC).
- IOC-UNESCO (http://msp.ioc-unesco.org/).
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- GFCM (http://www.fao.org/gfcm/en/).
- ICCAT (International Commission for the Conservation of Atlantic Tunas (https://www.iccat.int/en/).
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).

Sectoral Associations and Technology Platforms

- European MSP Platform (https://www.msp-platform.eu/).
- European Aquaculture Technology and Innovation Platform (http://eatip.eu/).
- European Fisheries Technology Platform (http://eftp.eu/).
- Waterborne Technology Platform (https://www.waterborne.eu/).
- Observatoire Méditerranéen de l'Energie (OME) (http://www.ome.org/).

Maritime Clusters

- European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
- Pole Mer Mediterranee (https://www.polemermediterranee.com/).

NGOs

- WWF MED (http://mediterranean.panda.org/).
- MEDPAN (https://medpan.org/).
- IUCN Mediterranean (https://www.iucn.org/).

Funding options and agencies

International Programmes

- Horizon 2020 (in particular SC2-BG): https://ec.europa.eu/programmes/horizon2020/en
- European Maritime and Fisheries Fund (EMFF) (in particular the calls/tenders on Blue Economy and on MSP) (https://ec.europa.eu/fisheries/cfp/emff_en; https://ec.europa.eu/fisheries/sites/fisheries/files/docs/c-2018-8384-annex_en.pdf).
- Interreg MED – 2014-2020 (in particular Axes 3 "Natural and cultural resources" and Axes 4 "Governance) (https://interreg-med.eu/).
- Other cross-border and transboundary Interreg Programmes (e.g. ADRION (https://www.adrioninterreg.eu/), IT-HR (https://www.italy-croatia.eu/), IT-FR Marittimo (http://interreg-maritime.eu/).
- Interreg-IPA CBC IT-AL-MO (https://www.italy-albania-montenegro.eu/).
- ENI CBC MED (in particular Priority B.4.4. "Incorporate the Ecosystem-Based management approach to ICZM into local development planning, through the improvement of intra-territorial coordination among different stakeholders) (http://www.enpicbcmed.eu/enicbcmed-2014-2020).
- ESPON EGTC (https://www.espon.eu/programme/espon/espon-2020-cooperation-programme).
- GEF (https://www.thegef.org/).
- General Fisheries Commission for the Mediterranean (GFCM- FAO) (http://www.fao.org/gfcm/es/).
- Horizon Europe (in particular under Pillar 2 "Global Challenges and Industrial Competitiveness" – Cluster "Food and natural resources" and within the Mission "Healthy Oceans, Seas, Coastal and Inland Waters") (https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en).
- Marine Spatial Planning Programme at UNESCO-IOC: http://msp.ioc-unesco.org/about/msp-at-unesco/

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Participation in the National and Regional Trainings on MSP organised in the framework of the Western Mediterranean Pilot Project under MSPglobal Initiative (UNESCO/IOC). • National Workshop (Italy) on Blue Growth and Maritime Zones (TBC).	**How:**	Workshops for national authorities and stakeholders.
		When:	• Autumn 2019; Summer 2020. • Early 2020.
Alignment and coordination	• GSO BLUEMED Working Group. • Alignment and coordination with Westmed on initiatives and projects on MSP. To be discussed with Westmed Presidency / vice-Presidency and the Steering Committee. • Alignment and coordination with EUSAIR on initiatives and projects on MSP. To be discussed with Pillar 1 and Pillar 3 coordinators and with the EUSAIR Facility Point. • Alignment and coordination with UNESCO/IOC on the MSPglobal Initiative, and in particular with the Western Mediterranean Pilot Project. • Alignment and coordination with UNEP/MAP on the process to adopt and implement the "Conceptual Framework for MSP in the Mediterranean". • Alignment and coordination with Dg Mare MSEG and MSP Platform Technical Assistance.	**How:**	Meetings and activities for the identification of priority topics / actions and of options for joint implementation. Research to strengthen dialogue and institutional capacities.
		When:	2019 – 2023.

Activities to promote the SRIA Implementation			
Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach		**How:**	
		When:	
Start-Up actions		**How:**	
		When:	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• Participation of BLUEMED as Observer in the new project/s (call EMFF-2019-1.2.1.8) on MSP implementation in the Mediterranean. • Participation of BLUEMED at the Final Conference of the project ADRION-PORTODIMARE (geoPortal of Tools & Data for sustainable Management of coAstal and maRine Environment). • Participation of BLUEMED at the Capitalization Phase of the project MED-PHAROS4MPAS (Blue Economy and Marine Conservation: Safeguarding Mediterranean MPAs in order to achieve Good Environmental Status). • Capitalization within BLUEMED of the results of ongoing activities on MSP of the Italian Cluster on Blue Growth "BIG": Trajectory "Sustainability and economic uses of the sea" and ITEM Project.	**How:**	Bidirectional exchange of results and experiences, through dedicated workshops and meetings.
		When:	October 2019 – September 2020.
Lobbying actions	• Actions to highlight the role of Effective Maritime Spatial Planning within the Horizon Europe Mission on Healthy Oceans, Seas, Coastal and Inland Waters, and to promote dedicated calls. • Actions to highlight the role of Effective Maritime Spatial Planning to Interreg and ENI CBC Managing Authorities, also via the Regional Strategies and Initiatives cited above, and to promote dedicated calls.	**How:**	Dedicated meetings.
		When:	2020 – 2023.
Training and capacity building initiatives	• Training on "Ecosystem-Based Management in/for MSP", jointly organised with MED-PANACEA 2 project (TBC). • Training course on "Science-Policy-Society interactions in marine resource management", jointly organised with COST (European Cooperation in Science and Technology). • Training course about MSP for non-EU countries, also exploring potentials from the new EMFF Blue Skills calls.	**How:**	Co-organisation and participation in training courses and capacity building events.
		When:	• Summer 2020. • March 2020. • TBD.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Implementation Working Groups (IWG) on specific sectors		**How:**	
		When:	
Communication and engagement	• Thematic Event on MSP on R&I needs for Effective MSP in the Mediterranean, at the BLUEMED Final Conference. • News, announcements, new materials, etc.	**How:**	Dedicated Session at Bluemed Final Conference / Website, social networks (twitter, facebook, instagram...).
		When:	September 2020 / Social media during the whole process.

FICHE 7
GREENING VESSELS, FACILITIES AND SERVICES
CO-CHAMPION COUNTRIES: ITALY & TURKEY

Background

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 as well as tourism-oriented 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 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.

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, NOx, SOx, 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 IMO. The implementation of such an area would address both sulfide and nitrogen oxides, and would have the greatest positive effect in reducing air pollution and bringing socioeconomic 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.

With reference to the Bluemed SRIA the following actions, relevant for the priority "Greening vessels, facilities and services", have been selected:

- 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, dismantling and recycling costs from the perspective of the circular economy.
- 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.
- T-A1.4 Exploit new technologies and tools to monitor pollution from ships on route coast and in harbours.
- 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.
- 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.
- 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.
- 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 from wind renewable energy doing a paradigm shift towards entirely emissions-free maritime transport.
- 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.
- 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.

Proposals for new actions

- Short term R & I actions to support the **'zero emissions'** targets in vessels/facilities are needed. For example, the demonstration of utilization of solar energy/new photovoltaics (in vessels/ports) can be a **short-term** action.
- Address the problem of biofuling.
- Improve traffic monitoring system and share information to increase the overall efficiency of the transport system.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

Focus is on the international level, which means including mostly information of European/international projects that are relevant to the priority and to the MED area.

For the topic "Greening vessels, facilities and services" there are not specific calls under SC2 "Blue Growth". Calls labelled BG have been issued under "Smart, green and integrated transport" (SC4) but so far have been focused mainly on underwater vehicles and technologies. Only the latest BG calls will include topics related to "Low carbon technology" and "Underwater noise". A list of projects related to the specific actions selected from the Bluemed SRIA is reported below.

PROJECT	DESCRIPTION		OBJETIVES
HOLISHIP HOLIstic optimisation of SHIP design and operation for life cycle	**Call:** H2020-MG-2015 **Duration:** Sept. 2016 – Aug. 2020	**EU Contribution:** 11.431.746€ **Website:** http://www.holiship.eu	Maritime products are designed based on customer requirements and have to show high efficiency, flexibility and low environmental impact at a competitive price. Product design is thus subject to global trade-offs among traditional constraints (customer needs, technical requirements, cost) and new requirements (life-cycle, environmental impact, rules). The HOLISHIP project addresses these industry needs by developing innovative design methodologies and integrating diverse requirements at an early design stage. The project will develop integrated design platforms and demonstrate the concepts in digital mock-ups.
LEANSHIPS Low Energy And Near to zero emissions Ships	**Call:** H2020-MG-2014 **Duration:** May 2015 – April 2019	**EU Contribution:** 21.550.241€ **Website:** http://www.leanships-project.eu	LeanShips is combining technologies for efficient and less polluting vessels with end-user requirements to demonstrate the effectiveness and reliability of energy saving and emission reduction technologies at full scale. The project targets CO_2 reduction of at least 25%, estimated fuel saving of up to 25% and expected decrease of Sulphur Oxides (SO_x), Nitrogen Oxides (NO_x) and particle matter air pollutants by up to 100%.
AIRCOAT Air Induced friction Reducing ship COATing	**Call:** H2020-MG-2017 **Duration:** May 2018 – April 2021	**EU Contribution:** 5.299.097€ **Website:** https://aircoat.eu/	AIRCOAT promotes a ground-breaking passive air lubrication technology with a high potential to revolutionise the ship-coating sector by reducing energy consumption and ship emissions.

QUIETMED2 Joint programme for GES assessment on D11- noise in the Mediterranean Marine Region	**Call:**DG ENV/MSFD 2018 **Duration:2018-**	**Website:** https://quietmed2.eu/	quietMED Project aims to get better coordination among member states that share marine regions and sub-regions to increase the protection level and the conservation status of the marine spaces of the Mediterranean Sea against the damages caused by underwater noise resulted from anthropogenic activities. quietMED project aims to improve the level of coherence and the comparability as regards Descriptor 11 (underwater noise) by enhancing cooperation among Mediterranean Sea Basin countries within the implementation of the second cycle of the Marine Strategy Framework Directive.
ProNoVi Analysis Methods and Design Measures for the Reduction of Noise and Vibration Induced by Marine Propellers	**Call**: MarTERA Cofund **Duration:** June 2018 – May 2021	**EU Contribution:** 1.900.000 € **Website:** http://www.pronovi.eu	The objective of the ProNoVi project is to improve the numerical and experimental methods for the prediction of noise and vibrations induced by a propeller operating behind ship hull in full scale conditions, and to elaborate practical recommendations for the reduction of noise and vibration levels for single and twin-screw vessels of different size and speed range.
HERCULES-2 Fuel Flexible, Near-Zero Emissions, Adaptive Performance Marine Engine	**Call:** H2020 **Duration:** 2016-2018	**EU Contribution :** 25.000.000 € **Website :** http://www.hercules-2.com/	The HERCULES-2 project takes into account: a) the increasing availability of alternative fuels and their potential contribution to the environmental and economic performance of vessels through their use in fuel flexible engines, b) the societal target of economic production of ship propulsion power with near zero emission s, c) the importance of lifetime performance optimization for new and existing ships, in the changing operational environment of global waterborne transport.
H2MOVE Hydrogen generator for higher fuel efficiency and lower carbon emissions in maritime transport	**Call:** H2020, SMEInst (small business innovation research for transport and smart cities mobility) **Duration:** 02/17 - 05/17	**EU Contribution:** 50.000€ **Website:** https://trimis.ec.europa.eu/project/hydrogen-generator-higher-fuel-efficiency-and-lower-carbon-emissions-maritime-transport	Aris Pump Ltd. developed H2MOVE, safe small foot-print hydrogen generator to be installed into engines of marine vessels to significantly improve performances, delivering 35% less air pollution, 30% better fuel efficiency and consequently 30% fuel cost saving with a safe hydrogen technology.
H2Ports Implementing Fuel Cells and Hydrogen Technologies in Ports	**Call:** H2020-JTI-FCH-2018-1 **Duration:** Jan. 2019 – Dec. 2022	**EU Contribution:** 3.999.948€ **Website:** https://h2ports.eu/	H2Ports aims to boost the transition of the European port industry towards an effective low-carbon/zero-emission and safe operative model, piloting, evaluating and demonstrating new Fuel Cell technologies oriented to increase energy efficiency, decarbonisation and safety of port terminals. The pilots to be tested in the project will be the first experiences of the use of hydrogen technologies in port handling equipment in Europe.

Poseidon Med II LNG Bunkering Project	**Call**: CEF **Duration:** 2016 – 2020	**CEF Contribution:** n.a. **Website:** https://www.poseidonmedii.eu/	Poseidon Med II is an EU co financed program that aims at promoting the adoption of LNG (Liquefied Natural Gas) as marine fuel in the Easter Mediterranean Sea, while making Greece an international marine bunkering and distribution hub for LNG in South Eastern Europe. Poseidon Med II is a partnership between 3 Mediterranean countries (Cyprus, Greece and Italy), which involves 6 European ports (Piraeus, Patras, Igoumenitsa, Heraklion, Limassol, Venice) and 1 LNG Terminal (Revithoussa LNG terminal). In order to promote small scale LNG services, 26 top business partners have joined forces, knowledge and experience.
SUPAIR Sustainable ports in the Adriatic-Ionian region	**Call:** ADRION-1st call **Duration:** Jan. 2018 –Dec. 2019	**EU Contribution:** 1.052.948€ **Website:** https://supair.adrioninterreg.eu/	SUPAIR will establish a network of ADRION low-carbon ports committed to exchange on good practices regarding soft and hard environment-friendly solutions for a greener, safer and more efficient transport system.
PortForward Towards a green and sustainable ecosystem for the EU Port of the Future	**Call:** H2020-MG-2017-Two-Stages **Duration:** 07/18 - 12/21	**EU Contribution:** €4.994.311 **Website**: http://www.portforward-project.eu/	PortForward proposes a holistic approach that will lead to a smarter, greener and more sustainable port ecosystem and which will include the following features: • The introduction of an Internet of Things (IoT) concept for port assets (infrastructure, vehicles, cargo, people). • The socio-economic analysis of the port interface with its surrounding area and the port-city, as well as the rest of the logistics value chain.
GAINN4MOS Sustainable LNG Operations for Ports and Shipping - Innovative Pilot Actions	**Call:** H2020 **Duration:** 01/15 - 09/19	**Website**: http://www.gainnprojects.eu/gainn4mos/	GAINN4MOS Action aims to improve the Motorways of the Sea network in 6 Member States by carrying out engineering studies of ships retrofitting and/or new buildings and port LNG infrastructures and bunkering stations and a large set of pilot projects.
LNGHIVE2 Infrastructure and Logistics Solutions	**Funding**: European co-funding CEF Transport **Duration:** 09/18 - 02/22	**EU contribution**: 3Million € **Website**: https://trimis.ec.europa.eu/project/lnghive2-infrastructure-and-logistics-solutions	LNGHIVE2 aims at offering holistic solutions to the new requirements of the shipping and the rail sectors. The main benefit will be in terms of completion of the adaptation of all LNG regasification plants in Spain and ensuring that all sizes of bunkering barges and ships can load LNG at Spanish plants.
CORE LNGas hive Core Network Corridors and Liquefied Natural Gas	**Funding**: European co-funding **Duration**: 01/14 - 12/20	**Website**: http://corelngashive.eu/en/	The Action, CORE LNGGas hive, aims at supporting the deployment of LNG infrastructure for maritime transport and ports operations along the Spanish and Portuguese sections of the Atlantic and Mediterranean Core Network Corridors in line with the corresponding Corridor Work Plans. It includes a group of studies and real-life pilot deployments.

Nearly all EU projects on ship electrification and fuel cells have specific application to the Northern basins, mainly Baltic sea, and do not include Mediterranean partner. Some examples are reported below.

PROJECT	DESCRIPTION		OBJETIVES
HySeas III Realising the world's first sea-going hydrogen-powered RoPax ferry and a business model for European islands	**Call**: H2020-MG-2017-Two-Stages **Duration:** 07/18 - 12/21	**EU Contribution:** €9.276.373 **Website**: https://www.hyseas3.eu/	The HySeas III project will bring to market the world's first zero emission, sea-going ferry that will be powered by hydrogen from renewable sources. It builds on the pioneering experience of the coordinator (Ferguson Marine), which previously developed the first diesel/electric hybrid ferry in 2013 and involves the leading European supplier of hydrogen fuel cell modules (Ballard Power Systems).
MARANDA Marine application of a new fuel cell powertrain validated in demanding arctic conditions	**Call**: H2020-JTI-FCH-2016-1 **Duration:** 03/17 - 02/21	**EU Contribution:** €2.939.458 **Website**: https://trimis.ec.europa.eu/project/marine-application-new-fuel-cell-powertrain-validated-demanding-arctic-conditions	In MARANDA project an emission-free hydrogen fueled PEMFC based hybrid powertrain system is developed for marine applications and validated both in test benches and on board the research vessel Aranda, which is one of about 300 research vessels in Europe. Special emphasis is placed on air filtration and development of hydrogen ejector solutions, for both efficiency and durability reasons. In addition, full scale freeze start testing of the system will be conducted.
Port-Liner Zero emission" ships for inland waterways	**Funding:** European **Duration:** 07/17 - 12/19	**Website:** https://www.portliner.nl/	The Action is part of a Global Project aiming to promote the uptake of zero emission shipping based on electric propulsion, targeting inland waterway vessels. As first step, six inland waterway vessels for container transport, with full electrical propulsion, fed by batteries (1.6 MW) containerized in E-Power boxes will be built and put into operation.
FLAGSHIPS Clean waterborne transport in Europe	**Call:** H2020-JTI-FCH-2018-1 **Duration:** 01/19 - 12/22	**EU Contribution:** €4.999.979 **Website:** https://flagships.eu/	The FLAGSHIPS project raises the readiness of zero-emission waterborne transport to an entirely new level by demonstrating two commercially operated hydrogen fuel cell vessels.
Other relevant recent projects are SONIC and AQUO (FP7) for the topic "*underwater radiated noise*", Tram (H2020) for the topic "modular ships".			

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL STRATEGIES AND PROGRAMMES

- Barcelona Convention (in particular *Dumping Protocol* of the Barcelona Convention (UNEP, 1976/1992) and *Prevention and Emergency protocol* (UNEP, 2002): http://wedocs.unep.org/bitstream/id/74412/17ig23_23_2307_eng.pdf
- The United Nations Convention on the Law of the Sea (UNCLOS).
- International Convention for the Prevention of Pollution from Ships (MARPOL Convention):
  - MARPOL Annex I – Prevention of Pollution by Oil.
  - MARPOL Annex IV - Prevention of Pollution by Sewage from Ships.
  - MARPOL Annex V - Prevention of Pollution by Garbage from Ships.
  - MARPOL Annex VI - Air Pollution, Energy Efficiency and Greenhouse Gas Emissions.
- International Convention for the Safety of Life at Sea (SOLAS).
- International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM): http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx
- Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species - Biofouling Guidelines (resolution MEPC.207 (62)).
- Ports:
  - Port Services Regulation (2017).
  - Review General Block Exemption Regulation (2017).
- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021) https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
  UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020) https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf
- UfM Working Group on Blue Economy https://ufmsecretariat.org/ufm-working-group-blue-economy/
- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects https://ufmsecretariat.org/what-we-do/water-environment/

EUROPEAN POLICIES

- EU Commission: Towards clean, competitive and connected mobility: the contribution of Transport Research and Innovation to the Mobility package, SWD (2017) 223.
- Strategic Transport Research and Innovation Agenda roadmap:
  - Cooperative, connected and automated transport (2019).
  - Transport electrification (2016).
  - Vehicle design and manufacturing (2016).
  - Low-emission alternative energy for transport (2016).
  - Network and traffic management systems (2016).
  - Smart mobility and services (2016).
  - Infrastructure (2016).

MACRO-REGIONAL STRATEGIES AND PROGRAMMES

- EUSAIR (COM(2012)713; COM(2014)357), with regard in particular to Pillar 2, https://www.adriatic-ionian.eu/
- WESTMED (COM(2017)183), https://www.westmed-initiative.eu/

EUROPEAN INITIATIVES AND AGENDAS

- Waterborne Technology Platform (Waterborne TP, http://www.waterborne.eu/) - Strategic Research Agenda for the European Waterborne Sector.
- European Council for Maritime Applied R&D (ECMAR, https://www.ecmar.eu) – ECMAR position paper (2017).
- Joint Programming Initiative for Healthy and Productive Seas and Oceans (JPI Oceans, http://www.jpi-oceans.eu/) – Strategic Research and Innovation Agenda.

Target sectors and groups

- International Maritime Organization (IMO, http://www.imo.org/).
- Union for the Mediterranean (UfM, https://ufmsecretariat.org/).
- Waterborne Technology Platform (Waterborne TP, http://www.waterborne.eu/).
- European Council for Maritime Applied R&D (ECMAR, https://www.ecmar.eu).
- Sea Europe (http://www.seaeurope.eu).
- Joint Programming Initiative for Healthy and Productive Seas and Oceans (JPI Oceans, http://www.jpi-oceans.eu/).
- International Towing Tank Conference (ITTC, https://ittc.info/).
- International Ship and Offshore Structures Congress (ISSC, http://www.issc2018.org/content/overview).
- Marine and shipping registers (certification).
  - RINA, https://www.rina.org/it
  - Lloyds, https://www.lr.org/
  - Bureau Veritas, https://www.bureauveritas.fr/
  - Det Norske Veritas, DNV, https://www.dnvgl.com/
- Port Authorities.
- Coastal Guards.

Clusters

- Pole Mer Mediterranee, https://www.polemermediterranee.com/

Funding options and agencies

- Horizon 2020:
  - Smart, green and integrated transport (SC4).
  - ERANET- Cofound: MARTERA.
- European Maritime and Fisheries Fund (EMFF).
- Interreg Programmes:
  - ADRION (https://www.adrioninterreg.eu/).
  - IT-FR Marittimo (http://interreg-maritime.eu/).
  - IT-HR (https://www.italy-croatia.eu/).
  - IPA CBC IT-AL-MO (https://www.italy-albania-montenegro.eu/).
  - Grece-Italy (https://greece-italy.eu/what-is-interreg-v-a-greece-italy-programme/).
- Horizon Europe (in particular under Pillar 2 "Global Challenges and Industrial Competitiveness" – Cluster "Climate, Energy and mobility") (https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en).
- CEF Transport- Connecting Europe Facility (CEF) for transport.
- World Bank - blue economy programmes.

Activities to promote the SRIA Implementation			
Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	Strengthening the cooperation with national and regional clusters.	**How:**	Organization of workshops on specific topics.
		When:	At least one per year.
Alignment and coordination	• Coordination with Waterborne to align the agendas. • Coordination with Eusair activities related to Pillar 2 *Connecting the Region*. • Coordination with the JPI-OCEANS to foster the inclusion of technological topics related to waterborne transport in the JPI agenda, aligned with the actions of the Bluemed SRIA and/or for the creation of a specific JPI action. • Coordination with Westmed. • Contribute to the ECA (emission control area) implementation.	**How:**	• Joint meetings specifically organized/invitation to participate to the next Bluemed. • Meetings/participation to the meetings of the other initiatives, TP, etc.
		When:	Sept. 2019-Sept. 2020.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	Noise from maritime transport: a cross cutting issue also related to observing systems, marine spatial planning and maritime sector. Build on existing initiatives such as MSFD reports and DG-ENV funded QUIETMED to develop a cross—cutting Bluemed-labelled best practice, integrating observing, planning and sectoral approaches/ representatives in a few selected pilot areas (short term).	**How:**	
		When:	
Start-Up actions	Monitor the creation and the activities of new start -up actions.	**How:**	Bluemed "Expo", Other "Expo".
		When:	Each year.
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• Monitor the results of the listed projects. • Monitor the activities of future projects that will be funded in the next BG calls. • Promote the submission of projects for new BG calls by consortia within the Bluemed community.	**How:**	• Annual report. • Bidirectional exchange of results and experiences, through dedicated workshops and meetings. • Networking activities (brokerage events, B2B, etc.).
		When:	2020-2023.
Lobbying actions	• Maintain the link with the national delegates/At Ministerial level, implementing effective and targeted communication strategies. • Consider the impact of military vessels and activities on the environment. Correlation with EDA -SRIA and promote dual use activities (greener vessels and operations but also monitoring activities carried out by military vessels).	**How:**	Meetings at National level.
		When:	As soon as possible, regularly.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Training and capacity building initiatives	• Support the creation of high level trans-Mediterranean training courses. • Promote the courses that already exist.	**How:**	Partnerships with Universities.
		When:	From Summer 2020 – Academic Year 2020/21.
Implementation Working Groups (IWG) on specific sectors	Regulation of ballast water, and other shipping-based inputs are regulated at IMO level but Bluemed can contribute towards monitoring the implementation of new regulation.	**How:**	Participation to IWG
		When:	
Communication and engagement	Disseminate the results of ongoing projects and discuss publicly the priorities and impacts of Bluemed initiative.	**How:**	• Participation of Bluemed to the future Transport Research Arena (TRA) Conference. • Organization of the "Bluemed annual conference" to monitor the results of ongoing projects and evaluate over time the impact of Bluemed.
		When:	• Starting from April 2020 and then each year. • Starting from July 2020 and then each year.

FICHE 8

EXPLORING THE POTENTIAL OF BLUE-BIOTECH

RELATED GOALS: E-A2. GENERATING NEW PRODUCTS AND SERVICES

CO-CHAMPION COUNTRIES: ITALY & TUNISIA

Background

The marine environment is the largest ecosystem of our planet and it is a key provider of goods and services to the human society. Beyond the food resources currently exploited on a daily basis, the marine environment has also been identified as a potential key provider of biotechnological novelty, both under the form of bioactive compounds and potentials for bio-mimicry. There is a general consensus that marine organisms might host metabolites and bio-solutions very different from those of terrestrial organisms, which might have a high potential for applications in biotechnology, materials and even engineering.

The Mediterranean Sea is unique in its physical, chemical and biological characteristics. Additionally, it is considered one of the marine environments exposed to the highest anthropogenic pressure due to the large populations present along its coasts and the heavy maritime traffic while being at the same time a hot-spot for unique biological diversity.

Despite this, a large gap remains between the biotechnological potential of the resources present in the marine environment, and especially in the Mediterranean Sea, and their exploration and exploitation. While direct economical 'weight' of blue biotech is proportionally small today (with a high number of emerging topics with low TRL), it may have a great potential on the long term. Recent advances in genomics and other (bio)molecular techniques are providing all necessary tools to access the still-untapped marine biotechnological resources on a larger scale and, consequently, enabling exploitation of the true promise of the blue biotechnology.

Fiche 8 aims at supporting initiatives filling the "Blue Biotech" knowledge gap. This goal is at the crossroads of biotechnology, food production, and sustainable use of bio-resources with socioeconomic impacts in several fields. Convergences are clear with European biotech infrastructures and a number of other initiatives.

Goals

EA2.1 Improve the knowledge of the Blue-Biotech

Increase and improve the knowledge on the Mediterranean Sea as a source of new molecules and compounds deriving from marine microbes, algae, seaweeds and invertebrates to be used for new drugs (e.g., antibiotics, antioxidants, immunomodulators, antivirals, antidiabetics anticancer compounds), functional ingredients for human health (e.g., polysaccharides, mineral, vitamins, proteins) and industry (e.g., pigments) and environmentally-applicable molecules or organisms (e.g., bioremediating microbes or agents).

EA2.2 Study and define the economic potential of Marine Biotechnology

Evaluate Blue Biotechnologies for their economical impact as a growing field, and promote the concept of industry-academia partnerships as a win-win collaboration system.

EA2.3 Support the development of Marine Biotech

Foster collaborative research through transdisciplinary fields of expertise (e.g. genomics, data bases, outreach) and promote education through training the next generation of marine biotechnologists.

EA2.4 Implementing or create shared policies within the Mediterranean basin for a sustainable exploitation of marine bio-resources and/or biomasses

Create, improve or implement dedicated policies on the use and exploitation of Mediterranean Sea environment and life for biotechnological purposes, and to share such common policies and practices among all the actors of blue-biotech in the Mediterranean area.

Mapping and discussing implementation options and potentials of this priority			
Recent and ongoing relevant projects			
PROJECT	**DESCRIPTION**		**OBJETIVES**
ASSEMBLE Association of European Marine Biological Research Laboratories Expanded	**Call**: H2020-INFRAIA-1-2016-2017 **Duration:** October 2017-September 2020	**EU Contribution**: € 9.999.911,47 **Website:** http://www.assembleplus.eu/	ASSEMBLE Plus integrates over 30 marine biological stations and installations from various regions of the world's oceans and seas; providing scientists from academia, industry and policy with the services of these marine stations.
BAMMBO Biologically Active Molecules of Marine Based Origin	**Call:** FP7-KBBE-2010-4 **Duration:** March 2011-March 2014	**EU Contribution**: € 2.992.421 **Website:** http://www.bammbo.eu	BAMMBO will provide innovative solutions to overcome existing bottle-necks associated with culturing marine organisms in order to sustainably produce high yields of value-added products for the pharmaceutical, cosmetic and industrial sectors.
BlueGenics From gene to bioactive product: Exploiting marine genomics for an innovative and sustainable European blue biotechnology industry	**Call:** FP7-KBBE **Duration:** August 2012-July 2016	**EU Contribution**: € 5.999.869 **Website:** http://bluegenics.eu	BlueGenics is an EU-FP7 project with the aim to combine the knowledge in marinegenomics, chemogenetics and advanced chemistry to produce recombinantly prepared novel secondarymetabolite (lead) compounds and analogous from them, as well as pharmacologically active peptides, and to bring them up to the pre-clinical, and hopefully also to the clinical studies.
CIRCLES Controlling mIcRobiomes CircuLations for bEtter food Systems	**Call** H2020-SFS-2018-1 **Duration**: November 2018-October 2023	**EU Contribution**: € 9. 999.964,88 **Website:** https://circlesproject.eu/	CIRCLES will provide the scientific knowledge to exploit natural microbiomes for the sustainable production of high-quality food, with the ultimate objective to deliver new and healthier food applications. CIRCLES will explore microbiome interactions and circulations across **7 food chains**: spinach, tomatoes, poultry, swine, farmed and wild salmon, and farmed and wild seabream.
EMBRIC European Marine Biological Research Infrastructure Cluster to promote the Blue Bioeconomy	**Call** H2020-EU.1.4.1.1. **Duration:** June 2015-May 2019	**EU Contribution**: € 9 041 611 **Website:** www.embric.eu	The objectives of EMBRIC are to: develop integrated workflows of high quality services for access to biological, analytical and data resources, and deploy common underpinning technologies and practices; strengthen the connection of science with industry by engaging companies and by federating technology transfer services; defragment RDI policies and involve maritime regions with the construction of EMBRIC.
ERA-NET MarineBiotech	**Call** FP7-KBBE **Duration:** December 2013-November 2017	**EU Contribution**: € 1.999.838 **Website:** www.marinebiotech.eu	ERA-NET MarineBiotech recognises that Europe's marine ecosystems and organisms are largely unexplored, understudied and underutilized, in spite of Europe's access to an extensive and diverse set of marine ecosystems, supporting an enormous marine biodiversity.

EUROFLEETS+ An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities	**Call** H2020 **Duration:** 01 February 2019 – 31 January 2023	**EU Contribution**: € 9.999. 360,.58 **Website:** https://www.eurofleets.eu	Integrating and opening existing national and regional research infrastructures of European interest. EUROFLEETS+ prioritises support for research on sustainable, clean and healthy oceans, linking with existing ocean observation infrastructures, and supports innovation through working closely with industry. The project will enable access to a unique fleet of 27 state-of-the-art research vessels from European and international partners.
GIAVAP Genetic Improvement of Algae for Value Added Products	**Call** FP7-KBBE-2010-4 **Duration**: January 2011-December 2013	**EU Contribution**: € 5.596.607 **Website:** https://cordis.europa.eu/project/rcn/97420_en	GIAVAP adapts genetic engineering techniques to various algal strains of economic interest focusing on carotenoid and PUFA production and the overexpression of peptides of commercial value. In parallel it will develop cultivation technologies, harvesting and extraction methods for lipids, carotenoids and proteins using existing model algae strains that will then be adapted to suitable improved strains. Furthermore products will be tested for energy, pharmaceutical, nutritional or medical applications for economic evaluation of the production processes and their economic exploitation.
INMARE Industrial Applications of Marine Enzymes: Innovative screening and expression platforms to discover and use the functional protein diversity from the sea	**Call:** H2020-EU.3.5. **Duration:** April 2015-March 2019	**EU Contribution**: € 5.999.557,13 **Website:** http://www.inmare-h2020.eu/ Contract Nr 634486	INMARE unifies multidisciplinary expertise and facilities, including advanced technologies to access and sample unique marine biodiversity hot-spots; state-of-the art technologies for construction of metagenomic libraries; innovative enzyme screening assays and platforms; cutting-edge sequence annotation pipelines and bioinformatics resources; high-end activity screening technology; bioanalytical and bioprocess engineering facilities and expertise, nanoparticle-biocatalysts; high-quality protein crystallization and structural analysis facilities and experts in IP management for biotechnology.
LYPOYEASTS Mobilising the enzymatic potential of hydrocarbonoclastic bacteria and the oleaginous yeast Yarrowia lipolytica to create a powerful cellular production platform for lipid-derived industrial	**Call** FP7-KBBE-2007-1 **Duration:** August 2008-July 2011	**EU Contribution**: € 911,111 **Website:** http://www.lipoyeasts.ugent.be	This project develops a versatile fermentation platform for the conversion of lipid feed stocks into diverse added-value products. It will develop the oleaginous yeast Yarrowia lipolytica into a microbial factory by directing its versatile lipid metabolism towards the production of different industrially valuable compounds.
MaCuMBA Marine Microorganisms: Cultivation Methods for Improving their Biotechnological Applications	**Call** FP7 Cooperation, KBBE **Duration:** August 2012 – July 2016	**EU Contribution**: € 8.999.948,00 **Website:** www.macumbaproject.eu	The objective of the MaCuMBA project is to uncover the untold diversity of marine microbes using cultivation-dependent strategies. Furthermore, MaCuMBA aims to improve the isolation rate and growth efficiency of marine microorganisms from conventional and extreme habitats by applying innovative methods and using automated high-throughput procedures

MAMBA Marine metagenomics for new biotechnological applications	**Call** FP7-KBBE-2008-2B **Duration:** July 2009-June 2013	**EU Contribution**: € 2.875.245 **Website:** http://mamba.habgor.ac.uk/media.php	The Project aims at the mining of individual enzymes and metabolic pathways from extremophilic marine organisms and the metagenomes from microbial communities from peculiar marine environments and consequent funnelling the new enzymatic reactions and processes towards the new biotechnological applications.
MAREX Exploring marine resources for bioactive compounds: from discovery to sustainable production and industrial applications	**Call** FP7-KBBE-2009-3 **Duration:** August 2010-July 2014	**EU Contribution**: € 5.999.984 **Website:** http://www.marex.fi	MAREX project will collect, isolate and classify marine organisms, such as micro- and macroalgae, cyanobacteria, sea anemones, tunicates and fish from the Atlantic, Pacific and Indian Oceans as well as from the Mediterranean, Baltic and Arabian Seas. Extracts and purified compounds of these organisms will be studied for several therapeutically and industrially significant biological activities, including anticancer, anti-inflammatory, antiviral and anticoagulant activities by applying a wide variety of screening tools, as well as for ion channel/receptor modulation and plant growth regulation.
MarPipe Improving the flow in the pipeline of the next generation of marine biodiscovery scientists	**Call** H2020-EU.1.3.1 **Duration:** November 2016-October 2020	**EU Contribution**: € 2 853 005,40 **Website:** www.marpipe.eu	MarPipe aims to discover and further develop lead compounds with anticancer and anti-infective activity that has already been identified by the consortium from extremophilic marine microorganisms.
MG4U Marine Genomics for Users	**Call:** FP7 **Duration:** January 2011 – June 2013	**EU contribution :** € 997.826 **Website :** www.mg4u.eu	MG4U is an FP7 coordination action which aims to facilitate knowledge transfer, technology transfer, and technology translation between high-throughput marine genomics, industry and society. Marine genomics has enormous potential to improve our lifestyles and prosperity, and to assist with governance and sustainable management of the marine environment. However, many end users of marine genomics knowledge are not yet aware of how marine genomics hold great potential for problem solving and industrial commercial advantage. Valuable knowledge needs to be made accessible and disseminated in user friendly contexts. MG4U aims to spread results from recent and on-going projects in marine genomics and facilitate rapid, efficient knowledge transfer to generate interdisciplinary research capacity in Europe.
Micro B3 Microbial Biodiversity, Bioinformatics and Biotechnology	**Call** FP7-KBBE **Duration:** January 2012-December 2015	**EU Contribution**: € 8 987 491 **Website:** www.microb3.eu	Micro B3 develops innovative bioinformatic approaches and a legal framework to make large-scale data on marine viral, bacteria; archaeal and protists genomes and metagenomes accessible for marine ecosystems biology and to define new targets for biotechnological applications.

NoMorFilm Novel marine biomolecules against biofilm. Application to medical devices	**Call** H2020-EU.3.2. **Duration:** April 2015-March 2019	**EU Contribution**: € 7.651.315 **Website:** www.normorfilm.eu	This project also addresses the biosynthesis of the targeted bioactive compounds in sustainable microalgae co-cultures, diminishing cultivation costs by mimicking natural aquatic ecosystems. Most industrially interesting antibiofilm molecules will be incorporated into nanoparticles in order to develop manufacturing methodologies able to incorporate these compounds into real prosthetic devices matrixes.
Ocean Medicines	**Call** H2020-EU.1.3.3. **Duration:** December 2015-November 2019	**EU Contribution**: € 360.000 **Website:** www.oceanmedicines.eu	Ocean Medicines is a network of academic, research centres and SMEs across Europe. The aim is to establish a network of collaboration and knowledge- exchange between industrial and academic partners to further develop lead compounds from marine microorganisms having anticancer or anti-infective effects that have already been identified by the consortium.
PharmaSea Increasing Value and Flow in the Marine Biodiscovery Pipeline	**Call** FP7-KBBE **Duration:** October 2012-March 2017	**EU Contribution**: € 9.465.907 **Website:** www.pharma-sea.eu	The PharmaSea project focuses on obstacles in marine biodiscovery research, development and commercialization and brings together a broad interdisciplinary team of academic and industry researchers and specialists to address and overcome these.
PolyModE Novel POLYsaccharide Modifying enzymes to Optimise the potential of hydrocolloids for food and medical applications	**Call** FP7-KBBE-2007-2A **Duration:** May 2009-April 2013	**EU Contribution**: € 5.999.948 **Website:** http://polymode.eu	The PolyModE project convenes an international, interdisciplinary, and intersectorial consortium to identify, characterise, and optimise novel polysaccharide modifying enzymes, and to develop robust fermentation strategies for their largescale production, to exploit the potential of biopolymers for food, pharmaceutical, cosmetic, and technical applications.
SeaBioTech From sea-bed to test-bed: harvesting the potential of marine biodiversity for industrial biotechnology	**Call** FP7-KBBE **Duration:** August 2012-July 2016	**EU Contribution**: € 7 461 716 **Website:** http://spider.science.strath.ac.uk/seabiotech/	SeaBioTech is an EU-FP7 project designed and driven by SMEs to create innovative marine biodiscovery pipelines as a means to convert the potential of marine biotechnology into novel industrial products for the pharmaceutical (human and aquaculture), cosmetic, functional food and industrial chemistry sectors.
SUNBIOPATH Towards a better sunlight to biomass conversion efficiency in microalgae	**Call** FP7-KBBE-2009-3 **Duration:** January 2010-February 2013	**EU Contribution**: € 2.998.182 **Website:** http://cordis.europa.eu/project/rcn/92954_en.html	SUNBIOPATH - towards a better sunlight to biomass conversion efficiency in microalgae - is an integrated program of research aimed at improving biomass yields and valorisation of biomass for two Chlorophycean photosynthetic microalgae, Chlamydomonas reinhardtii and Dunaliella salina.
TASCMAR Tools And Strategies to access to original bioactive compounds from Cultivation of MARine invertebrates and associated symbionts	**Call** H2020-EU.3.2. **Duration:** April 2015-March 2019	**EU Contribution**: € 6.755.950,25 **Website:** http://www.tascmar.eu	TASCMAR project aspires to develop new tools and strategies in order to overcome existing bottlenecks in the biodiscovery and industrial exploitation of novel marine derived biomolecules (secondary metabolites and enzymes) with applications in the pharmaceuticals, nutraceuticals, cosmeceuticals and fine chemicals industries.

Chibio Development of an integrated biorefinery for processing chitin rich biowaste to specialty and fine chemicals	**Call:** KBBE.EU.3.4-01. **Duration:** November 2011 - November 2014	**EU Contribution**: € 2.904.425,00 **Website:** www.chibiofp7.fraunhofer.de	ChiBio project is adopting the integrative and sustainable approach of a biorefinery, i.e. the complete utilisation of crustacean shell waste by consecutive material and energetic utilisation process steps, in order to extract special chemicals.
BIOVecQ Biotechnologie marine vecteur d'innovation et de qualité/ Marine biotechnology vector of innovation and quality	**Call:** EIVP-(IT-TN) PS1.3_08. **Duration:** February 2013- May 2016	**EU Contribution**: € 1.549.790,40 **Website:** www.biovecpt.eu	The strategic project BIOVecQ (IT-TN) established a cross-border research cooperation between experts from Tunisia and Italy on seafood quality assurance and valorization using biotechnological tools. The project contributed to stronger links with the economic sector with establishing agreements with private firms to transfer scientific results to the production sector (food/cosmetic). BIOVecQ contribute also to the creation of a new Laboratory (Blue Biotechnology & Aquatic Bioproucts-B^{3}Aqua) startups and the harmonization of analytical procedures between Tunisian/ Sicilian Labs.
SecurAqua Sécurité et Qualité des Produits Aquacoles : le développement d'une voie commune tuniso-sicilienne/ Safety and quality of aquatic products: towards establishing a common Tunisian-Sicilian route	**Call:** EIVP-(IT-TN) PS1.3.020 **Duration:** January 2014- May 2016	**EU Contribution**: € 771.397.81 **Website:** www.securaqua.eu	The standard project SecurAqua (IT-TU) activities were conducted to establish the sanitary and nutritional statutes of farmed fish (marine and freshwater) and to bring innovation to sector. This project contributed to farmed products labeling, the creation of startups and the accreditation of B^{3}Aqua laboratory in INSTM-Tunisia.

Programmes and initiatives of relevance, including research and data infrastructures

EUROPEAN INFRASTRUCTURES AND INITIATIVES

- EMBRC (The European Marine Biological Resource Centre) is a global reference Research Infrastructure responding to the societal Grand Challenges through advanced marine biology and ecology research (www.embrc.eu).
- MIRRI (Microbial Resource Research Infrastructure) is the pan-European research infrastructure for microbial resources (https://www.mirri.org).
- ELIXIR is an intergovernmental organisation that brings together life science resources from across Europe. These resources include databases, software tools, training materials, cloud storage and supercomputers (https://elixir-europe.org).
- ESFRI (European Strategy Forum on Research Infrastructures) aims to identify the scientific needs for research infrastructures for the next 10-20 years in the context of the Lisbon agenda, and will have a major impact on marine research infrastructures and will play a role in Marine Biotechnology development in Europe.
- EU IBISBA 1.0 Industrial Biotechnology Innovation and Synthetic Biology Accelerator. EU-IBISBA it is an emerging ESFRI approved (2018), distributed European research and innovation infrastructure that will support industrial biotechnology and synthetic biology. The aim is to support and accelerate the uptake of industrial biotechnology as a key enabling technology for advanced manufacturing. To do this, IBISBA 1.0 will provide a distributed network of research infrastructure facilities to promote R&D in bioprocess development and support this bioeconomy KET (www.ibisba.eu).

- The European Straits Initiative (ESI) is a multilateral cooperation launched in 2009 by Pas-de-Calais County Council (France) and Kent County Council (United-Kingdom), the lead partners on the shores of Dover Strait. ESI now brings together 11 straits, representing 24 partners. ESI works towards the recognition of the specificities of European straits in current debates and the launch of structuring projects in these territories. ESI encourages exchange of experiences between partners facing similar issues, for example through European cooperation projects (http://www.europeanstraits.eu/).
- PANORAMED – Governance platform that supports the process of strengthening and developing multilateral cooperation frameworks in the Mediterranean region for joint responses to common challenges and opportunities. Panoramed will dedicate a specific call for Innovation on Blue Technology and Social Innovation themes.

Conferences

- GIM. International Symposium on the Genetics of Industrial Microorganisms. It will focus on the most recent advances in the microbial sciences related to industrially relevant microorganism as producers of bioactive molecules, of fine chemicals, of flavors, etc., and to be used as whole cells for health and wellbeing.
- SIMGBM. Congress of the Italian Society of General Microbiology and Microbial Biotechnology. Every year brings together the Italian and international experts working on different aspects of microbiology and biotechnology.
- FISV. Congress of the Italian Federation of Life Sciences. In particular topic: Environmental Microbiology and Biotechnology; Genetics of Microorganisms.
- European Congress of Biotechnology, which is held by rhe European Federation of Biotechnology (EFB), a non-profit federation of National Biotechnology Associations, Learned Societies, Universities, Scientific Institutes, Biotech Companies and individual biotechnologists working to promote biotechnology throughout Europe and beyond.
- CIESM Conference – The Mediterranean Science Commission, that organizes always a dedicated session to marine microbiology & biotechnology.
- BlueProduct. Congress on alternative ingredients production from sustainable aquatic sources: Identifying opportunities for new technologies and businesses.

EUROPEAN POLICIES

- OECD SCIENCE, TECHNOLOGY AND INNOVATION. Innovation for a sustainable ocean economy (in 2030).

MACRO-REGIONAL STRATEGIES AND PROGRAMMES

- EU Strategy for the Adriatic and Ionian Region (EUSAIR), with particular reference to the Interreg ADRION (Adriatic-Ionian) projects (https://www.adriatic-ionian.eu/).

Target sectors and groups

Intergovernmental Bodies

- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en).
- UNEP/MAP (http://web.unep.org/unepmap/).
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- GFCM (http://www.fao.org/gfcm/en/).
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).

Clusters

- Cluster Tecnologico Nazionale "Blue Italian Growth" (BIG): BIG will answer to the main social challenges regarding marine coastal environments, blue biotechnologies, renewable sources of energy from the sea, abiotic and biotic marine resources, marine robotics, within the frame of the sustainable use of the sea.
- Bio-based business/R&D: such cluster will integrate innovative biotechnological tools and processes including waste utilisation for the development of innovative aqua-food and ingredient products.
- Blue bioenergy: this will rely on alternative aquatic and sustainable bio-resources production such as microorganisms (micro-algae, bacteria and yeast) for commodity chemical and bioenergy generation.

Funding options and agencies
International Programmes - Horizon 2020. - BBI JU. The Bio-Based Industries Joint Undertaking (BBI JU) is a €3.7 billion Public-Private Partnership between the EU and the Bio-based Industries Consortium. Operating under Horizon 2020, this EU body is driven by the Vision and Strategic Innovation and Research Agenda (SIRA) developed by the industry. - Horizon Europe. - Interreg MED – 2014-2020. - Interreg-IPA.

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Workshop on Blue Biotechnology. • Creation of a transnational platform dedicated to blue biotechnology products.	**How:**	• Workshop for national and international authorities and stakeholders, to favour exchanges and to identify the topics of interest of companies and needs of consumers. • Extending existing cross-border platforms to a transnational level.
		When:	2020-2021.
Alignment and coordination	• GSO BlueMed WG. • Alignment to the Marine Biotechnology ERA-NET (ERA-MBT) Biotechnology Strategic Research and Innovation Roadmap. • 3) Alignment and coordination with IBISBA 1.0.	**How:**	Meetings, working groups and activities to define and identify priority topics and actions and to strengthen communication and institutional collaboration.
		When:	2020-2023.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach		**How:**	
		When:	
Start-Up actions	Creation of startups within Blue living labs or companies.	**How:**	EU, FAO or national funding calls.
		When:	2021.
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	Capitalization of the results from the "BIG" and "BIOVecQ" clusters regarding the areas of interest within BLUEMED.	**How:**	Workshops and meetings.
		When:	2020-2023.
Lobbying actions	Actions to highlight the importance of Blue Growths and Biotechnologies, also by promoting new dedicated calls within EU and Regional Initiatives.	**How:**	Workshops and meetings.
		When:	2020-2023.
Training and capacity building initiatives	Training course on Blue Biotechnologies and Blue Bio-economy also aiming at the creation of blue careers.	**How:**	Organisation and/or participation to training courses.
		When:	2020-2021.

FICHE 9

PROMOTE THE ROLE OF MARINE RENEWABLE ENERGIES (MRE) IN THE ENERGY TRANSITION PHASE

CO-CHAMPION COUNTRIES: FRANCE & TURKEY

Background

Though the Mediterranean Sea is a vast territory, several characteristics applies to it as a whole:

- Deep water even close to the shore.
- Very small tidal range and then low tidal currents (except in localised corridors).
- Many islands.
- Inhomogeneous winds distribution with localized strong wind areas.
- Evaporation basin, high amount of solar energy.

The blue energy sub-sectors that constitute a real opportunity for the Mediterranean Sea are the floating offshore wind and to a lesser extent the wave and tidal (hydrodynamic current) energies:

- Offshore Wind Energy (OWE), with bottom-fixed Wind Farm technology up to now, is the fastest growing activity in the blue economy in Europe. Among it Floating Offshore Wind Technology (FOWT) that can be deployed in Mediterranean deeper waters, has made MRE a breakthrough innovation market.
- Wave and tidal Energy: progress has been made as regards these energies demonstration. Production systems could be deployed locally, particularly for insular territories.

These two areas of MRE are very different economically:

- OWE (Offshore Wind Energy) have reached maturity: tens of billions of dollars / Euros are invested every year in the world for OWE, which allows to produce this energy at competitive costs (about 50 € / MWh) thanks to the experience curve of these technologies.
- Other oceanic MREs (waves, tidal, etc.) have been in the demonstration phase for a long time and the objective is to reduce their operating costs so that they can be applied to specific territories (islands).

It is also important to analyze the potential co-activities of MREs for designing integrated multi-purpose platforms that can serve both wind and other sectors, including aquaculture and bioenergy, for example with fisheries and aquaculture, particularly IMTA.

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, harbour and shipping industries, tourism, maritime surveillance, fishing and aquaculture. MRE are expected to have a great impact in terms of economic development, jobs and well-being of citizens.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

European collaborative projects funded by INTERREG-Med, H2020 or Med-Maritime Integrated programs are very active in related countries. They tackle various relevant challenges linked to promotion, knowledge sharing and key R&D barriers that the marine renewable energy sector is currently facing.

Some of these European collaborative projects have more of a promoting goal: for example BLUENE aims to contribute to the Blue Growth by enlightening economic opportunities generated by marine resources, ENERCOAST aims at identifying technical and non-technical solutions to increase the use of renewable energy sources technologies in marine-coastal areas, PELAGOS targets the creation of transnational Mediterranean innovative cluster in blue energy, which would be composed of seven national clusters while PRISMI promotes renewable energy sources integration for smart Mediterranean islands and MAESTRALE aims to broaden the sharing of knowledge among scientists, policy makers, entrepreneurs and citizens and encourage effective measures and investments for the blue growth.

Other European collaborative projects are more R&D-focused: they usually deal with one specific R&D aspect that is key for the future development and commercialization of blue energy technologies. For example, OSMOSE, DREAM and TILOS work on the smart electrical grid needs: OSMOSE aims for the development of an optimal system-mix of flexibility solutions for European electricity while DREAM laid the foundations for a novel "heterarchical" management approach of complex electrical power grids, providing new mechanism for consumer involvement in economic and ecological electricity use as well as stable and cost effective integration of distributed renewable resources. TILOS focuses more on smart grids for insular territories as it aims at demonstrating the optimal integration of local scale energy storage in a smart island micro grid that will also communicate with a main electricity grid in order to fully integrate renewable energy sources to the power system. Other projects focus on new concepts such as multi-purpose floating offshore systems (REPOS), modular steel jacket for offshore wind farms (JABACO) and innovative meteorological mast platform (FLOATMASTBLUE). On their side, MARINET and DTOCEAN PLUS aims at providing easier access to R&D tools, as they respectively target research infrastructure integration and easy access and design tools availability.

COCONET – towards COast to COast NETworks of marine protected areas (from the shore to the high and deep sea), coupled with sea-based wind energy potential (FP7 project). Other projects concerning big data management should be highlighted too. These projects focus on the observation of social, physical, biological and chemical parameters of Mediterranean seas in order to develop accurate management systems to increase the effectiveness and mitigate potential impacts of offshore renewable energy investments.

To be noted that the European Union, via for example its H2020 SME Instrument's project also finances projects developed by SME's. This is the case of Ideol in France with its Leadfloat project, Nautilus in Spain which both worked on a type of floating foundation for floating offshore wind turbine and iReact project developed by EMTECH Diastimiki, which is a smart-grid component to facilitate automated reactive load compensation in power distribution substations for Offshore and Onshore Renewable Energy Sources.

Although the EU finances many projects linked to the blue energy sector, it is key to point out that several projects are also led at national level only. This is the case for example of E-Wave in Cyprus, a project which was developed by the Oceanography Centre of the University of Cyprus and which studied the wave energy potential. In Turkey a nationally pilot project on wave energy has been established in Zonguldak (Black Sea). In France, France Energy Marine has launched and managed more than 30 R&D projects since 2012 through 4 research programs.

Another type of projects that cannot be left aside given their significant impact on the blue energy sector development in Europe are demonstration projects and pilot farms.

For what relates to the floating offshore wind sector, we can count 4 pilot farms in France, 1 in Portugal and 2 in Spain that should be in operation in the coming years: 3 of these pilot farms are located in the Mediterranean Sea (off the French coast in Gulf of Lion).

MISTRAL Mediterranean Innovation STRAtegy for transnational activity of clusters and networks of the Blue Growth.

MISTRAL_Marine Renewable Energies: https://mistral.interreg-med.eu/

PELAGOS. PELAGOS aims to establish a transnational Mediterranean Cluster in Blue Energy (BE) to accelerate the development of BE sector in Mediterranean coastal, insular and marine regions. https://pelagos.interreg-med.eu/

PHAROS4MPAs - A review of solutions to avoid and mitigate environmental impacts of offshore windfarms R https://pharos4mpas.interreg-med.eu/

PROJECT	DESCRIPTION		OBJETIVES
BLUENET Creating new life for discarded fishing and aquaculture gears to prevent marine litter generation	**Call:** EASME/ EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01/02/2018 - 31/07/2020	**EU Contribution :** 550.691,00 € **Website :** https://www.bluenetproject.eu/	BLUENET will set up a programme for recycling abandoned, lost or discarded fishing and aquaculture gear: recovering gear from the sea and using it as raw material to manufacture new gear. Spain and Italy
ENERCOAST Renewable energies in the marine-coastal areas of the Adriatic- Ionian region	**Call:** Interreg MED Programme	**EU Contribution :** 289.000,00 € **Website :** http://www.medmaritimeprojects.eu/section/enercoast	The specific objective of the ENERCOAST project is to obtain clear proposals on how to contribute to the Blue Growth with emphasis on technical and economic activities of blue energy in the Adriatic-Ionian marine-coastal are such as: solar radiation, wind power, wave and tidal current power and sea water thermal energy to be used in heat pumps.
PELAGOS Promoting Innovative NEtwork Sand CLusters Form Arine Renewable Energy SynerGies In Mediterranean COasts And ISlands	**Call:** Interreg MED Programme **Duration:** 01/11/2016 – 30/04/2019	**EU Contribution :** 2.042.200,00 € **Website :** https://pelagos.interreg-med.eu/	PELAGOS targets the creation of transnational Mediterranean innovative cluster in blue energy, which would be composed of seven national clusters.
PRISMI Promoting RES Integration for Smart Mediterranean Islands	**Call:** Interreg MED Programme **Duration:** 01/11/2016 – 30/04/2019	**EU Contribution :** 509.637,06€ **Website :** https://prismi.interreg-med.eu/	PRISMI promotes renewable energy sources integration for smart Mediterranean islands.
MAESTRALE	**Call:** Interreg MED Programme **Duration:** 01/11/2016 – 30/11/2019	**EU Contribution :** 2.046.311,25€ **Website :** https://maestrale.interreg-med.eu/	The project Maestrale intends to lay the basis for a Maritime Energy Deployment Strategy in the Mediterranean. Based on a survey of existing and innovative technologies, hindrances and potentials in participating countries, it aims to widen knowledge sharing among scientists, policy makers, entrepreneurs and citizens and prompt effective actions and investments for blue growth. Notwithstanding the large number of academic and technical studies in the field of renewable blue energy, there is a lack of concrete initiatives and operating plants in the MED area. To fill this gap, project partners will cooperate to detect maritime renewable energy potentials in participating countries as regards their physical, legal, technological, economic and social contexts. Among the issues to be faced, there are environmental sustainability, technological innovation, acceptability by citizens, and possible conflicts with marine ecosystems.

OSMOSE Optimal System-Mix Of flexibility Solutions for European electricity	**Call:** H2020-EU.3.3.4. **Duration:** 01/01/2018 – 31/12/2021	**EU Contribution :** 21 852 098,69€ **Website :** https://www.osmose-h2020.eu/	OSMOSE aims for the development of an optimal system-mix of flexibility solutions for European electricity. OSMOSE proposes four TSO-led demonstrations (RTE, REE, TERNA and ELES) aiming at increasing the techno-economic potential of a wide range of flexibility solutions and covering several applications, i.e.: synchronisation of large power systems by multiservice hybrid storage; multiple services provided by the coordinated control of different storage and FACTS devices; multiple services provided by grid devices, large demand-response and RES generation coordinated in a smart management system; cross-border sharing of flexibility sources through a near real-time cross-border energy market.
DREAM Design for Resource and Energy efficiency in cerAMic kilns	**Call:** H2020-EU.2.1.5.3. **Duration:** 01/10/2016 – 30/09/2019	**EU Contribution :** 21 852 098,69€ **Website :** https://www.spire2030.eu/dream	DREAM laid the foundations for a novel "heterarchical" management approach of complex electrical power grids, providing new mechanism for consumer involvement in economic and ecological electricity use as well as stable and cost effective integration of distributed renewable resources.
TILOS Technology Innovation for the Local Scale, Optimum Integration of Battery Energy Storage	**Call:** H2020-LCE-2014-3 **Duration:** 01/02/2015 - 31/01/2019	**EU Contribution :** 11,008,623€ **Website :** http://www.tiloshorizon.eu/	The TILOS project is testing the integration of an innovative local-scale, molten-salt battery ($NaNiCl_2$) energy-storage system in the real grid environment on the island of Tilos (Greece). It is planned to test smart grid control system and provision of multiple services, ranging from microgrid energy management, maximisation of RES penetration and grid stability, to export of guaranteed energy amounts and provision of ancillary services to the main grid. The battery system is used to support both stand-alone and grid-connected operations, while ensuring its interoperability with the rest of microgrid components and demand side management.
JABACO Development of modular steel jacket for offshore windfarms	**Call:** European Union Research Fund for Coal and Steel **Duration:** 01/07/2015-31/12/2018	**EU Contribution :** 1.429.196€	Aim of JABACO is to develop a Modular Jacket concept composed by components of pre-qualified quality, for cost reduction of offshore wind farms. The concept is based on an integrated design considering water depths 30-80m, turbine sizes 5-10 MW, in the North Sea and the Mediterranean. Design of basic six cases, tests and numerical simulations of structural components conducted together with a sensitivity analysis. Deliverable is the "JABACO manual", containing procedure / recommendations for modular jacket design and the six case studies optimized, which will define apathway to lowering cost of energy for upcoming offshore wind farms in European waters.
FLOATMASTBLUE Offshore Wind Energy Cost Reduction by an Innovative Floating Met Mast Platform	**Call:** H2020-EU.3.2.5. H2020-EU.3.2.3. H2020-EU.2.3.1. **Duration:** 01/12/2017-30/11/2020	**EU Contribution :** 2.048.567,51€ **Website :** http://www.floatmast.com/	FloatMast is a floating platform that performs the best wind data measurements for the most promising and advanced Blue Energy activity, Offshore Wind Parks (OWPs). These wind measurements are vital for the cost benefit analysis of OWPs as they are used in the estimation of the annual income.

MARINET 2 Marine Renewable Infrastructure Network for Enhancing Technologies	**Call**: H2020-EU.1.4.1.2. **Duration:** 01/01/2017-30/06/2021	**EU Contribution :** 10.592.285,23€ **Website :** http://www.marinet2.eu/	Integrating activities planned under MaRINET 2 build upon the achievements of the advanced community created in MaRINET FP7. MaRINET 2 will ensure the continued integration and enhancement of all leading European research infrastructure and facilities specialising in research, development and testing of offshore renewable energy systems including electrical sub systems and grid integration through a range of TRLs (1-7). MaRINET FP7 proved the added value of uniting these facilities, and substantially improving their capability as a community of practice to deliver consistent testing services ensuring, quantifiable, stepwise innovation and progress in the development of devices and key components, and identifying critical areas for further technical investigation and enhancement.
DTOCEAN PLUS Advanced Design Tools for Ocean Energy Systems Innovation, Development and Deployment	**Call**: H2020-EU.3.3.2. **Duration:** 01/05/2018 - 30/04/2021	**EU Contribution :** 6.689.076,50€ **Website :** https://www.dtoceanplus.eu/	Ocean Energy can play an important role in addressing one of the EU's biggest challenges: providing clean, affordable and sustainable energy. However, ocean energy technologies are not yet mature enough to overcome all challenges related to performance, reliability, survivability, and resulting cost of energy. DTOceanPlus will accelerate the commercialisation of the Ocean Energy sector by developing and demonstrating an open source suite of design tools for the selection, development, deployment and assessment of ocean energy systems (including sub-systems, energy capture devices and arrays). This will align innovation and development processes with those used in mature engineering sectors.
COCONET Towards COast to COast NETworks of marine protected areas (from the shore to the high and deep sea), coupled with sea-based wind energy potential	**Call**: FP7-KBBE **Duration:** 01/02/2012 - 31/01/2016	**EU Contribution :** 9.000.000€ **Website :** https://cordis.europa.eu/project/id/287844/reporting	CoCoNet focused on the Mediterranean and the Black Seas and its objectives were the production of: 1- Guidelines for the institution of networks of Marine Protected Areas (MPAs); 2 - Smart Wind Chart evaluating the feasibility of Offshore Wind Farms (OWFs). Both objectives call for the identification of spatially explicit marine units where the management of human activities (both in terms of protection and in clean energy production) is based on the features of natural systems, as both the ecosystem approach and marine spatial planning require. Desk-based and field studies (carried out in two pilot areas) identified these natural units as Cells of Ecosystem Functioning (CEFs): portions of the water column that are more connected with each other than with other portions. This novel concept is based on connectivity and will prove useful for any planning of the use of marine space. The data gathered during the project are stored into a multi-layered Geodatabase, an essential platform to achieve full awareness of the natural and socio-economic features of the marine environment.

FLOATGEN Demonstration of two floating wind turbine systems for power generation in Mediterranean deep waters	**Call**: FP7-ENERGY **Duration:** 01/01/2013 - 31/12/2016	**EU Contribution :** 19.568.404€ **Website :** https://floatgen.eu/	The objective of the FLOATGEN project is to demonstrate the technical and economic feasibility of two different multi-megawatt integrated floating-wind turbine systems in deep waters, never applied before to Mediterranean Sea conditions, in order to extend deep offshore wind resources and demonstrate decrease of costs for electricity generation down to competitive level. The project will also assess, compare and obtain conclusions about performance of suchtwo different combinations of wind turbine and floating structure technologies to get the knowledge to improve performance of the future replication projects of these technologies.
LEADFLOAT Leading the Floating Wind Market Development	**Call**: H2020-EU.3 H2020-EU.2.3. H2020-EU.2.1 **Duration:** 01/10/2018 - 30/09/2020	**EU Contribution :** 2.498.562,50€ **Website :** https://www.ideol-offshore.com/en/leadfloat	IDEOL, a French SME created in 2010, has emerged as one of the few international leaders in floating wind, with two demonstrators built in France and Japan, relying on its patented floating platform technology, the most cost competitive solution in the market. Its team, composed by more than 40 engineers, is globally recognized as one of the best technical team with a unique know-how and innovative approach. IDEOL is already engaged in different pre-commercial and commercial projects in France, Japan and California. It is the only European technology provider and the only foreign company having convinced the Japanese government and experts. LEADFLOAT aims to impose IDEOL's solution as the market leader of floating wind by keeping its cost competitiveness advantage, leveraging on its demonstrators' return of experience and securing early market share in key markets. It will contribute to keep Europe ahead and to positions its industry on the top of the new emerging floating-wind market over the competition from US and Japan.
E-wave	**Duration:** 03/01/2011 - 26/01/2010	**Website :** http://www.oceanography.ucy.ac.cy/ewave/	The development of an integrated, high resolution system for monitoring the energy potential from sea waves at the Exclusive Economical Zone (EEZ) of Cyprus coupled with the well established Cyprus Coastal Ocean Forecasting System (CYCOFOS).
MISTRAL Mediterranean Innovation Strategy for transnational activity of clusters and networks of the Blue Growth	**Call**: Interreg-MED 2014-2020 **Duration:** 48 months	**EU Contribution:** 4.100.000€ **Website:** https://mistral.interreg-med.eu/	to promote and make effective a transnational BG ecosystem of innovation where SMEs and corporate, RTOs, higher education institutions, public sector, cooperate to: • Develop sustainable innovation actions, • Increase their innovation performance, • Sustain the development of the entrepreneurial spirit, • Increase the access and sharing of the marine knowledge.

PHAROS4MPAS Blue Economy and Marine Conservation: Safeguarding Mediterranean MPAs in order to achieve Good Environmental Status **SRIA Action:** E2.3 / E2.8	**Call:** Interreg MED Programme 2014-2020 **Duration:** December 2017 - May 2019	**EU Contribution:** 1.179.496,57 € **Website:** https://pharos4mpas.interreg-med.eu/	The general objective of the PHAROS4MPAs project is to enhance management effectiveness and networking for Mediterranean MPAs, in order to contribute to the conservation of marine biodiversity and natural ecosystems, taking into account the complex ensemble of human activities developed within the Blue Growth perspective and their interaction with protected areas and marine ecosystems. Project outputs include delivering common capitalization baselines, recommendations and policy tools adapted to appropriation by the MedPAN network, MSP authorities, the European Commission, the Barcelona Convention and the various maritime sectors.

Programmes and initiatives of relevance, including research and data infrastructures

INTERNATIONAL PROGRAMMES AND INITIATIVES

- **The 2030 Agenda for Sustainable Development 2016-2030** – Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all.
- **The Atlantic Strategy** – reduce Europe's Carbon Foot Print through offshore renewable energy and associated energy grid.
- UfM Ministerial Declaration on Blue Economy (2015; a new one upcoming in 2021)
  https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf
  UfM Ministerial Declaration on Environment and Climate Change" (2014; a new one upcoming in 2020)
  https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf
- UfM Working Group on Blue Economy
  https://ufmsecretariat.org/ufm-working-group-blue-economy/
- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects
  https://ufmsecretariat.org/what-we-do/water-environment/

EUROPEAN PROGRAMMES AND INITIATIVES

- **Renewable Energy Directive of the European Union –** (2008, renewed in 2014), to reach 27% share of renewable energy consumption in 2030. Energy generated by offshore wind power has gained increasing importance in the EU as well as worldwide.
- **European Strategic Energy Technology Plan (SET PLAN)** aims to accelerate the development and deployment of low-carbon technologies. It seeks to improve new technologies and bring down costs by coordinating national research efforts and helping to finance projects. Concerning FOWE (Floating Offshore Wind Energy), SET Plan targets in its declaration of Intent to develop "cost-competitive integrated wind systems, including infrastructure that can be used in deeper waters (>50 m) at a maximum distance of 50km from the coastline with a level energy cost of less than € 120/MWh by 2025 and less than 90€/MWh by 2030, in the interest of cost competitiveness. Given the great dynamics of development of this energy worldwide it is likely that these cost targets will be achieve more quickly and will continue to lower to reach the costs of the bottom-fixed Wind Farm, e.g. around 50€/ MWh https://setis.ec.europa.eu/system/files/setplan_wind_implementationplan_0.pdf
- **European Regional Development Fund** – supports regional and local development by co-financing investments in energy and transport infrastructures.
- **Cohesion Fund** – encourages investments, especially in the field of trans-European transport networks and investments related to energy benefiting to the environment in terms of energy sufficiency:
  - Promotes the production, distribution and use of energy derived from renewable sources;
  - Supports energy efficiency and smart energy management.
- **Bioeconomy Strategy** – addresses the production of renewable biological resources and their conversion into vital products and bio-energy.
- **EU Blue Growth Strategy** – supports sustainable growth in the marine and maritime sectors as a whole. One of its objectives focuses on ocean energy.

Target sectors and groups

The main objective is to produce energy at competitive costs (about 50 € / MWh), especially for OWE and at competitive costs for other MRE (waves, tides, marine bioenergy) in specific areas where the energies are expensive, as in the islands. These MREs must be accepted as new activities at sea, where there are many historical actors, and to have acceptable impacts on ecosystems (marine ecosystems, avifauna).

As a result, MREs will have a **direct and significant impact** on other key sectors of blue growth such as the **port and maritime industries, tourism, maritime surveillance, fisheries and aquaculture.** MREs should have a **significant impact in terms of economic development, jobs and citizens' well-being.**

Target groups and stakeholders can be classified in different kinds of entities: **companies, public authorities, associations, professional and support organizations, which help the development of innovation.** It is hence a very wide category and the project partners from the Mediterranean countries under study reference heterogeneous actors. However, some tendencies can be highlighted.

Target groups and stakeholders of the Blue Energy are mainly evaluated with medium relevance for the development of the sector and a medium-high readiness level. These actors have an important role to play in the innovation in this area.

For countries with less maturity in the field of MREs, **public authorities** are the key stakeholders to target. For countries with a higher MREs maturity level, the target groups will rather include **private entities** such as companies and professional networks/ associations. It is a good projection of the market maturity and potential: in countries where there are fewer opportunities, private entity does not yet seize markets.

The most important target groups are those of the company's energy ecosystem.

This ecosystem includes actors from several categories that are sometimes different depending on the country: in particular in the European countries, there are no longer state-owned companies while in other countries this sector is nationalized.

We can mention the following actors:

- **Energy operators** (two main categories):
  - Most of them are energy operators with long-standing positions in the field of fossil fuels (oil, gas, coals... Nuclear, hydroelectricity...). These operators exist in each Med country:
    - France: EDF, ENGIE, TOTAL;
    - Spain IBERDROLA, UNION FENOSA;
    - Greece IED;
    - Italy ENEL, EDI POWER;
    - Portugal: EDP;
    - Turkey: EÜAŞ (Elektrik Üretim A.Ş.)
    - Etc...
  - We notice the emergence of more recent alternative energy operators, especially in the field of renewable energies:
    - Sometimes they are subsidiaries of the groups mentioned above such as EDF Energies Nouvelles in France;
    - Other times they are new companies: Quadran Marine Energies.

- **Managers of electrical networks:**
  - Managers of electricity grids are important because renewable energies, which are by their nature highly distributed, involve new networks, such as RTE in France.
- **Energies unions:**
  - Unions or federations represent operators and lobby at national and European level. For example, in France: France Energie Eolienne (FEE), the Union of Renewable Energies (SER), etc.
- **Engineering of energy.**

Environmental NGOs also have a growing influence in the field as they promote more and more "green energies" such as WWF.

The European Parliament and the European Commission also have a prominent role in the domain. All these actors mentioned above can play an important lobbying role with European authorities.

Funding options and agencies

Investments in renewable energy depend on countries' energy policies. MREs are part of these policies and are related to natural features and supporting industries, mainly energy and maritime, in these countries.

European policy provides guidance in this area and projects: R & D, demonstration, cooperation between interested countries (e.g. MED) contribute to strengthening the implementation of MREs.

Currently the technologies are generally mature but there is still research and innovation needed to reduce the LCOE so that these energies are competitive and less and less subsidized by public budgets.

The large-scale demonstrators are being tested; they have been helped by European funds. It is no longer necessary to launch new demonstrators. On the other hand, it is necessary to share the results of these experiences between the potentially interested countries.

Resources/ funding

Despite the strong commitment of the EU through its funding programs and the investment of some countries, there is a lack of funding for Blue Energies.

It is needed to have public funds targeting the economic development and sustainability of the technologies, in order for them to become cost-competitive.

In fact, it is key to note that the current scheme of national financing of commercial plants, such as offshore wind energy commercial plants in France, is controversial. In fact, the French government does not directly subsidise the commercial projects, however it commits to buy the produced electricity at a price higher than the current electricity market: although it has yet to be confirmed for the FOW commercial plants in the Mediterranean Sea, the committed buying price would be in the range of 90-120 €/MWh, which is 40 to 70€/MWh greater than the 50 €/MWh current market price. This constitutes a significant cost for the state, and behind it, taxpayers.

Consequently, public national financing should grand projects working on cost-reduction and cost-competitiveness of MRE, otherwise the subsidy bill for commercial plants (once in operation) will be tremendous. By enabling MRE to become cheaper, through innovation and economies of scale, funding of new commercial plants will be more affordable.

There is also a need for funding in order to assess the environment interaction and impact of MRE to improve public acceptance. A need for new and adapted infrastructures to the development of MRE has been expressed (for ports especially).

- Funds come mainly from the EU. National or regional governments could develop funding plan as well in that sector. National initiatives could be as well tax incentives
- Possibility to enhance private funding though investor confidence reinforcement (ref. policies);
- Governments have to have clear communication on the available funds and political intent.
- Investment funds could come European Bank or World Bank or other investment bank specially for non-EU countries.

Access to funding

The public commitment will stimulate private investment and foster a long-term investors' confidence for the future of marine energy industry in MED. The countries in which investments were first and most important (Germany, Netherland, Denmark, the UK and more recently France) have changed their legislation to facilitate investment in offshore wind farms. This change is mainly about the risk reduction of investors (energy specialists) who respond to the call for tenders. This risk reduction is based on the fact that the Public authorities give the tender specifications full knowledge of the initial states (soil, wind, environment, etc.). Thus investors do not take a margin for risks. As MRE are at different stages of development, those investments are expected to finance from the early stage devices, to pilots, large scale demonstrators and commercial farms installation.

They are also required to de-risk the technologies that will be deployed at a commercial stage. In most of the European countries where MRE are currently developed/ under development, national public calls for projects were launched (England, France, Germany and Portugal). Time will be finally necessary to the production price as the experience curve (Boston Consulting Group) demonstrates: "company's unit production costs would fall by a predictable amount—typically 20 to 30 percent in real terms—for each doubling of "experience," or accumulated production volume".

- **Horizon 2020** – especially under Pillar 3 'Societal Challenges' with the 'secure, clean and efficient energies' thematic;
- **Horizon Europe** – in particular under Pillar 2 'Global challenges and Industrial Competitiveness' – Cluster 'Food and natural resources'; Cluster 'Climate, Energy and Mobility' and within the Mission 'Healthy Oceans, Seas, Coastal and Inland Waters';
- **Interreg** – through dedicated and specific calls;
- **Union for the Mediterranean**;

- **UNEP/MAP**;
- **JPI Oceans**;
- **European Investment Bank**;
- Private foundations;
- Competent ministries and regional/local authorities through specific calls and the development of national funding plans for MREs;
- Maritime cluster:
    - European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/),
    - Pole Mer Mediterranee (https://www.polemermediterranee.com/).

Activities to promote the SRIA Implementation

Gaps to address

Based on the situation of MRE advancement in Europe, the main gaps currently constituting a barrier to further and smoother development of the blue energy sectors can be identified.

Policies

In order to reinforce investors' confidence and allow stakeholders of the blue energy value chain to keep committing to this sector, governments should provide a clear view on their capacity ambition, project pipeline and supporting policies in their National Energy and Climate Plans (NECPs) to 2030. This would provide regulatory certainty concerning planning, design criteria and characterization of concession areas.

In the most mature countries, the government should publish a long-term calendar of the next calls for bids, which should present a significant number of coming bids, well spread in time, with sufficient capacity requirement (for example minimum 500 MW per FOWE project) to optimize connection grid and enable stakeholders to make out future economies of scale.

In countries where the blue energy sector is not as mature, it is a key that governments show their will to evaluate available marine renewable resources, proceed with mapping and characterisation of concessions areas as this would be a good start to boost the blue energy sector.

Furthermore, the governments should coordinate their schedules of deployment and supporting policies for MRE in order to maximise regional cooperation in the development of a European supply chain.

All these policy measures would allow operators and manufacturers to consider positioning themselves, plan for investments and size their production tool accordingly. Electricity distributors could also anticipate grid connection investments.

It will also be key that governments work to improve public perception about the growing share of renewable energies in household's electricity bills and justify the fact they bid on renewable energies, which currently remain more expensive than other sources of energy such a nuclear energy in France.

The national and European regulators could also work on defining ways of solving potential conflicts about use of maritime space (ref MSP).

Finally, at European level, additional funding instruments should be earmarked to provide access to low cost financing for pilot projects and increase the funding to research and innovation focused on cost-competitiveness. Some already exist, as for example the NER 300 European programme, which is endowed with 300M€ and targets demonstrators. It has granted Floatgen in France and Windfloat Atlantic in Portugal.

Skills/ Human Resources

Despite the fact that different training courses exist with competences and expertise already available, there are gaps to address. As seen in the previous section, they are few training courses available that are fully dedicated to MRE sector.

We need more partnership in Med between research organizations and industry, and more Clusters such as competiveness clusters (ex Pole Mer Mediterranéee).

Students should experience both research and industry during our education.

It is relevant to capacity building in next EU initiatives.

MRE training courses are needed to convert these previous skills to the requirements of MRE projects and to acquire specialised skills that are needed for those specific technologies and infrastructures.

Concerning professional lifelong learning, there is a lack of professional courses and qualifications (no high-degree but more technicians and qualified workers). We can also underline specific needs concerning skilled welders and electrician workers for offshore platform.

A dedicated competence & training centre at EU level to support the development of marine energies could be envisioned to have shared qualifications.

Finally, skills and an exchange of experience is required for the development of soft competences to enable the dialogue between the stakeholders and facilitate the decision to implement MRE project.

Research & Development

There are still many topics on which research must be done and for which innovation must be developed. Some of these R&D needs are technological but a number of them are not.

The main technological stakes are:

- Overall cost reduction;
- Connection to the electricity grid;
- Connection between turbines and the substation;
- Electricity system flexibility and storage: allowing MRE which is intermittent by nature (in particular wind energy) to be integrated;
- Suitability of the anchors and foundations to the surrounding environment: to reduce the cost of anchoring and maintaining MRE systems, it is necessary to develop and adapt MRE systems to the specificities of the locations (current, waves, nature of the sea floor, soil etc.) with solutions allowing rapid and safe interventions;
- Performance of production systems;
- Resistance of MRE systems in rough marine conditions: materials must be adapted to resist against corrosion and marine biofouling;
- Reliability and affordability of submarine electrical connection solutions;
- Protection, stability and accessibility of submarine cables;
- Optimization of the processes and means of installation and maintenance works: this is will require solutions adapted to the management of port infrastructures and the associated logistical means but also, for example, the tools that will allow to plan interventions to reduce the costs of preventive maintenance operations;
- Adaptation of shipyards and ports.

The main non-technological stakes are:

- Estimation of exploitable resources and predictability of electricity production;
- Environmental impacts and interaction;
- Socio-economic impacts and cross-sectorial interaction;
- Safety and security of construction, installation, maintenance and dismantling procedures.
- The acceptability of citizens who are doubtful or even reluctant to these energies, because there is a lack of knowledge of the impacts.
-

Given the technologies adapted to the Mediterranean context are still at early stage of development, R&D is still a key enabling driver of their further advancement and commercialisation.

The emphasis must also be made on demonstration projects, which enables to anticipate potential challenges and to involve additional players in the game while constituting a showcase for the industry.

Marketing

There is a lack of marketing actions in the different countries and a lack of awareness about Marine Renewable energies in general and this concerns the different stakeholders: Industries, Research and academics actors, Policy makers and the civil society.

To cover this gap, significant communication campaigns are needed to increase public understanding and facilitate the acceptance of MRE projects. Research results regarding MRE industry impacts on the environment should be notably published in order to facilitate acceptance by local communities.

Marketing, communication to public authorities and publicity are indicated as very influential and impactful factors for future developments in MRE.

<table>
<tr><th colspan="4">Activities to promote the SRIA Implementation</th></tr>
<tr><th>Examples of activities

[Champion countries must choose those activities that suit best the priority addressed]</th><th>Content and objective

[Champion countries describe in more detail the content and specific objective of a given activity]</th><th colspan="2">How and timeframe

[Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]</th></tr>
<tr><td rowspan="2">Networking and engagement of economic sectors and national Blue Growth communities</td><td rowspan="2">1) Develop more partnerships between research organizations and industries through clusters organization;
2) Exchange and cooperation in experience skills through tools such as transnational clusters;
3) Mediterranean Conference dedicated to MREs: last lessons learned from existing projects, harbour infrastructures and on-shore solutions supporting deployment, innovations in grid and electrical connections, win/win deal for the environment, innovations in methods and key components, financing and insuring commercial-scale farms.</td><td>How:</td><td>1) Building national clusters in countries deeply interested by MREs;
2) Creation of a Mediterranean transnational cluster with a focus on MREs;
3) Organisation of a Conference dedicated to MREs at Mediterranean level.</td></tr>
<tr><td>When:</td><td>1) 2020-2023.
2) 2020-2023.
3) Each year from 2021.</td></tr>
<tr><td rowspan="2">Alignment and coordination</td><td rowspan="2">Alignment with climate change and energy European policy.</td><td>How:</td><td>Strengthening dialogue with EU institutions and participation of MREs stakeholders to relevant events/ workshops/meetings/activities taking place in Brussels in the field of climate change and Energy policy.</td></tr>
<tr><td>When:</td><td>2020-2023 according to the agenda.</td></tr>
<tr><td rowspan="2">Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a “variable geometry” approach</td><td rowspan="2">Development of multi-purpose platform to ensure an optimal use of marine space and to reduce both ecological footprint and cost of marine activities. Example: deployment of multi-use platforms integrating wind energy, combined with desalination and potentially aquaculture.

These new solutions can also combine green energy production with offshore research (scientific observation and continuous measurements), marine life and environmental monitoring, maritime surveillance and pollution monitoring.</td><td>How:</td><td>Brainstorming meetings and answering dedicated regional, national or European calls.</td></tr>
<tr><td>When:</td><td>Starting 2021.</td></tr>
<tr><td rowspan="2">Start-Up actions</td><td rowspan="2"></td><td>How:</td><td></td></tr>
<tr><td>When:</td><td></td></tr>
</table>

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Lobbying actions	1) Actions to encourage national governments to provide a clear view of on their capacity ambition, project pipeline and supporting policies in their National Energy and Climate Plans to 2030; 2) In MREs most mature countries, encourage governments to publish a long-term calendar of the next calls for bids, which should present a significant number of coming bids, well spread in time, with sufficient capacity requirement; 3) In countries where the blue energy sector is not as mature yet, encourage governments to evaluate available marine renewable resources, proceed with mapping and characterisation of concessions areas; 4) **Actions to highlight the importance of MREs within the Horizon Europe** Pillar 2, Cluster "Climate, Energy and Mobility" and within the Mission of Healthy Oceans, Seas, Coastal and Inland Waters, and to **promote dedicated calls. These specific calls would enable, at a large scale, the in-depth study and analysis of MREs' interactions with natural habitats:** • Develop a socio-ecosystem approach to the environmental and socio-economic impacts of floating wind farms; • Identification of the physical-biological coupling in the modifications induced by the MRE projects on the habitats. Instrumentation adapted to the monitoring of physicochemical and biological parameters. Modelling the reef effect locally and globally. Modelling the interactions with avifauna.	**How:**	1) Relevant actions and discussions to lead with competent national and regional authorities; 2) Idem; 3) Idem; 4) Dedicated meetings and participation to relevant working groups. - Research studies and experimentations with innovative sensors adapted to MRE platforms in network, and exchanges between such national platforms.
		When:	1) 2020-2023. 2) 2020-2023. 3) 2020-2023. 4) 2020-2023.
Training and capacity building initiatives	1) Develop new training courses fully dedicated to MREs following a schedule that is correlated with industrial development (2021?) 2) Build bridges for students so they can experiment both research and industry during their education; 3) Support professional lifelong learning (professional courses and technician qualifications);	**How:**	Creation of a **dedicated competence and training centre at EU level** to support the development of marine energies and shared qualifications.
		When:	2021.
Implementation Working Groups (IWG) on specific sectors		**How:**	
		When:	
Communication and engagement	Mediterranean Conference dedicated to MREs (mentioned above). Public information on environment impacts from the MRE.	**How:**	Organization of a conference.
		When:	Once a year, starting 2021.

FICHE 10

OPEN DATA, OPEN SCIENCE, OPEN INNOVATION

CO-CHAMPION COUNTRIES: FRANCE, MALTA & TURKEY

Background

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.

Especially in the Mediterranean, Blue Growth therefore demands for a holistic approach, integrating oceanic dynamics, knowledge on ecosystem functioning, economy and societal needs. Open innovation, open data and open science are a key dimension to achieving blue growth. Technological development is making a great impact on Blue Growth especially through the use of artificial intelligence (AI), Internet of Things and the infrastructural backbone of Blockchain to create and network innovative products, and support the marine sector with smart and intelligent applications.

Open innovation is a way for companies to benefit from external ideas/technologies (Outside-In) and valorise internal ideas/technologies with external partners (Inside-Out) to reduce the financial risks associated to innovation, and quickly get a competitive advantage. As such it implies accelerating internal R&D and innovation along value chains through collaboration between the technological supply - and demand – side. Open innovation needs to be operational and this is done possible through networked, multi-collaborative ecosystems involving representative maritime clusters or intermediaries. Open innovation today is a well-known concept in large companies, which have developed specific mechanisms such as Big data/numerical challenges, hackathon-like initiatives.

A specific methodology for blue growth project emergence has been developed at the European level (NEPTUNE project and the innovation clubs based on STAR methodology) and could be adapted and applied at the Mediterranean level.

However, SMEs are less aware of the opportunities offered by open innovation. Innovation intermediaries or brokers, such as technology centres or competitive clusters, can help SME solution providers get closer to large industrial users to co-create new products/services through a better anticipation of their needs. In addition, there is a need to clarify intellectual and industrial property management issues potentially hampering open innovation.

Collecting marine, environmental and 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, developing policies and legislation to protect vulnerable areas of our coasts and oceans, understanding trends and 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. The strong link existing between data and observation infrastructures should be here underlined. Firstly marine and coastal observing systems are a key source of information and data that can be valued in many areas. Secondly, the storage, the cataloging and the availability of data require appropriate IT infrastructures.

Data provided with high and certified quality can be valued in several ways. To get the most out of data, it must be openly and freely accessible on same terms to researchers, public policy makers and the private sector which will be able to develop services based on these data. Sharing data is also a booster for innovation. Fundamental to growth and development is the concept of fair playing field allowing equal opportunities and equal competition to make new, innovative services for society from the open interoperable resources available.

The sharing of data and best practices allows technologies to progress more quickly and efficiently, while easily moving across boundaries of countries, market sector, culture, race, etc. This strategy is promoted at the European level (Inspire, European Open Science Cloud, EMODnet, Copernicus, Eurostat...). Taking measures for implementing these open approaches in the Mediterranean could be of great benefit for all the Mediterranean countries.

In an evolving knowledge-based society, access to key technologies, high quality data, modelling and satellite observations, are perceived to be key ingredients to support sustainable blue growth, especially in the coastal areas where many essential economic activities are occurring at the national scale. This goes hand in hand with the process of extracting essence from data, together with value addition by a wide range of downstream services that are fitting to the user needs, especially in the local scale application scenarios. In this context, the European Commission through DG GROW and its entrusted entities the European Environmental Agency (EEA) and Mercator Ocean International (MOI), running the Land and Marine Services respectively, are in the process of delivering under the MED7 initiative a white paper targeted to set the pace to develop Copernicus products for coastal areas. This entails products merging data from more than one Copernicus Core service, and a special framework linking Copernicus to Member State national coastal services such as in-situ coastal monitoring networks, and high-resolution models in the coastal and near shore domains.

These guidelines are fully in line with the Joint Communication on international ocean governance – EU's response to the UN 2030 Agenda for Sustainable Development - that proposes ways the EU can step up and play a stronger role at global and regional level by shaping the way oceans are used and managed.

Open data and blue economy

The development of the blue economy relies on increased exploitation of the capacity of marine and coastal ecosystems to provide services and resources to populations. However, all human activity related to the sea generates pressures (resource exploitation, waste, modification or occupation of the space, etc.). Many examples (e.g. collapse of certain fish stocks) show the difficulty of anticipating and taking pressure control measures to ensure the sustainability of sea related economic activities.

This difficulty in sustainably managing the resources and services offered by the sea faces several challenges:

- The lack of knowledge on the state of the marine environment and its evolution, but also the difficulty of characterizing the pressures exerted by human activities on the sea and the coast;
- The complexity of the functioning of the marine "socio-ecosystem" and the interactions at work, with the consequent lack of reliable predictive models and the difficulty of building scenarios;
- The difficulty in predicting the consequences of large-scale changes at work (global warming, biodiversity erosion, etc.) that will significantly impact Blue economy sectors (sea level rise, changes in marine habitats and communities, riverine inputs, atmospheric forcing...).
-

Given the dynamics of the almost enclosed Mediterranean Sea, many of the questions raised must be addressed at basin or sub-basin level (e.g. MPA connectivity, plastic pollution carried by currents). At these scales, making diagnoses and taking coherent and effective management measures requires a transnational approach. These objectives cannot be achieved without a solid base of indicators and knowledge built on reliable and comparable data.

The marine environment is also characterized by:

- The need for a multidisciplinary approach, essential to understanding ecosystem functioning;
- The high cost of acquiring marine data, particularly offshore.

These considerations justify the promotion of a policy of data and knowledge sharing, whether within a community or between actors sharing different objectives. It should be also pointed that qualified data sets can be of interest to multiples actors: scientific research, public authorities, the private sector and citizens.

An open approach on data and science is therefore expected to benefit to a large panel of stakeholders and to lead to progress in terms of:

- Qualification of data due to their increased use;
- Valuation of acquisition costs;
- Harmonization, comparability of data sets;
- Acceleration of assimilation, through science and support for public policies;
- Reduction of the costs of developing a new activity at sea.

Mapping and discussing implementation options and potentials of this priority			
Recent and ongoing relevant projects			
PROJECT	**DESCRIPTION**		**OBJETIVES**
SeaDataNet II Pan-European infrastructure for ocean and marine data management **SRIA Action:** A1.2 / A1.3	**Call:** FP7-INFRASTRUCTURES **Duration:** 01/10/2011 - 30/09/2015	**EU Contribution:** 6.000.000,00 € **Website:** https://www.seadatanet.org/	SeaDataNet is the leading network in Europe, actively operating and developing a pan-European infrastructure for managing, indexing and providing access to ocean and marine datasets and data products, acquired from research cruises and monitoring activities in European marine waters and the global oceans.
SeaDataCloud Further developing the pan-European infrastructure for marine and ocean data management **SRIA Action:** A1.2/ A1.3	**Call:** H2020-EU.1.4.1.2. **Duration:** 01/11/2016 - 31/10/2020	**EU Contribution:** 9.999.737,50 € **Website:** https://www.seadatanet.org/	SeaDataCloud aims at considerably advancing SeaDataNet services and increasing their usage, adopting cloud and HPC technology for better performance. More users will be engaged and for longer sessions by including advanced services in a Virtual Research Environment. Researchers will be empowered with a collection of services and tools, tailored to their specific needs, supporting marine research and enabling generation of added-value products.
ATTRACT breAkThrough innovaTion pRogrAmme for a pan-European Detection and Imaging eCosysTem **SRIA Action:** A1.1 **/** A1.2/ A1.3 / A1.4	**Call:** H2020-EU.1.4.2.1 **Duration:** 01/08/2018 - 30/11/2020	**EU Contribution:** 19.999.072,50 € **Website:** https://attract-eu.com/	The ATTRACT Phase-1 project proposes a new collaboration paradigm aligned with the 'Open Science, Open Innovation and Open to the World' philosophy. Its objective is the identification and initial development of breakthrough detection and imaging technology concepts for expanding fundamental research frontiers and suitable for future industrial upscaling for novel applications and business. It promotes the involvement of national and pan-European Research Infrastructures and their associated research communities, industrial organizations (especially SMEs) and innovation and business specialists.
ECOPOTENTIAL Improving future ecosystem benefits through Earth Observations **SRIA Action:** A1.2	**Call:** H2020-EU.3.5.5. **Duration:** 01/06/2015 - 31/10/2019	**EU Contribution:** 14.874.340,00 € **Website:** https://www.ecopotential-project.eu/	ECOPOTENTIAL project focus its activities on a targeted set of internationally recognised Protected Areas, blending Earth Observations from remote sensing and field measurements, data analysis and modelling of current and future ecosystem conditions and services. ECOPOTENTIAL considers cross-scale geosphere-biosphere interactions at regional to continental scales, addressing long-term and large-scale environmental and ecological challenges.
EUROFLEETS2 New operational steps towards an alliance of European research fleets **SRIA Action:** A1.2	**Call:** FP7-INFRASTRUCTURES **Duration:** 01/03/2013 - 31/06/2017	**EU Contribution:** 6.000.000,00 € **Website:** https://cordis.europa.eu/project/rcn/108205/reporting/en	The project aimed at further consolidating the alliance of marine research centres, universities and industrialists initiated in EUROFLEETS (1), with enlargement to the Polar research fleet community. It supported research services for progress of scientific knowledge on marine environment and the sustainable management of regional seas and oceans. In particular, it organized a common access to modern and well equipped research vessels to European and international scientists on sole condition of scientific excellence, thereby contributing to the EU ambitious goals for maintaining the ocean biodiversity or understanding climate change.

AQUACOSM Network of Leading European AQUAtic MesoCOSM Facilities Connecting Mountains to Oceans from the Arctic to the Mediterranean **SRIA Action:** A1.2	**Call:** H2020-EU.1.4.1.2 **Duration:** 01/01/2017 - 31/12/2020	**EU Contribution:** 9.999.804,75 € **Website:** https://www.aquacosm.eu/	The project aims to integrate scattered know-how between freshwater and marine RI and unit aquatic mesocosm science in an open network beyond the core consortium, with industry involved in an ambitious innovation process, to promote ground-breaking developments in mesocosm technology, instrumentation and data processing.
EGI-Engage Engaging the EGI Community towards an Open Science Commons **SRIA Action:** A1.2 / A1.4	**Call:** H2020-EU.1.4.1.3. **Duration:** 01/03/2015 - 31/09/2017	**EU Contribution:** 9.000.000,00 € **Website:** https://cordis.europa.eu/project/rcn/194937/factsheet/en	The mission of EGI-Engage is to accelerate the implementation of the Open Science Commons vision, where researchers from all disciplines have easy and open access to the innovative digital services, data, knowledge and expertise they need for their work. The Open Science Commons is grounded on three pillars: the e-Infrastructure Commons, an ecosystem of key services; the Open Data Commons, where any researcher can access, use and reuse data; and the Knowledge Commons, in which communities have shared ownership of knowledge and participate in the co-development of software and are technically supported to exploit state-of-the-art digital services.
JERICO-NEXT Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observatories **SRIA Action:** A1.2 / A1.4	**Call:** H2020-EU.1.4.1.2. **Duration:** 01/09/2015 - 31/09/2019	**EU Contribution:** 9.998.876,47 € **Website:** http://www.jerico-ri.eu/	The objective of JERICO-NEXT consists in strengthening and enlarging a solid and transparent European network in providing operational services for the timely, continuous and sustainable delivery of high quality environmental data and information products related to marine environment in European coastal seas. It includes an enable free and open access to data, enhance the readiness of new observing platform networks by increasing the performance of sensors, showcase of the adequacy of the so-developed observing technologies and strategies.
ODIP 2 Extending the Ocean Data Interoperability Platform **SRIA Action:** A1.4	**Call:** H2020-EU.1.4.3.2. **Duration:** 01/04/2015 - 31/03/2018	**EU Contribution:** 1.912.086,25 € **Website:** http://www.odip.org/	The project is promoting the development of a common global framework for marine data management by developing interoperability between existing regional e-infrastructures. Through a series of international workshops attracting relevant domain experts a number of prototype interoperability solutions will be developed which will be implemented by the regional data infrastructures to provide users with open access to good quality multidisciplinary data and associated services.
NeXOS Next generation, Cost-effective, Compact, Multifunctional Web Enabled Ocean Sensor Systems Empowering Marine, Maritime and Fisheries Management **SRIA Action:** A1.4	**Call:** FP7-ENVIRONMENT **Duration:** 01/10/2013 - 31/09/2017	**EU Contribution:** 5.906.479,00 € **Website:** http://www.nexosproject.eu/	The NeXOS project aims to improve the temporal and spatial coverage, resolution and quality of marine observations through the development of cost-efficient innovative and interoperable in-situ sensors deployable from multiple platforms, and Web Services for key domains and applications.

MARINE-EO Bridging Innovative Downstream Earth Observation and Copernicus enabled Services for Integrated maritime environment, surveillance and security **SRIA Action:** A1.1 / A1.4	**Call:** H2020-EU.2.1.6.3. **Duration:** 01/01/2017 - 30/11/2020	**EU Contribution:** 4.378.584,38 € **Website:** https://www.marine-eo.eu/	The project aims to Develop, test and validate two sets of demand-driven EO-based services, adopted on open standards, bringing incremental or radical innovations in the field of maritime awareness and leveraging on the existing Copernicus Services and other products from the Copernicus portfolio. Propose a set of "support" / "envelop" services which will better integrate the abovementioned EO and Copernicus-enabled services to the operational logic and code of conduct. Strengthen transnational collaboration in maritime awareness sector by facilitating knowledge transfer and optimization of resources for the public authorities participating in the buyers group.
ASSEMBLE Plus Association of European Marine Biological Laboratories Expanded **SRIA Action:** A1.1 / A1.2	**Call:** H2020-EU.1.4.1.2. **Duration:** 01/10/2017 - 30/09/2021	**EU Contribution:** 9.999.911,47 € **Website:** https://cordis.europa.eu/project/rcn/211566/factsheet/en	ASSEMBLE Plus will provide scientists from academia, industry and policy with a quality-assured programme of Transnational Access (TA) and Virtual Access (VA) to marine biological stations offering a wide variety of marine ecosystems, unique marine biological resources, state-of-the-art experimental and analytical facilities with integrated workflows, historical observation data, and advanced training opportunities. The goal is to stimulate European excellence in fundamental and applied research in marine biology and ecology, thereby improving our knowledge- and technology-base for the blue economy, policy and education.
COLUMBUS Monitoring, Managing and Transferring Marine and Maritime Knowledge for Sustainable Blue Growth **SRIA Action:** A1.1 / A1.2 / A1.3	**Call:** H2020-EU.3.2 **Duration:** 01/03/2015 - 28/02/2018	**EU Contribution:** 3.997.488,00 € **Website:** http://www.columbusproject.eu/	The COLUMBUS project intends to capitalise on the EC's significant research by ensuring accessibility and uptake of research Knowledge Outputs by end-users (policy, industry, science and wider society). COLUMBUS will ensure measurable value creation from research investments contributing to sustainable Blue Growth within the timeframe of the project. It will then set about identifying and collecting "Knowledge Outputs" from past and current EC projects. Rigorous analysis will take place to identify specific applications and end-users. Transfer will be achieved and measured through tailor-made knowledge transfer. All knowledge collected will be made accessible the pre-existing Marine Knowledge Gate.
COMMON SENSE Cost-effective sensors, interoperable with international existing ocean observing systems, to meet EU policies requirements **SRIA Action:** A1.1 / A1.4	**Call:** FP7-ENVIRONMENT **Duration:** 01/11/2013 - 28/02/2017	**EU Contribution:** 4.664.072,00 € **Website:** https://cordis.europa.eu/project/rcn/110790/factsheet/en	The COMMON SENSE project will contribute to support the implementation of the Marine Strategy Framework Directive (MSFD) and other EU policies (e.g. Common Fisheries Policy), providing easily usable across several platforms, cost-effective, multi-functional innovative sensors to detect reliable in-situ measurements on key parameters by means of methodological standards. This proposal will focus, by means of a multidisciplinary and well-balanced consortium on eutrophication, contaminants, marine litter and underwater noise descriptors of the MSFD.

EOSC-Life Providing an open collaborative space for digital biology in Europe **SRIA Action:** A1.1 / A1.4	**Call:** H2020-EU.1.4.1.1 **Duration:** 01/03/2019 - 28/02/2023	**EU Contribution:** 23.745.996,25 € **Website:** https://cordis.europa.eu/project/rcn/219199/factsheet/en	EOSC-Life brings together the 13 Biological and Medical ESFRI research infrastructures (BMS RIs) to create an open collaborative space for digital biology. It is our joint response to the challenge of analysing and reusing the prodigious amounts of data produced by life-science. Managing and integrating this data is beyond the capabilities of most individual end-users and institutes. By publishing data and tools in a Europe-wide cloud EOSC-Life aims to bring the capabilities of big science projects to the wider research community.
FIXO3 Fixed Point Open Ocean Observatories Network **SRIA Action:** A1.2	**Call:** FP7-INFRASTRUCTURES **Duration:** 01/09/2013 - 31/08/2017	**EU Contribution:** 7.000.000,00 € **Website:** http://www.fixo3.eu/	The Fixed point Open Ocean Observatory network (FixO3) seeks to integrate European open ocean fixed point observatories and to improve access to these key installations for the broader community. These will provide multidisciplinary observations in all parts of the oceans from the air-sea interface to the deep seafloor.
EUROARGO Euro-Argo RI European contribution to the Argo programme		**Website:** https://www.euro-argo.eu/	European contribution to the international Argo programme. Its aims are: to provide, deploy and operate an array of around 800 floats contributing to the global array (a European contribution of ¼ of the global array); to provide enhanced coverage in the European regional seas; to implement the new phase of Argo, with extensions towards biogeochemistry, greater depths and high latitudes; and to provide quality controlled data and access to the data sets and data products to the research (climate and oceanography) and operational oceanography (e.g. Copernicus Marine Environment Monitoring Service - CMEMS) communities.
EuroGEOSS Programme		**Website:** http://www.eurogeoss-fp7-project.eu/default.aspx	Strengthening the benefits for Europe of the Global Earth Observation System of Systems (GEOSS), should also facilitate the access to and integration of untapped national in-situ Earth observation data with research-based data and different sources such as Copernicus, the European research infrastructures, citizen science initiatives and others, into user oriented applications. EuroGEOSS should focus on delivering information for the achievement of the 2030 Agenda for Sustainable Development and other GEO engagement priorities in a European context.
ODYSSEA Operating a network of integrated observatory systems in the Mediterranean sea	**Call:** H2020-EU.3.2.5. **Duration:** 01/06/2017 - 30/11/2021	**EU Contribution:** 8.398.716€ **Website:** http://odysseaplatform.eu/	ODYSSEA will develop, operate and demonstrate an interoperable and cost-effective platform that fully integrates networks of observing and forecasting systems across the Mediterranean basin, addressing both the open sea and the coastal zone. The platform will collect its data from the many databases maintained by agencies, public authorities, and institutions of Mediterranean EU and non-EU countries, integrating existing earth observation facilities and networks in the Mediterranean Sea building on key initiatives such as Copernicus, GEOSS, GOOS, EMODNet, ESFRI, Lifewatch, Med-OBIS, GBIF, AquaMaps, Marine IBA e-atlas, MAPAMED and others with marine and maritime links.

ShareMED Sharing and enhancing capabilities to address environmental threats in Mediterranean sea	**Call:** Interreg MED strategic project	**Website:** https://governance.interreg-med.eu/	The project will capitalise on knowledge provided by previous projects and existing EU infrastructures, and will contribute to the definition of long term strategies and action plans for assessing and addressing environmental threats in the Mediterranean. SHAREMED will: • engage stakeholders and authorities, and jointly define state-of-the-art and regional strategies; • collate and harmonise existing info, data and knowledge and contribute to joint production of a database of coherent data; • define common procedures and jointly produce atlas of state and hazard maps; • integrate existing observing infrastructures in a common transnational system of systems and jointly disseminate • observations through common portals; • enhance forecast capabilities through development and implementation of coastal high resolution transnational systems; • explore potential of new observing methodologies; • - define roadmaps, guidelines, action plans.

Programmes and initiatives of relevance, including research and data infrastructures

EUROPEAN PROGRAMMES AND INITIATIVES

Different programs, strategies, policy frameworks are related to this priority and already exist in the Mediterranean at the regional, national, European or international scale.

Open data

The need to share and facilitate access to data on the ocean and coastal environment has led to establishing collaborative international programmes from the scientific community (e.g. ARGO in physical oceanography, born in the 1990s, or OBIS in marine biology).

At the institutional level, the Barcelona Convention implemented under the umbrella of UNEP plays an important role in reporting on the state of the environment and pressures in the Mediterranean. UNEP/MAP is currently setting up an information system implemented by INFO/RAC to host data on the state of the marine environment. However, today few UNEP/MAP data can be accessed online. The work carried out within the frame of this Regional Sea Convention mainly takes the form of reports based on expertise or data that are not public.

At European level, significant efforts have been made for years to improve sharing of environmental and marine data. The most prominent programs are:

- Copernicus (https://www.copernicus.eu/en) the European Union's Earth Observation Programme, that offers information services based on satellite Earth Observation and in situ data. CMEMS is the marine services component of Copernicus http://marine.copernicus.eu

- SeaDataNet, a distributed Marine Data Infrastructure for the management of large and diverse sets of data deriving in situ ocean observation https://www.seadatanet.org/

- WISE-marine (Water Information System for Europe), which is a portal and an infrastructure for sharing information about the marine environment at European level https://water.europa.eu/marine

- EMODnet (European Marine Observation and Data Network) that gathers data from various sources about the state of the seas and the maritime activities http://www.emodnet.eu/

Even if these programs have been initiated with different purposes (development of marine research infrastructures, environmental policy implementation, support to integrated marine policies), they are interlinked and being developed in a coordinated manner (e.g. EMODnet Physics and EMODnet Chemistry are based on the SeaDataNet infrastructure).

In terms of socio-economic data:

- Eurostat (the statistical office of the European Union). Linked with Eurostat, the project Medstat, supported by the European ENPI funds, aims at regional statistical cooperation in South Mediterranean countries https://ec.europa.eu/eurostat/web/european-neighbourhood-policy/enp-south/medstat-iv
- Fishery and aquaculture data are available through the FAO (GFCM data base http://www.fao.org/gfcm/data/en/. For the Mediterranean, FAO, Ocean Science for Sustainable Development, includes the promotion of a free and open data sharing and multi-stakeholder contributions by governments (rich and poor), the private sector and citizens: http://www.fao.org/3/CA0463EN/ca0463en.pdf
- Data (e.g. tourism, maritime transport) are also accessible through international sectoral organisations (e.g. World Tourism Organization) https://www2.unwto.org/content/data

Although most of the programmes previously mentioned are open to Mediterranean southern and eastern countries, significant gaps remain in the Mediterranean:

- Huge imbalance between EU and non-EU countries (e.g.: EMODnet integrates some data sets from Southern countries, but the maps built from the data bases show mainly data on the northern part of the sea;
- Lack of homogeneity of data sets between countries (even at European level), leading to difficulties for aggregating and comparing data;
- Granularity is often not fine enough. This is particularly true for socio-economic data which are mostly available at country level. This is especially an issue for countries with several maritime borders such as France (Atlantic, Channel and Western Mediterranean, Italy (Adriatic and Western Mediterranean) or Turkey (Aegean, Eastern Mediterranean, Marmara and Black Sea).

Open science

In the area of Open Science, several European and international initiatives do not specifically target marine sciences, but they promote free sharing and access to data and knowledge. Open Science has been gradually recognized over the past years as a key driver for accelerating innovation and answering the main societal challenges. Among the most prominent initiatives, we can give the examples of:

- The European Open Science Cloud (EOSC), which has been initiated by the European Commission in 2016 and whose aim is to create a virtual trusted environment with open and seamless services for storage, management, analysis and re-use of research data and knowledge. The EOSC Declaration has been endorsed by more than 70 institutions https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud
- Plan S is an initiative for Open Access publishing launched in September 2018, supported by the European Commission and the European Research Council. The plan requires that, from 2021, scientific publications that result from research funded by public grants must be published in compliant Open Access journals or platforms. https://www.coalition-s.org/
- Knowledge Exchange (KE) is a European partnership made of six organizations aiming at developing infrastructures and services to enable the use of digital technologies to improve higher education, research and to enable open scholarship; http://www.knowledge-exchange.info/
- The Directory of Open Access Journal (DOAJ), which hosts a community-curated list of open access journals and meeting high quality standards; https://doaj.org/
- The Confederation of Open Access Repositories (COAR) is an international association with over 140 members and partners from around the world representing libraries, universities, research institutions, government funders and others. https://www.coar-repositories.org/

The culture of open science gradually increased over the past years. However, work remains to be done to promote the principles of Open Science, to encourage scientists to publish their papers in open access and to include non-EU countries in those existing networks.

Open innovation

Two projects are to be mentioned:

- H2020-INNOSUP-2018-2020 For a better innovation support to SMEs | The future project involves the setting-up of a European Open Innovation Network in advanced technologies with a central brokerage service point, aimed at matching innovation needs/requests from large industries with innovative solutions from SME technology providers. Innovation intermediaries such as technology centres can help SME solution providers get closer to large industrial users to co-create new products/services through a better anticipation of their needs. One major role of technology centres is "to bridge the gap between internal and external know-how". They are therefore well-positioned as innovation intermediaries in an open innovation context.

- NEPTUNE (New cross sectoral value chains creation across EuroPe facilitaTed by clUsters for SMEs' iNnovation in bluE growth). In the frame of the NEPTUNE project, ESTIA is in charge of delivering a specific methodology of project emergence in interclustering and intersectoral context to animate innovation clubs. The innovation clubs can be defined as sustainable sub-workgroups addressing innovative topics. This specific proposed methodology is named STAR methodology. Following a creativity approach, in the case of NEPTUNE, the STAR methodology stimulates the emergence of Blue Growth projects and the identification of the best ones. The potential participants to NEPTUNE innovation clubs, in particular SMEs, are located all around Europe. Specifically, the SMEs are spread out in the seven countries the NEPTUNE consortium is located. In order to optimize travels, staff costs, and efficiency of the work sessions, innovation clubs will rely on the interconnection of nine physical meeting rooms (one in each NEPTUNE region) combined with the use of a dedicated software (called hereafter the STAR platform). Hence, the proposed approach allows the participants (SMEs mainly) to be distributed into different virtual thematic sub-workgroups. Furthermore, participants will be able to join the innovation clubs sessions through their own laptop from a remote place.

In order to foster innovation the European Union has created the European Institute of Innovation and Technology (EIT). EIT has in particular supported the development of "Innovation communities" bringing together businesses (industry and SMEs), research centres and universities as partners. Some of these communities are relevant to BLUEMED (e.g. Climate, Food, and Digital).

Academia and capacity building

In 2019, the EC launched the first pilot of the European Universities Initiative by funding 17 alliances to network universities in Europe for a deep level of integration involving joint curriculum design with seamless student mobility opportunities, development of complementary research facilities, and facilitating diverse degree pathways basing on the specialties of the different high class institutions composing the alliances. One of these networks led by the University of Cádiz, Spain, and comprising the University of Kiel, Germany; Western Brittany, France; Split, Croatia; and Gdansk, Poland; along with the University of Malta, are building the European University of the Sea (SEA EU). The target is to synergise resources and combine infrastructures from the partner universities to offer a broader and complete approach in marine and maritime studies, targeting to empower the future professionals with skills and excellence to meet the future challenges of the evolving marine sector.

Specialised post-graduate research and taught courses like the MSc in Applied Oceanography offered by the University of Malta (https://www.um.edu.mt/ science/geosciences/physicaloceanography/msc), and dedicated short thematic training courses are setting the scene for applicative, hands-on learning programmes spanning and merging the scientific, technical and applicative aspects of marine and maritime studies to offer students a wide-ranging integrated approach, linking science to management, putting technology at the service of users and stakeholders, and providing tools and training for more efficient service oriented applications. Such formative experiences should be also offered to the non-EU countries. These initiatives should be synergised under a common framework under for example the Med School for Applied Oceanography.

The following programmes and initiatives need also to be mentioned as they promote the openness and the coordination in the area of marine data, knowledge and innovation.

International scale:

- **International Oceanographic Data and Information exchange** since 1961 – aims at facilitating the discovery, access and exchange of oceanographic data, information and products between participating MS, and by meeting the needs of users for data and information products. It also assists MS to acquire the necessary capacity to manage marine research and observation data and information + encourages the long term archival, preservation, documentation, management and services of all marine data, products and information;

- **Global Ocean Ship-Based Hydrographic Investigation Program** – Joint WMO-IOC Technical commission for oceanography and marine meteorology – brings together scientists with common interests in physical oceanography, carbon cycle, marine biogeochemistry and ecosystems and other users and collectors of hydrographic data to develop a globally coordinated network of sustained hydrographic sections as part of the global ocean/climate observing system. JCOMM coordinates, develops and recommends standards of procedures for a fully integrated marine observing, data management and service system.

European and Mediterranean scales:

- **European Regional Development Fund** – aims at strengthening economic and social cohesion of the EU by correcting imbalances between regions. One of its key priorities is the digital agenda;

- **Copernicus Marine Environment Monitoring Service 2015-2025** – information from satellites and in situ observation used for daily analyses and forecasts of the state of ocean and sea. Its Service Evolution Strategy aims at delivering high quality products and downstream services + making CMEMS data and products widely accessible;

- **JPI Oceans** – aims at aligning efforts and funding in marine research between MS and associated countries through joint calls. Will to act as a Science-Policy Interface and to link Oceans, Human Health and Wellbeing (Open Science);

- **EU Integrated Maritime Policy** – seeks to coordinates existing policies on specific maritime sectors and one of its priorities is related to marine data and knowledge;

- **EU Blue Growth Strategy** – supports sustainable growth in the marine and maritime sectors as a whole. One of its three main components concerns the necessity to provide knowledge, legal certainty and security in the blue economy and highlights the importance to strengthen marine knowledge to improve access to information about the sea;

- **EU Digital Single Market Strategy** adopted in 2015 – aims at improving access to digital services and goods for consumers and businesses; developing an environment where digital networks and services can prosper; maximizing the growth potential of the EU digital economy. A specific objective aims at helping large and small companies, researchers, citizen and public authorities to make the most of new technologies;

- **Mediterranean Sea Policy** – aims at promoting a virtual knowledge center for marine and maritime affairs in the Mediterranean;

- **Virtual Knowledge Center** – managed by the UfM and launched in 2014 to provide a centralized platform for marine and maritime information and to improve synergies across different initiatives and projects in the Mediterranean;

- **United Nations Environment Program/Mediterranean Action Plan** – coordinating unit for the Mediterranean Action Plan Secretariat to the Barcelona Convention and its Protocols. It coordinates the efforts for information sharing and communication and is managing a spatial data infrastructures and data portal for the whole Mediterranean area;

- **INSPIRE 2007/2/EC Directive** – European countries are committed to open policies and common rules exist in the EU.

- **MSP Directive 2014/89/EU**

- **UfM Ministerial Declaration on Blue Economy** (2015; a new one upcoming in 2021)
https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

- **UfM Ministerial Declaration on Environment and Climate Change** (2014; a new one upcoming in 2020)
https://ufmsecretariat.org//wp-content/uploads/2014/05/20140515_UfM_declaration_FINAL_compromiseeditorial-changes.pdf

- **UfM Working Group on Blue Economy**
https://ufmsecretariat.org/ufm-working-group-blue-economy/

- Any other relevant UfM Ministerial (transport, energy, sustainable urban development, etc.), related strategies, programmes and projects

  https://ufmsecretariat.org/what-we-do/water-environment/

Target sectors and groups

The access to data and knowledge as a public good and free of charge, is the basis for use and re-use of data to generate a multiplier effect and for value addition by a wide range of users, leading to the generation of knowledge and supporting service provision and economic activity.

Throughout history the sea has played a crucial role in the socio-economic development of the Mediterranean region. Today the quest for environmental security, based on the concepts of sound ocean governance, sharing of knowledge and the controlled use of resources, is the precursor for prosperity, sustainability and peace. The importance of marine resources to our wellbeing calls for the sustainable use of the sea in both open and coastal domains. There is an ever increasing responsibility on the scientific community to provide accurate and routinely updated information for a more comprehensive knowledge on the state of the sea and the marine ecosystem, to support the chain of policy, planning and decision–making undertakings, to understand and address climatic change impacts, to provide frameworks for more effective surveillance and monitoring, and furthermore to generate added value to data and support smart and innovative applications in marine-related economic activities.

Beyond the scientific community, it is important to target public authorities and bodies (agencies…), at different levels (national, regional…) whose missions include data collection and production of knowledge.

All the sectors of the Blue Economy are concerned by sharing data and knowledge about the status of the marine ecosystem, the understanding and the monitoring of the response of the ecosystem to the pressures exerted by human activities. As such, private companies operating in the field of blue economy must be involved in the process of improving data and knowledge sharing.

It is also necessary to consider the many NGOs working at different scales on environmental or economic issues related to the sea.

There is moreover a recognition of the opportunities and advantages which transpire from regional cooperation on marine research and environmental monitoring especially in a region like the Mediterranean where the multitude of jurisdictions and multiple uses of marine space calls for more stringent regulations, a holistic approach across disciplines, and collaborative management across stakeholders and across countries.

Funding options and agencies

Most of the actions described in the following table rely on efforts produced at national, regional or local scales. For instance, data on the status of the marine environment are collected by countries. The EC needs to commit MSs to run in the long term the national scale services by dedicated secured funding and a targeted plan of action by 2030. The main challenge is to set up a framework able to foster harmonization of data and sharing of knowledge at trans-national level, not only among European countries.

- **CMEMS** – Copernicus Marine Environment Monitoring Service;
- **Horizon 2020** – especially under Pillar 1 'Excellent Science' with Research Infrastructures' thematic and under Pillar 3 'Societal Challenges' with the 'food security, sustainable agriculture, marine and maritime research and the bio-economy' thematic;
- **Horizon Europe** – in particular under Pillar 1 'Research Infrastructures' ; Pillar 2 'Global challenges and Industrial Competitiveness' – Cluster 'Food and natural resources', and within the Mission 'Healthy Oceans, Seas, Coastal and Inland Waters';
- **Union for the Mediterranean**;
- **UNEP/MAP**;
- **JPI Oceans**;

- Private foundations;
- Competent ministries and regional/local authorities through specific calls;
- Maritime cluster:
  - European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
  - Pole Mer Mediterranee (https://www.polemermediterranee.com/).

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	1) Creation of a **Mediterranean European Open Innovation Network** in advanced technologies; 2) Use of **big data** (GAFA, mobile phone companies, AIS data) for extracting socio-economic information, social networks harvesting	**How:**	
		When:	
Alignment and coordination	1) Alignment and coordination with EMODnet, Copernicus and national marine core data services. Creation of **MedBlueNet** – integrated data service providing open access to data layers at different scales (regional and coastal) for both scientific /technical (research, environmental management, surveillance, security, industry) and non-technical (legal, socio-economic, policy) aspects; 2) Alignment and coordination with Eurostat and Medstat to create a **Blue Economy Mediterranean Observatory**; 3) Alignment, coordination and further connections with other prominent initiatives such as EOSC and ESFRI.	**How:**	Meetings and activities for the identification of priority topics/ actions and of options for joint implementation. Research to strengthen dialogue and institution capacities. Promote and harmonize legislation to enforce public and private actors (when operating under public contract) to provide open access to collected data.
		When:	2020-2023.
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	1) Diverse initiatives in the field of **marine citizen science** (on biodiversity, litters). 2) Encourage Trans Mediterranean **political engagement for the labelling and sharing of data**, through the development of joint DOI operations for example.	**How:**	Supported by BLUEMED cafes-like events on the occasion of conferences, workshops and meetings.
		When:	2021-2023.
Start-Up actions		**How:**	
		When:	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects		**How:**	
		When:	

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Lobbying actions	Actions to highlight the importance of open data, open science and open innovation within the Horizon Europe Mission of Healthy Oceans, Seas, Coastal and Inland Waters, and to **promote dedicated calls**;	**How:**	1) Dedicated meetings and participation to relevant working groups; 2) Relevant actions and discussions to lead with competent national, European and Mediterranean authorities. Creation of joint DOI operations.
		When:	1) 2020-2023. 2) 2020-2023.
Training and capacity building initiatives	Mediterranean School of Applied Oceanography.	**How:**	
		When:	
Implementation Working Groups (IWG) on specific sectors		**How:**	
		When:	
Communication and engagement	1) **Annual Mediterranean Blue Conference** ; 2) **Blue Mediterranean open Access Journa**l (open to marine science, environment, socio-economy).	**How:**	1) Organization of a conference. 2) Publication of an Open Access Journal. 3) Mobilize appropriate communication skills.
		When:	1) One conference per year, starting in 2021. 2) Bi-annual publication, starting in 2021.

FICHE 11

BUILDING CAPACITY, BLUE SKILLS AND BLUE PROFESSIONALS

CO-CHAMPION COUNTRIES GREECE & EGYPT

Background

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 economic, knowledge and technology priorities, not least in terms of research and innovation.

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.

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. Transboundary cooperation is a prerequisite for developing blue R&I capacity in the Mediterranean region and supporting it with the right skills sets.

The 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.

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 national and international level such as by UNIMED, EMUNI, the research infrastructures EMBRC and ASSEMBLE and the IOC-UNESCO Ocean Teacher Global Academy.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
BlueGeneration project	**Call**: Iceland, Liechtenstein and Norway through the EEA and Norway Grants Fund for Youth Employment	**Website:** https://bluegeneration.org/index.php/en/blue-generation-programme	The objective of the Blue Generation Project is to inspire and engage young people between 15 and 29 years to pursue a sustainable career in one of the following Blue Economy sectors: coastal tourism, aquaculture, ocean energy, marine biotechnology, shipbuilding, maritime transport and fisheries. At the heart of the project lies the Blue Generation Program (BGP). The BGP is an integrated outreach action organised and implemented by the project with the aim to "attract, engage and convert" young people to the vast opportunities of the Blue Economy job market.
			The Blue Generation Program offers well-documented information about blue career prospects in Greece, Spain, Portugal, Bulgaria and Poland, mentoring programs for those among the young who wish to actively pursue a career in Blue Economy, including skills validation tools to better cope with the needed qualifications, as well as mobility exchanges through study visits for gaining first-hand experience in various Blue economy sectors.

			To succeed in this, the Blue Generation Project brings together experts from the Blue Economy and Youth organisations to share knowledge about skills needs, career paths, open job positions and existing training.
ResponSEAble project	**Call:** European Commission's Horizon 2020 program **Duration:** 01/01/2017 - 31/12/2018	**EU Contribution**: 3.696.644 € **Website:** https://www.responseable.eu/	For the last three years, the ResponSEAble project has been looking at ways to help people understand their connection to the sea. Whether they live on the coast or inland, the project's goal has been to figure out how to encourage Europeans to take a more interest in their oceans, improve their understanding and to treat them with greater respect. ResponSEAble is funded by the European Commission's Horizon 2020 program and has 15 partners from around the European Union. This diverse group has been trying to figure out how to connect people to their seas and to help them better understand the complex human-ocean relationship. The reason is simple: if people have better knowledge they will make responsible decisions – in other words, they will become "ocean literate".
BlueSmart Project Blue Education for Sustainable Management of Aquatic Resources	**Call:** European Maritime and Fisheries Fund **Duration:** August 2012-July 2016	**EU Contribution**: 399.493€ **Website:** https://bluesmart.hr/en/blue_smart_project/about_the_project/	BlueSmart Project aims to create new skills and competences in blue economy sector and increase the employability of current and future sectors' workers in the County of Zadar.
SEA CHANGE Our ocean/Our health	**Call:** H2020-BG-2014-1 **Duration:** 01/03/2015 – 28/02/2018	**EU Contribution:** 3.494.876 € **Website:** https://www.seachangeproject.eu/	• Compile an in-depth review of the links between Seas and Ocean and Human health based on latest research knowledge outputs. • Help to design and implement successful mobilisation activities focused on education, community, governance actors and directly targeted at citizens. • Ensure Knowledge exchange with transatlantic partners to bring about a global approach to protecting the planet's shared seas and ocean.
Ariel	**Call:** ADRION - FIRST CALL FOR PROPOSALS **Duration:** 01/01/2018 – 31/12/2019	**EU Contribution**: 904,453.12€ **Website:** https://ariel.adrioninterreg.eu/	Promoting small scale fisheries and aquaculture transnational networking in Adriatic-Ionian macroregion Support the development of a regional Innovation system for the Adriatic-Ionian area ARIEL partners will then develop a Joint Research Agenda for small-scale fishery and aquaculture and a Chart of Innovation Services, a strategic and multidisciplinary action plan defining common priorities and research lines, areas of improvement, knowledge based solutions and actions to successfully address the major challenges linked to innovation and sustainability of fisheries and aquaculture for the coming years in the Adriatic and Ionian Sea region.
FUTURE 4.0 ManuFactUring educaTion and training governance model for IndUstry 4.0 in the Adriatic-Ionian aREa	**Call:** ADRION - FIRST CALL FOR PROPOSALS **Duration:** 01/01/2018 – 31/12/2019	**EU Contribution**: 716,399.08€ **Website:** https://future4.adrioninterreg.eu/	With specific focus on Blue Economy, the shipyard & nautical logistic supply chain, the project intends to design a shared strategy to innovate companies approach to training through a Smart Learning Model enhancing shipyard competitiveness in Italy (Veneto & Apulia), Croatia, Greece and Albania. The project structure foresees the definition of a Technological Map of the Shipyard & Nautical Logistic supply chain thorough inclusive road mapping and foresight activity on technology and related competences. Results will be the lay for the designing of a knowledge, competence and skills training/learning hub (FUTURE4.0 platform) involving Universities and training orgs., companies and PAs.

FISH-MPA PHASE 2	**Call** H2020 **Duration:** 01/11/2016 – 31/10/2019	**EU Contribution**: 2.975.000,00€ **Website:** https://www.iucn.org/regions/mediterranean/projects/current-projects/fishing-governance-mpas-potentialities-blue-economy-2-fishmpablue-2 / https://fishmpablue-2.interreg-med.eu/	The project aims at providing results and specific guidance for the management of artisanal fisheries in MPAs through testing the process of a governance toolkit, bringing capacity building for stakeholders (MPAs managers and local fishermen groups) and supporting policy recommendations in order to set up fishery management models.
BOOSTing The innovation potential of the triple helix of Adriatic-Ionian traditional and emerging BLUE growth sectors clusters through an open source/ knowledge sharing and community based approach	**Call** ADRION - FIRST CALL FOR PROPOSALS **Duration**: 01/01/2016 – 31/10/2019	**EU Contribution**: 1.138.099.85€ **Website:** https://blueboost.adrioninterreg.eu/	The program aims at unlocking and boosting the potential of knowledge/technology transfer, transnational and cross-sectoral cooperation of key innovation actors of traditional (primarily fisheries and ship-building) and emerging (primarily Blue technologies-including aquaculture- green shipbuilding, robotics and new materials) Blue Growth sectors by reinforcing the relationships and interactions within and among their clusters according to an open source, knowledge sharing &community based approach.
CLIPPER Creating a leadership for maritime industries - New opportunities in Europe	**Call:** Regional ERDF / ESF Operational Programme 2014-2020 **Duration:** 01/01/2017 – 30/06/2021	**EU Contribution**: 1.086.023.00€ **Website:** https://www.interregeurope.eu/CLIPPER/	CLIPPER is an innovative interregional cooperation project that brings together seven pro-active regions to address the negative impact the global economic recession has had on Europe's maritime sector. This sector is also suffering from growing competition from emerging countries. In particular, the project is supporting the SMEs to develop innovative business strategies focused on diversification and differentiation that help them to create jobs and growth in the Blue Growth sector.
ENTREFISH Entrepreneurship for new employment and new skills in fishery's and aquaculture's SMEs is a project funded under the "Blue Careers" Call, launched by EASME, the Executive Agency for Small and Medium-sized Enterprises of the EU Commission, to promote employment and the development of the "Blue Economy"	**Call** Blue Careers Call, launched by EASME - EASME/EMFF/2016/1.2.1.2 - Blue Careers in Europe **Duration:** 01/03/2017 - 28/02/2019	**EU Contribution**: 580.000,00€ **Website:** http://www.entrefish.eu	It supports the skills of entrepreneurs, workers, university students and young graduates to foster the sustainable growth of aquaculture and fishery enterprises, through an approach based on Multidisciplinarity, inter-sectoral approach, and an intergenerational pact.

BRIdges The GAp for Innovations in Disaster resilience	**Call:** H2020 European Commission Project **Duration:** 2016-2020	**EU Contribution:** 5.999.520,50 € **Website:** www.brigaid.eu	BRIGAID is a 4-year project (2016-2020) under EU Horizon2020, aimed to effectively bridge the gap between innovators and end-users in resilience to floods, droughts and extreme weather.
DEEP BLUE Developing Education and Employment Partnerships for a Sustainable Blue Growth in the Western Mediterranean Region	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** July 2009-June 2013	**EU Contribution**: 475.678,00€ **Website:** http://mamba.habgor.ac.uk/media.php	DEEP BLUE will promote collaboration between marine and maritime education, research, and training centres to strengthen relevant skills and increase capacity building for blue career development. The DEEP BLUE project aims at developing skills and building capacities throughout enhancing geopolitical dialogue and international scientific cooperation (Science Diplomacy) in the Western Mediterranean Region.
BLUECloud	**Call:** H2020 European Commission Project **Duration:** 01/09/2019 – 01/09/2022	**EU Contribution**: 5.999.520,50 € **Website:** https://www.csc.fi/-/bluecloud / https://www.blue-cloud.org/	The project implements a practical approach to address the potential of cloud based open science to achieve a set of services identifying also longer term challenges to build and demonstrate the Pilot Blue Cloud as a thematic EOSC cloud to support research to better understand & manage the many aspects of ocean sustainability, through a set of five pilot Blue-Cloud demonstrators.
MISTRAL Mediterranean Innovation Strategy for transnational activity of clusters and networks of the Blue Growth	**Call**: Interreg-MED 2014-2020 **Duration:** 48 months	**EU Contribution:** €4.100.000 **Website:** https://mistral.interreg-med.eu/	to promote and make effective a transnational BG ecosystem of innovation where SMEs and corporates, RTOs, higher education institutions, public sector, cooperate to: • Develop sustainable innovation actions, • Increase their innovation performance, • Sustain the development of the entrepreneurial spirit, • Increase the access and sharing of the marine knowledge.

Programmes and initiatives of relevance, including research and data infrastructures

- **MENTOR PROGRAM BLUE GROWTH** http://www.bluecareers.org/

  The proposed Career Centre for the Eastern Mediterranean Sea (EM) and Black Sea (BS), aims to attract young people and experienced workers and fill existing skills' gaps by supporting activities that will increase employability in key Blue sectors of the region: Maritime Transport (shipping, ports, ship-repairs and shipbuilding), cruise and nautical tourism, aquaculture and offshore oil and gas.

- ***Εναλεια* fishing school** https://enaleia.com/en/home/

  Enaleia is a social enterprise that aims to make each fisherman fish in a more efficient and eco-friendly way. It is an award-winning youth initiative, aiming to attract more people into the fishing sector, educating them and the same time, creating conditions for sustainable fishing. Our students receive all the necessary knowledge and skills by attending a full specialized and tailor-made training program. The program combines distance learning, lectures, workshops and on-the-field training by professional fishermen.

- **4helix+** https://4helix-plus.interreg-med.eu/news-events/news/ 4helix+ Knowledge Providers: Gallery of MED transnational innovation experts 4helix+ has set up a transnational database of Knowledge Providers, i.e. Cultural and Creative Industries and 'new innovation agents' in view of promoting their innovation skills and expertise within a MED transnational context. A broad gallery of registered Knowledge Providers is already available for consultation, while interested experts are still in time to join (by 31 July 2020).

- **Blue Growth Master http://bluegrowth.inogs.it/advancedmaster/introduction** The Master in Sustainable Blue Growth is established to bring scientific excellence and technological innovation at the centre of a number of Blue Growth initiatives.

  The Master is jointly organized by University of Trieste and OGS to support the creation of stable and attractive blue career pathways throughout strengthening professional skills and enhancing competencies in fields related to sustainable blue growth. It will start in January 2020.

- **Bluegrowth.gr** Blue Growth is aiming to inspire and help young entrepreneurs realize the innovative concepts relating to marine and freshwater resources. Creative disruption in the maritime sector can introduce promising business opportunities, create new jobs, and transform traditional processes into more productive and sustainable activities.

- **BlueBRIDGE – Building Research environments fostering Innovation, Decision making, Governance and Education to support Blue growth** https://www.bluebridge-vres.eu/about-bluebridge It supports capacity building in interdisciplinary research communities actively involved in increasing scientific knowledge about resource overexploitation, degraded environment and ecosystem with the aim of providing a more solid ground for informed advice to competent authorities and to enlarge the spectrum of growth opportunities as addressed by the Blue Growth Societal Challenge.

- **SEA-EU European University of the SEA** part of the Erasmus + program (An alliance of 6 universities (3 of which are in Mediterranean regions) with strong marine and maritime expertise.
- Common Fisheries Policy.
- Mediterranean Universities Union.
- Blue Med Initiative.
- Blue Growth Initiative of FAO.
- MSSD 2016-2025 and Regional Action Plan on SCP.
- ICCAT - GBYP project on Bluefin Tuna.
- CPMR Inter-Mediterranean Commission.
- IMO World Maritime University.

Target sectors and groups

- Farmers.
- Fishermen/aquaculture.
- Tourist operators.
- Local population.
- Disaster risk managers.
- Marine Transport sector.
- Health.
- Blue economy (energy, biothech, shipping).
- Territorial planning.
- Water resources managers.
- Scientists.
- Students.
- Small to Medium Enterprises.

Funding options and agencies

- ENI-CBC.
- Interreg.
- The Interreg IPA CBC Programme.
- Horizon 2020.
- Life European Project (DGENV) and CEPSA (Private company, Spain)(Life blue Natura).
- Interreg IV B Med.
- European Territorial Cooperation Programme.
- European Regional Development Fund.
- DGMARE (EASME).

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Creation of clusters for knowledge sharing. • Registration in the +hellix database (until july 2020). • Participation in the Mediterranean Blue Economy Day and the Mediterranean Stakeholder Platform. • Goal: Mapping of needs and share experience to increase understanding.	**How:**	Thematic Workshops and seminars.
		When:	At least annually.
Alignment and coordination	• GSO BLUEMED Working Group • DGMARE • SEA-EU (EU University of the Sea) • UFM Blue Skills program • BLUECloud Project	**How:**	1) Meetings, working groups and activities to define and identify needs. 2) Co-organise seminars/training events for professionals / students. 3) Co-organise Blue hackathon event (Blue Cloud).
		When:	
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Advisory Groups. • Research organizations. • Interact.	**How:**	
		When:	
Start-Up actions	• Fishing schools. • Blue Labs. • Blue Careers course.	**How:**	Calls.
		When:	Annually.
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	Promotion of the bluemed e-traing activities.	**How:**	Bluemed Website, Social Media.
		When:	2020.
Lobbying actions	Actions to highlight the importance of Sustainable blue careers.	**How:**	Workshops and meetings
		When:	

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Training and capacity building initiatives	1) BlueMed e-training. 2) Blue Labs. 3) Research organizations. 4) Specialized schools (e.g. fishing school, etc...). 5) Connection with the BlueMed. 6) Master Course for capacity. 7) SEA-EU. 8) UFM Blue Skills Programmes. 9) Blue "Hackathon[1]".	**How:**	Foster local dialogue amongst training institutions, businesses, and administrations.
		When:	2021.
Implementation Working Groups (IWG) on specific sectors	• GSO BLUEMED Working Group. • EU Advisory Groups (Aquaculture, Fishing, Seafood). • Research organizations.	**How:**	Meetings.
		When:	
Communication and engagement	• GSO BLUEMED Working Group. • EU Advisory Groups. • Research organizations. • Local Authorities. • Non-governmental organizations. • Blue-careers collectives. • SEA-EU.	**How:**	Foster local dialogue amongst training institutions, businesses, and administrations.
		When:	

1 The Idea of a Blue-hackathon is taken from the Climate-KIC Climathon it is a day where in many parallel cities individua/speliastits/companies organise to face and propose solutions for specific challenges. This idea expanded might work for other BlueMed Challenges also and could be achieved through the Mediterraneand Stakeholder Platform, or in relation to the Blue Economy Day organised by DGMARE, and maybe lead to different Start ups or further funding ideas BlueCloud is also...

FICHE 12

STRENGTHEN SYNERGIES AMONG SCIENCE, INDUSTRY, POLICY-MAKERS AND SOCIETY

CO-CHAMPION COUNTRIES: MALTA & JORDAN

Background

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 priorities with other relevant strategies, e.g. Regions).

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
BlueBRIDGE Building Research environments for fostering Innovation, Decision making, Governance and Education to support Blue growth	**Call:** H2020-EU.1.4.1.3. - Development, deployment and operation of ICT-based e-infrastructures **Duration:** 2015-2018	**EU Contribution:** € 5 295 753 **Website:** https://www.bluebridge-vres.eu/	Innovating current practices in producing & delivering scientific knowledge advice to competent authorities & enlarges the spectrum of growth opportunities in distinctive Blue Growth areas.
Support Action to initiate cooperation between the Communities of European MARine and MARitime REsearch and Science	Call: SST.2008.6.0.6. - Integration of Marine and Maritime Sciences in Waterborne Transport in support to the European Research Area **Duration:** 2009-2012	**EU Contribution:** € 498 085 **Website:** not available	To identify and establish appropriate mechanisms to strengthen the cross-sectoral and interdisciplinary cooperation, key ferment for innovation, between both research communities.
MARIBE Marine Investment for the Blue Economy	**Call:** H2020-EU.3.2. - SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy. **Duration:** 2015-2016	**EU Contribution:** € 1 977 951 Website: http://maribe.eu/	Socio-economic study to identify key opportunities for synergistic collaboration between private entities.

COLUMBUS Monitoring, Managing and Transferring Marine and Maritime Knowledge for Sustainable Blue Growth	**Call:** H2020-EU.3.2. - SOCIETAL CHALLENGES - Food security, sustainable agriculture and forestry, marine, maritime and inland water research, and the bioeconomy **Duration**: 2015-2018	**EU Contribution:** € 3 997 488 **Website**: http://www.columbusproject.eu/	To capitalise on the European Commission's significant investment in marine and maritime research by ensuring accessibility and uptake of research Knowledge Outputs by end-users: policy, industry, science and wider society.
COFASP ERANET (Strengthening cooperation in European research on sustainable exploitation of marine resources in the seafood chains- ERANET)	**Call:** FP7-KBBE **Duration:** 2015-2018	**EU Contribution:** € 2 737 158 **Website:** not available	To strengthen cooperation and synergies between European research programme owners and managers, focusing on the benefits and needs for the Fisheries, Aquaculture and Seafood Processing sectors.
GAP2 Bridging the gap between science, stakeholders and policy makers	**Call:** FP7-SIS **Duration:** 2011-2015	**EU Contribution:** € 5 913 773 **Website:** http://gap2.eu/	To promote and enable processes for open and effective participation of stakeholders in research and management, and demonstrate through specific examples and critical evaluation, the role and value of stakeholder driven science in the governance of fisheries and the marine environment.
MAESTRALE	**Call:** Interreg-MED 2014-2020 **Duration:** Unknown	**EU Contribution :** not available **Website :** https://maestrale.interreg-med.eu/	10 Blue Energy Labs developed as 40 laboratories involving research institutions, public authorities, SMEs and scientific experts. The intensive collaboration in the form of a participatory process all around the Mediterranean area; enabled the development of 20 pilot projects, for which feasibility and sustainability assessments demonstrated that Marine Renewable Energy technologies in the Mediterranean can be implemented.
4Helix+ Empowering the 4 helix of MED maritime clusters through an open source/ knowledge sharing and community-based approach in favour of MED blue growth	**Call:** Interreg-MED 2014-2020 **Duration:** 01/02/2018 - 31/07/2020	**EU Contribution :** €2 193 984 **Website :** https://www.cei.int/projects/4helix	Stimulating, coaching and funding creative innovation within the blue economy in the Mediterranean (MED) area, by improving the gap between the 8 Mediterranean regional maritime clusters and within their four helixes, through an open source, knowledge-sharing, and community-based approach.
MISTRAL Mediterranean Innovation Strategy for transnational activity of clusters and networks of the Blue Growth	**Call**: Interreg-MED 2014-2020 **Duration:** 48 months	**EU Contribution:** €4 100 000 **Website:** https://mistral.interreg-med.eu/	to promote and make effective a transnational BG ecosystem of innovation where SMEs and corporates, RTOs, higher education institutions, public sector, cooperate to: • develop sustainable innovation actions. • increase their innovation performance. • sustain the development of the entrepreneurial spirit. • increase the access and sharing of the marine knowledge.

APPLY Argumentation and Public PoLicY analysis	**COST ACTION:** CA17132 - European network for argumentation and public policy analysis **Duration:** Start of Action - 19/10/2018 End of Action - 18/10/2022	**Website:** https://www.cost.eu/actions/CA17132/#tabs|Name:overview	• Improves the way European citizens understand, evaluate and contribute to public decision-making on such matters of common concern as climate change or energy policies. • A multidisciplinary perspective on argumentation. • Identifies gaps between the citizens', policymakers' and scholarly experts' argumentation. • Explores ways of treating them. • Provides insights into the understanding, evaluation and production of public policy arguments.
OPP	**Call**: COST Action: IS1403 - Oceans Past Platform **Duration:** Start of Action - 17/11/2014 End of Action - 16/11/2018	**Website:** www.tcd.ie/history/opp/	• To measure and understand the significance and value to European societies of living marine resource extraction and production to help shape the future of coasts and oceans. • Lowers the barriers between human, social and natural sciences. • Multiply the learning capacity of research environments; and enable knowledge transfer and co-production among researchers and other societal actors. • Integrating historical findings of scale and intensity of resource use into management and policy frameworks.
MarCons	**Call**: COST Action: CA15121 - Advancing marine conservation in the European and contiguous seas **Duration:** Start of Action - 01/06/2016 End of Action - 31/05/2020	**Website:** www.marcons-cost.eu/	• Consolidate a network of scientists and stakeholders who are involved in marine conservation in European and contiguous seas, • Promote collaboration, reduce redundancy of research efforts in conservation science and practice, • Developing and promoting novel and relevant concepts, methods, and tools, provide support to the related European policies, and enable effective and informed decision-making for the improvement of marine conservation in the European Seas and adjacent regions, • Advancing the science of integrated conservation planning, promoting regional coordination and transboundary conservation, proposing specific conservation actions, accounting for climatic change and biological invasions, • Providing guidance for assessing governance issues to make marine spatially managed areas more effective, • Bridge the gap between conservation science and policy makers and substantially contribute to the challenge of halting biodiversity loss in the European Seas by 2020.

OCEANGOV	**Call**: COST Action: CA15217 - Ocean Governance for Sustainability - challenges, options and the role of science **Duration:** Start of Action - 28/09/2016 End of Action - 27/09/2020	**Website:** www.oceangov.eu/	• Strengthening regional and interdisciplinary dialogue, producing scientific output, crosscutting the natural and social sciences. • Creates a distinct multi-scalar and cross-sectoral platform for institutional partners across academia, policymaking and civil society, presenting inclusive spaces for transdisciplinary dialogue, capacity development and the advancement of practical toolkits that attend to science-policy gaps inherent within integrated ocean and coastal governance.

Programmes and initiatives of relevance, including research and data infrastructures

- UNEP Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem (MedPartnership) (https://mio-ecsde.org/project/project-4/).
- IUCN Mediterranean Marine Programme (https://www.iucn.org/regions/mediterranean/our-work/mediterranean-marine-programme).
- Mediterranean Blue Economy Stakeholder Platform (http://www.medblueconomyplatform.org).
- WestMED Initiative (https://www.westmed-initiative.eu/).
- EUSAIR (https://www.adriatic-ionian.eu/).
- Marine Strategy Framework Directive (MSFD) – ActionMed (https://actionmed.eu).

Target sectors and groups

- Horizon 2020 Science with and for Society (SwafS) Programme Committee.
- Horizon 2020 Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy Programme Committee.
- Horizon Europe Sub-Group on Mission Area Healthy Oceans, Seas, Coastal And Inland Waters.
- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- Sea Basin Strategy – Working Groups for Integrated Maritime Policy in the Mediterranean (https://ec.europa.eu/maritimeaffairs/policy/sea_basins/mediterranean_sea_en).
- European Neighbourhood Policy Project on Integrated Maritime Policy for the Mediterranean (https://eeas.europa.eu/diplomatic-network/european-neighbourhood-policy-enp_en).
- UNEPMAP (https://web.unep.org/unepmap/what-we-do/projects).
- IUCN World Commission on Protected Areas (https://www.iucn.org/commissions/world-commission-protected-areas/our-work/marine).

- UNESCO Science for Society (https://en.unesco.org/themes/science-society).
- Institute for Advanced Sustainability Studies (https://www.iass-potsdam.de/en).
- European Environmental Agency (https://www.eea.europa.eu/).
- COSCE Science and Society (https://www.cosce.org/science-and-society/).
- Waterborne Technology Platform (https://www.waterborne.eu/).
- International Council for the Exploration of the Sea (ICES) (https://www.ices.dk/Pages/default.aspx).

Funding options and agencies

- Science with and for Society (SwafS) calls Horizon 2020.
- Blue Growth calls Horizon 2020.
- European Maritime and Fisheries Fund (EMFF).
- JPI Oceans Calls.
- ERA-NET BlueBio Cofund.

- Bio-based Industries Joint Undertaking (BBJU).
- Interreg-Med calls.
- EEA grants.
- COST.

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Blue Labs. • Regional Maritime Clusters. • EU Advisory Groups. • International Symposia.	**How:**	
		When:	
Alignment and coordination	BLUEMED GSO Working Group.	**How:**	
		When:	
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	BLUMED GSO Working Group New funding mechanism e.g. 'JPI Mediterranean'.	**How:**	
		When:	
Start-Up actions	Continuation of BLUEMED CSA Start-up Actions bringing together countries from all shores of the Mediterranean.	**How:**	
		When:	
Start-Up actions	Continuation of BLUEMED CSA Start-up Actions bringing together countries from all shores of the Mediterranean.	**How:**	
		When:	

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	**Content and objective** [Champion countries describe in more detail the content and specific objective of a given activity]	**How and timeframe** [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects		**How:**	
		When:	
Lobbying actions		**How:**	
		When:	
Training and capacity building initiatives	• Mutual Learning workshops. • EU funding calls.	**How:**	
		When:	
Implementation Working Groups (IWG) on specific sectors		**How:**	
		When:	
Communication and engagement	• Continuation of BLUEMED CSA. • BLUEMED GSO Working Group. • EU Advisory Groups. • Social networks.	**How:**	
		When:	

FICHE 13

FROM TRADITIONAL MARITIME ECONOMIC TO BLUE GROWTH ACTIVITIES RELATED GOALS: E-D2. MEDITERRANEAN BLUE START-UPS

CO-CHAMPION COUNTRIES: CROATIA - ISRAEL

Background

Detection of Clustering of efforts within and across countries is a precursor to excellence and economic growth. Clusters have proven by the cooperation between their members: the exchange of scientific and technical knowledge, the development of innovative cooperative projects, the deployment of products from these projects on international markets, that they allow economic growth and rapid technological development in the Mediterranean region. They also allow the exchange of good practices between the two shores of the Mediterranean Sea.

Although it is imperative that countries in the Region move away from traditional models of economic growth to more sustainable blue activities seeking 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.

The process that brought to the last update of the BLUEMED SRIA (http://www.bluemed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf), involving CSA partners and national pivots, through the BLUEMED Platforms, identified for Goal E-D1. The following nine Actions (Also related to: 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, greenship, smartship, smartyard, sustainable coastal tourism, mineral resources in the high seas, biotechnologies, coastal ecological engineering, satellite data services, through federation of actors of research /industry, increasing visibility, international representation.

E-D1.3 Develop economic studies to identify the specialization of different areas and regional clusters and highlight more productive and sustainable activities.

E-D1.4 Establish innovative methodologies to assess the impacts of different programmes and actions on the evolution of maritime sectors and economy.

E-D2.1 Favour incubators and connect start-ups, investors, accelerators, entrepreneurs, corporate networks, universities for increasing innovative blue ecosystems.

Mapping and discussing implementation options and potentials of this priority

Recent and ongoing relevant projects

PROJECT	DESCRIPTION		OBJETIVES
VPSTTG VPS for Tidal Turbine Generators	**Call:** EASME/EMFF/2017/1.2.1.12 - Sustainable Blue Economy **Duration:** 01/01/2019-31/12/2020	**EU Contribution:** 992.936,00 € **Website:** https://ec.europa.eu/easme/en/vpsttg-vpsttg-vps-tidal-turbine-generators	VPS for Tidal Turbine Generators VPSTTG will design, manufacture and test an improved tidal turbine's pitch system – an important component enabling technology for more cost-effective tidal energy turbines. UK and Spain.

SpaceTech4Sea Implementing Aerospace Technology on Marine LNG Applications Promoting Sustainable Blue Economy Space	Call: EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/01/2019-31/12/2021	**EU Contribution:** 1.065.706,00 € **Website:** https://ec.europa.eu/easme/en/spacetech4sea-implementing-aerospace-technology-marine-lng-applications-promoting-sustainable-blue	Tech4Sea will demonstrate, validate and commercialise an innovative ultralight LNG fuel tank in the maritime sector, by utilising cutting-edge aerospace technologies and novel shipbuilding techniques. Greece and USA.
GREENing the BLUE	**Call:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 2015-2016	**EU Contribution:** 810.151,00 € **Website:** https://ec.europa.eu/easme/en/greening-blue-bound4blue-wingsail-demonstration-project	GREENing the BLUE presents the full-scale demonstration of a foldable wing sail solution based on aeronautical design, which reduces fuel use and pollutant emissions in maritime transport through wind energy co-propulsion. Spain and Germany.
ENSAMBLE Expertise and Networking to Sustain Actions in Med through Blue and Local Economy	**Call:** H2020-ART-2017-Two-Stages **Duration**: 01/06/2018 - 31/05/2021	**EU Contribution:** 19.802,512 € **Website**: https://ec.europa.eu/inea/en/horizon-2020/projects/h2020-transport/automated-road-transport/ensemble	ENSAMBLE will promote twinning activities among local coastal communities, and other relevant stakeholders, for the sustainable development of the fishing sector. Italy, France and Tunisia.
EASY FEED: Eco-aquaponics systems – 100% sustainable and profitable EU fish-farming **SRIA Action:** D2.1 / D2.4	**Call:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01 January 2019 – 01 December 2021	**EU Contribution:** 438.563,00€ **Website:** https://easyfeed-project.eu/#	EASY FEED will validate the use of an innovative aquaculture organic feed formula, based on locally grown quinoa and spirulina, to reduce the aquaculture sector's dependence on marine resources.
DEMO-BLUESMARTFEED: Demonstration project of a smart technology for monitoring the delivery of feed for a sustainable aquaculture **SRIA Action:** D2.4	**Call:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01 January 2019 – 01 December 2021	**EU Contribution:** 740.615,00€ **Website:** http://bluesmartfeed.eu/	DEMO-BLUESMARTFEED will validate the SICA technology (Smart System for Feeding Control) to monitor and optimise aquaculture feed supply, hence reducing feed waste. The aim of this proposal is to validate the SICA technology (Smart System for Feeding Control) in two real environments (offshore cages) in Spain and Greece.

AlgaeDemo Demonstration of large-scale seaweed cultivation at open sea and the positive effects thereof on the ocean	**Call:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/01/2019 – 31/12/2021	**EU Contribution :** 999.832,00€ **Website :** https://ec.europa.eu/easme/en/algaedemo-demonstration-large-scale-seaweed-cultivation-open-sea-and-positive-effects-thereof-ocean	AlgaeDemo aims to demonstrate the sustainable, large-scale (1.4 ha) industrial cultivation of selected seaweed species at open sea, with automated seeding, harvesting and monitoring. Belgium and The Netherlands {Not in the Mediterranean, but relevant}.
BLUENET Creating new life for discarded fishing and aquaculture gears to prevent marine litter generation	**Call:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/02/2018 – 31/07/2020	**EU Contribution :** 550.691,00 € **Website :** https://www.bluenetproject.eu/	BLUENET will set up a programme for recycling abandoned, lost or discarded fishing and aquaculture gear: recovering gear from the sea and using it as raw material to manufacture new gear. Spain and Italy.
OCEANETS Technological approaches for circular economy solutions in terms of prevention, recover, re-use and recycle of fishing gears to obtain added-value products in the textile industry	**Call**: EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/01/2019- 31/12/2020	**EU Contribution:** 426.060,00€ **Website:** http://oceanets.eu/	OCEANETS will develop an ICT tool to prevent fishing gear loss and optimise the recycling technologies to produce high-quality fabrics from plastic nets. Spain and Czech Republic.
Cluster ACT Aggregation and Collaboration Tools to enhance cluster network in the maritime sector	**COST ACTION:** EASME/ EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** Start of Action – 19/10/2018 End of Action – 18/10/2022	**EU Contribution:** 587.533,00 € **Website:** https://ec.europa.eu/easme/en/cluster-act-aggregation-and-collaboration-tools-enhance-cluster-network-maritime-sector	Cluster ACT will develop a mechanism for maritime clusters' networking and collaboration with private investors to enhance innovation and business development. Italy, Spain, Greece, Croatia and Egypt. The project involves different types of actors (clusters, research organizations, association of private investors) that will act in the maritime field, with a specific focus on the sub-sectors strongly liked to tourism in the 5 Mediterranean countries (Italy, Spain, Croatia, Egypt, Greece): leisure boating, cruising, ports and marinas.
ArtReefs Innovative, competitive and integrated tools for sustainable coastal tourism and inclusive Blue Growth in the Mediterranean and Black seas	**Call**: EASME/ EMFF/2015/1.2.1.7 – Projects in the context of the Integrated Maritime Policy in the Black Sea and/or Mediterranean Sea regions **Duration:** 01/08/2016 – 31/07/2018	**EU Contribution:** 167.520,00 € **Website:** http://www.artreefs.eu/	The objective of the ArtReefs project is to pilot a public-private partnership, inviting cross-sectoral stakeholders across the Mediterranean and Black Sea Basins. It aims at promoting and facilitating the use of artificial reefs as effective and affordable tools to boost innovative and sustainable coastal and maritime tourism, while offering inclusive opportunities for transversal Blue Growth across a wide range of compatible activities that combine economic, social and environmental benefits.

MedSkippers	**Call**: EASME/EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/12/2018-31/11/2021	**EU Contribution:** 499.910,00 € **Website:** https://medskippers.com/project	Professional skippers in the Mediterranean (MedSkippers) aims to harmonise the training and recognition of professional skippers of small commercial vessels and expand their skill set to boost the nautical charter sector. Spain, Cyprus, Greece and Morocco.
CMES-WestMed	**Call**: EASME/EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** 01/01/2019 – 31/12/2020	**EU Contribution:** 499.055,00 € **Website:** https://ec.europa.eu/easme/en/cmes-westmed-common-maritime-education-standards-west-mediterranean	Developing Education and Employment Partnerships for a Sustainable Blue Growth in the Western Mediterranean Region DEEP BLUE will promote collaboration between marine and maritime education, research, and training centres to strengthen relevant skills and increase capacity building for blue career development. Italy, Spain and Tunisia.
DEEP BLUE Developing Education and Employment Partnerships for a Sustainable Blue Growth in the Western Mediterranean Region	**Call:** EASME/EMFF/2017/1.2.1.12 – Sustainable Blue Economy **Duration:** July 2009-June 2013	**EU Contribution**: 475.678,00€ **Website:** http://mamba.habgor.ac.uk/media.php	DEEP BLUE will promote collaboration between marine and maritime education, research, and training centres to strengthen relevant skills and increase capacity building for blue career development. The DEEP BLUE project aims at developing skills and building capacities throughout enhancing geopolitical dialogue and international scientific cooperation (Science Diplomacy) in the Western Mediterranean Region.

Programmes and initiatives of relevance, including research and data infrastructures

Marine Data:

The three main relevant EU initiatives are:

1. The Copernicus Marine Environment Monitoring Service (CMEMS) which provides space data and oceanographic forecasts.
2. The Data Collection Framework which supports the collection and processing of fisheries and aquaculture data. The EU contribution over the seven years of the programme will be EUR 520 million which covers 80% of the total expenditure.
3. The European Marine Observation and Data Network (EMODnet) which assembles processes and distributes all other marine data and data products and is funded via EMFF.

Other relevant data networks funded by the EU include:

- SeaDataNet (SDN) - a major pan-European infrastructure for ocean and marine data and gives access to high quality multidisciplinary data (physical oceanography, marine chemistry, geology, bathymetry, geophysics, and biology).
- SIMEDD - The system developed and maintained by Plan Bleu.
- Fisheries data is managed by GFCM (catch, fleet register), with some relevant projects such as MEDITS (bottom trawl surveys).
- CIESM, the Mediterranean Science Commission runs taxonomy and bio-invasions databases.
- Eionet (European Environment Information and Observation Network) – Environmental Data.
- PERSEUS - Oceanographic Mediterranean and Black Sea Data Management funded by the EU under FP7 Theme "Oceans for Tomorrow" – Mainly Cast Data Base with vertical profiles of physical, chemical and biological data acquired with Bottle casts (Rosette), CTD casts, and Argo floats.

Target sectors and groups

Clusters markets objectives can be deduced from the selected priorities of the SRIA and its connected actions. Main markets, either mature or emerging are:

- Naval (greenship, smartship) and nautism: Logistics and shipping focused on intelligent transport, such as energy performance, alternative fuels, security, eco-design, autonomy, multimodal, etc.
- Port infrastructures: Greenyard in order to limit the impact of port activity. Smartyard and digital: automation and process and cyber security.
- Marine energy resources especially innovative technologies for offshore wind turbines and development of co-activities (offshore aquaculture, etc.).
- Marine biological resources: Sustainable fishing, processing and marketing of fishery products, fishing gear and instrumentation and services (pesca-tourism).
- Sustainable aquaculture, formulated food, fish and shellfish hatchery, magnification (cage, basins, monitoring instrumentation).
- Blue biotechnologies: bioresources for humans (cosmetics, pharmaceuticals, agrifood) and for the energy and ecological transition (pollution control, bioremediation, bio-based materials).
- Environment and development of the coast: Ecological engineering, highlight the services provided by marine ecosystems and nature-based solutions, reduction of coastal vulnerability and increase it for resilience to extreme events.
- Sustainable coastal tourism.

Challenges must be grouped around 3 strategic transversal axes: Digital Transformation, Ecological Transition and Energy transition.

A strong recommendation to boost economic growth and competitiveness implemented by marine clusters for blue growth are:

- Each cluster must organize its innovations according to Areas of Strategic Action, ASA, these areas being markets oriented, matures or emerging markets. A number of 5-6 strategic action areas is recommended.
- All maritime clusters should agree to define the same strategic action areas, as this would strengthen collaboration between clusters. There will certainly be different contents or weight in country' cluster because this content depends on the different economic and research contexts in each country.

Clusters could use different process to stimulate innovation:

- In order to stimulate disruptive innovation, it is interesting to favour certain organizations such as cross-fertilization of technological fields and markets, for example by organizing "maritime hackathons", which will allow better integration of new technologies from the sectors to cluster members and their markets.
- A useful process is "open innovation" which is a way for companies to benefit from external ideas/technologies (Outside-In) and valorise internal ideas/technologies with external partners (Inside-Out) to reduce the financial risks associated to innovation, and quickly get a competitive advantage. As such it implies accelerating internal R&D and innovation along value chains through collaboration between the technological supply - and demand – side. Open innovation needs to be operational and this is done possible through networked, multi-collaborative ecosystems involving representative maritime clusters or intermediaries.

Maritime Clusters

- European Network of Maritime Clusters (ENMC) (https://enmc.eu/about-us/).
- Pole Mer Mediterranee (https://www.polemermediterranee.com/).

Intergovernmental bodies:

- Union for Mediterranean (UfM) (https://ufmsecretariat.org/).
- EC-DG Mare (https://ec.europa.eu/maritimeaffairs/home_en).
- UNEP/MAP (http://web.unep.org/unepmap/) and its Regional Centers.

- IOC-UNESCO (http://msp.ioc-unesco.org/).
- Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org/science/).
- FAO – Aquaculture (http://www.fao.org/aquaculture/en/).
- FAO – Fishing (http://www.fao.org/fisheries/en/).
- FAO – Sustainable Food (http://www.fao.org/sustainability/en/).
- World Tourism Organization - UNWTO (https://www.unwto.org/).

Research bodies, businesses and local authorities

- European Environmental Agency (https://www.eea.europa.eu/).
- The European Fisheries Areas Network (FARNET) (https://ec.europa.eu/fisheries/cfp/eff/farnet_en).
- Mediterranean Advisory Council (http://en.med-ac.eu/index.php).
- European tourism association (https://www.etoa.org/).

Thematic platforms

- European Circular Economy Stakeholder Platform, Platform to exchange and interact, and make circular economy happen faster (https://circulareconomy.europa.eu/platform/).
- Blue Bioeconomy Platform (https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1349).
- Tourism Business Portal (https://ec.europa.eu/growth/sectors/tourism/business-portal_en).
- Enterprise Europe Network: tourism and cultural heritage (https://een.ec.europa.eu/).

Funding options and agencies

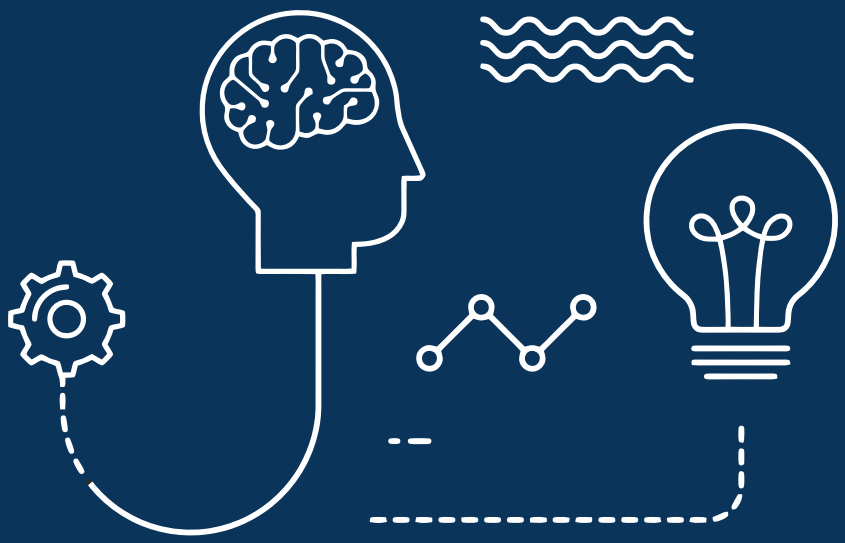
Relevant funding programs as listed in WestMed:

- BLUEMED Call for Start-up Actions.
- Cross Border Cooperation within the European Neighborhood Instrument – Mediterranean Sea Basin Programme 2014-2020.
- European Commission – Annual work programme for grants and procurement.
- European Investment Bank.
- European Maritime and Fisheries Fund (EMFF).
- Horizon 2020.
- Interreg Mediterranean (Meeting on 24th October 2019, in Athens - the Interreg MED Programme projects' communities will unfold their results).

Activities to promote the SRIA Implementation

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Networking and engagement of economic sectors and national Blue Growth communities	• Attend Sustainable Ocean Summit - Investing in Ocean Futures: Finance and Innovation for the Blue Economy. Paris, France. • Participation in events organised by marine and maritime clusters/ networks. • Business-to-business meetings and research cooperation in the field of marine and maritime economic growth.	**How:**	Participating and contributing to the meetings.
		When:	2020-2023.

Examples of activities [Champion countries must choose those activities that suit best the priority addressed]	Content and objective [Champion countries describe in more detail the content and specific objective of a given activity]	How and timeframe [Champion countries explain how the activity can be carried out and timeframe within the IP (2020-2023)]	
Promotion and possibly implementation of actions coordinated and jointly undertaken by different countries, with a "variable geometry" approach	• Promotion in the Med and European levels through national ministries and agencies relevant for marine and maritime economic sectors. • Promotion through existing maritime and marine clusters and networks, particularly towards economies in transition.	**How:**	Presentations of BLUEMED to the meetings, dedicated round tables, high-level meetings.
		When:	2020-2023.
Start-Up actions	Identification of pathways of trans-national collaboration within the Mediterranean marine and maritime economic sectors.	**How:**	Joint work on common activities and identification of gaps and opportunities.
		When:	2021-2023.
Assessment and promotion of the capitalisation and valorisation under the BLUEMED umbrella of ongoing and future projects	• Participation of BLUEMED at the high-level Mediterranean and European meeting on blue growth. • Participation of BLUEMED at EurOCEAN Conferences. • Participation of BLUEMED at the Final Conference of the ADRION programme. • Participation of BLUEMED at the Capitalization Phase of the project MED-PHAROS4MPAS (Blue Economy and Marine Conservation: Safeguarding Mediterranean MPAs in order to achieve Good Environmental Status).	**How:**	Presentations of BLUEMED to the meetings, dedicated round tables.
		When:	2020-2023.
Lobbying actions	Actions towards regional activities and programmes (e.g. Interreg, PRIMA), for including BLUEMED issues in their strategic agendas.	**How:**	Bilateral meetings with high officials of programmes.
		When:	2020-2023.
Training and capacity building initiatives	• Training courses about marine and maritime economic growth for non-EU countries. • Initiating secondments between key and less developed marine and maritime players.	**How:**	Organising international training activities, workshops and summer schools.
		When:	2020-2023.
Implementation Working Groups (IWG) on specific sectors	Create GSO BLUEMED Working Groups and/or EU Advisory Groups.	**How:**	Meetings.
		When:	Annually.
Communication and engagement	Thematic Event on marine and maritime issues in the Mediterranean, at the BLUEMED Final Conference News, announcements, new materials, etc.	**How:**	Dedicated Session at BLUEMED Final Conference/ Website, social networks (twitter, facebook, instagram, etc.).
		When:	September 2020 / Social media during the whole process.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727453

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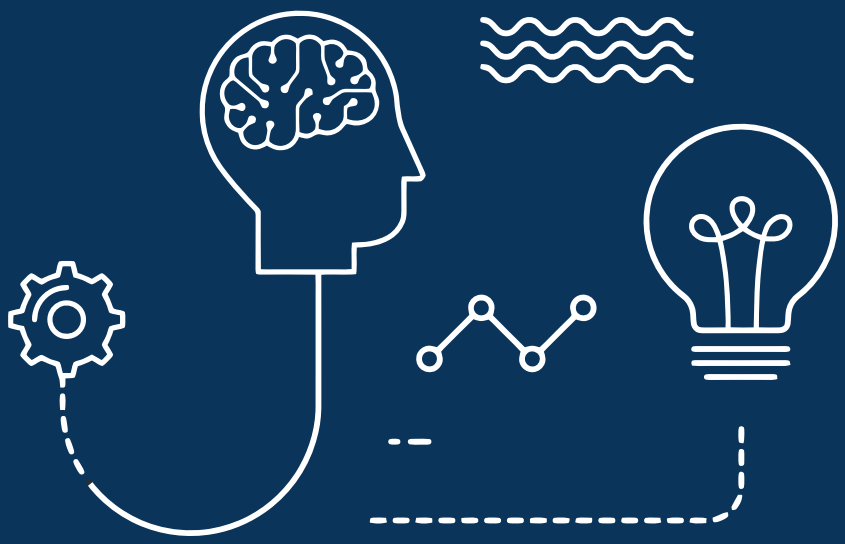

BLUEMED

PRELIMINARY IMPLEMENTATION PLAN

Horizon 2020 – BG-13-2016
Grant Agreement 727453

ANNEX 2
GUIDELINES FOR IMPACT EVALUATION

June 2020

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PRELIMINARY IMPLEMENTATION PLAN

Horizon 2020 – BG-13-2016
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ANNEX 2
GUIDELINES FOR IMPACT EVALUATION

June 2020

Authors:

Fabio Trincardi (CNR, Italy)
Margherita Cappelletto (CNR, Italy)
Andrea Barbanti (CNR, Italy)
Jean-François Cadiou (IFREMER, France)
Amélie Bataille (CNRS, France)
Mónica Campillos Llanos (IEO, Spain)
Esther Chacón Campollo (AEI, Spain)
Abraham Trujillo Quintela (AEI, Spain)

ANNEX 2 – GUIDELINES FOR IMPACT EVALUATION

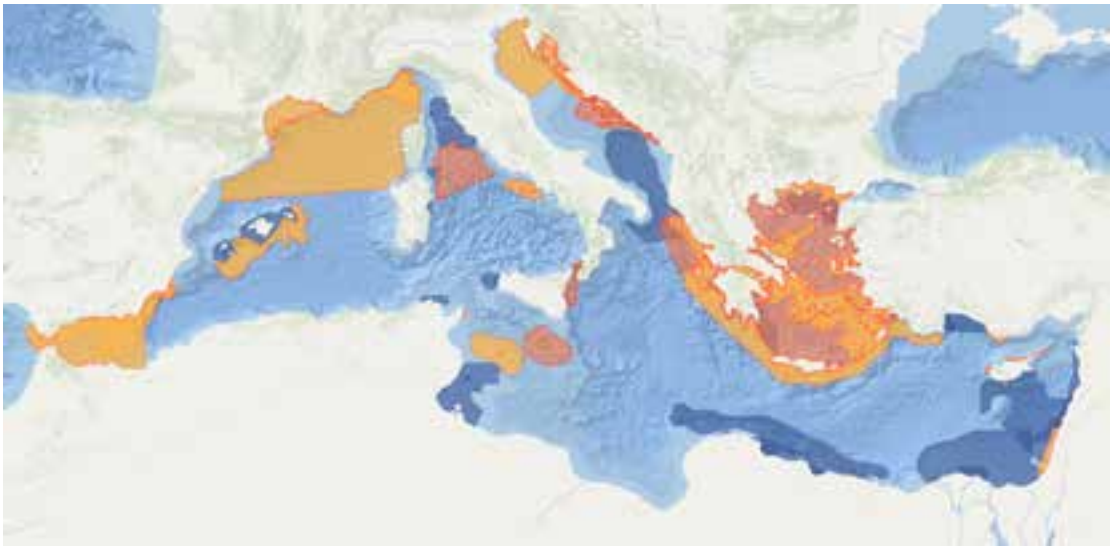
The following part of the document aims at providing some guidelines and details to facilitate the use of indicators dedicated to BlueMed impact evaluation, providing examples and recommendations on their objectives and the way to use them. Those indicators have been drafted according to already existing information, data and literature in order to facilitate evaluation activities. Major databases such as World Bank, OECD, Eurostat, MED POL and reports from UNEP/MAP, Plan Bleu have been very useful to produce the following annex.

Surface of coastal and marine protected areas in km²
P1_IND01
Definition: Measuring the sum of all surfaces of coastal and marine protected zones for a given year.
Unit: Km²
Measurement frequency: annual measure
Geographical coverage: national scale, coastal and marine areas scale measurement
Expected outcomes: improving managing solution and conservation plan to protect coastal and deep-sea ecosystems and reduce the loss of biodiversity. The surface of coastal and marine protected areas is therefore expected to increase in the following years.
Limits/precaution for use: legislations on preservation of natural and cultural spaces can be different according to countries. The International Union for Conservation of Nature can help to provide some common standards[1].
References/data sources: International Union for Conservation of Nature

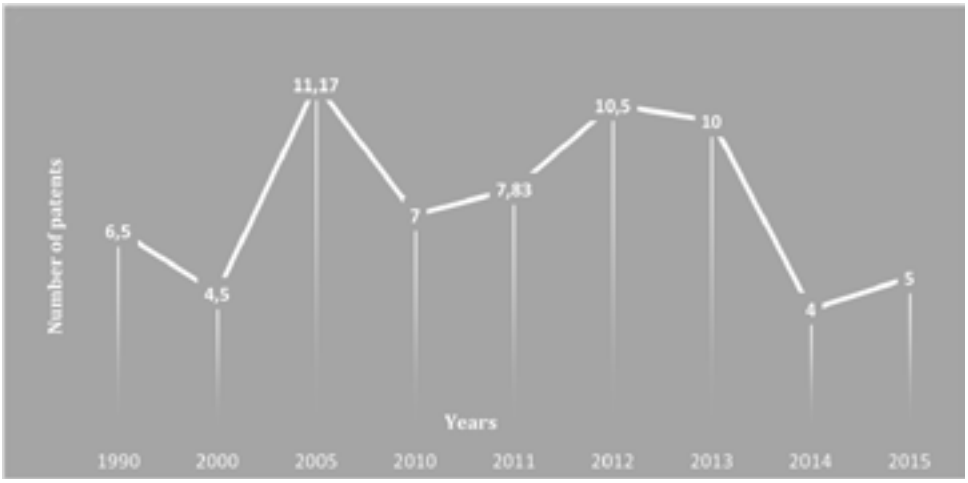
TREND:

MEDTRENDS (WWF) – MARINE PROTECTED AREAS IN THE MEDITERRANEAN

1 IUCN

Surface of marine mammal protected areas in km²
P1_IND02
Definition: Certain portions of sea habitats are considered as being very important to marine mammal species and their ecosystem health needs to be taken into consideration by governments, intergovernmental organisations, conservation groups and public[2]. These areas are marine mammals protected areas and this indicators offers to measure their surface in the Mediterranean basin. Example: the Pelagos Sanctuary.
Unit: km²
Measurement frequency: annual measure
Geographical coverage: national scale, coastal and marine areas scale measurement
Expected outcomes: increase the surface of these areas (creation of new sanctuaries, corridors for migration…) to strengthen best practices for marine mammals' conservation. Further studying the consequences of noises emitted by human activities at sea on ecosystems could encourage the development of new protected zones for marine mammals.
References/data sources: Marine Mammals Protected Areas Task Force
TREND:  MMPATF – IMPORTANT MARINE MAMMALS AREAS (ORANGE), CANDIDATE IMMA (RED), AREAS OF INTEREST (BLUE)

2 Definition from Marine Mammals Protected Areas Task Force

Number of patents in the field of climate change mitigation technology developments related to plastics recycling
P1_IND03
Definition: assessment of countries' and firms' innovative performance as well as the design of governments' environmental and innovation policies[3] related to climate change mitigation technology and solutions to tackle plastic pollution.
Unit: Number (family size: one and greater)
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: One of BlueMed's objective and the role of the Pilot Action on a Healthy, Plastic-free Mediterranean Sea is to address the issue of plastic marine litters in the Mediterranean Sea. Innovation in waste management is required and the number of patents in the domain is expected to increase in the following years.
Limits/precautions for use: Not all inventions or innovations are patented. Measuring the number of patents by itself does not provide information on their relative importance and impact.
References/data sources: OECD
TREND:    OECD – Total number of patents in the field of climate change mitigation technology development related to plastic recycling, the example of Italy (family size: one and greater)

3 OECD

Number of visitors on BlueMed Website page dedicated to the Pilot Action on a Healthy Plastic-free Mediterranean Sea
P1_IND04
Definition: number of clicks on the page dedicated to the Pilot Action on BlueMed Website
Unit: number
Measurement frequency: monthly measure
Expected outcomes: this number is expected to increase as the scaling up of the Pilot Action will increase its visibility.
Reference/sources: BlueMed website

Concentration of key harmful contaminants measured in the relevant matrix (biota, sediment, seawater)
P1_INDXX
Definition: measuring the amount of heavy metals (cadmium, mercury and lead, major MED POL contaminant group, lot of data). Different matrices can be considered: bivalves; fish and sediments.
Unit: µg/kg dw
Measurement frequency: annual measure
Geographical coverage: coastal areas
Expected outcomes: those numbers are expected to decrease in the following years
Reference/sources: UNEP/MAP ECAP / MED POL Database

Trends in the amount of litter washed ashore and/or deposited on coastlines
P1_INDXX
Definition: this Good Environmental Status indicator should be adjusted in the framework of BlueMed to focus on the amount of **plastic** litters found on Mediterranean **beaches**.
Unit: tonnes? Number of items per 100m?
Measurement frequency: annual
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to decrease in the following years
Limits/precautions for use: limited clear data and information in the Mediterranean, multitude of NGOs, associations and initiatives leading their own cleaning and monitoring operations. There is a need to co-ordinate the data collected at local scales to have a global picture.
Reference/sources: UNEP/MAP ECAP/ UN Environment/MAP 2015 Marine Litter Assesment

Actual levels of contaminants that have been detected and number of contaminants which have exceeded maximum regulatory levels in commonly consumed seafood
P1_INDXX
Definition: measuring the number of detected contaminants to which human beings are exposed through commercial fish and shellfish species and measure their deviation from legal permissions set by national, European or international (WHO standards) regulations.
Unit: ?
Measurement frequency: annual measurement
Geographical coverage: national or sub regional scale
Expected outcomes: this number is expected to decrease in the following years
Limits/precautions for use: lack of data. Different contaminants legal permissions exist according to the countries. There may be a need for protocols and assessment methodologies harmonization before using this indicator.
Reference/sources: UNEP/MAP ECAP / national databases and surveys, national food laboratories, inspection and regulatory bodies.

Trend:

Table 1. Regulatory levels, reference legislation, code and foodstuff categories.

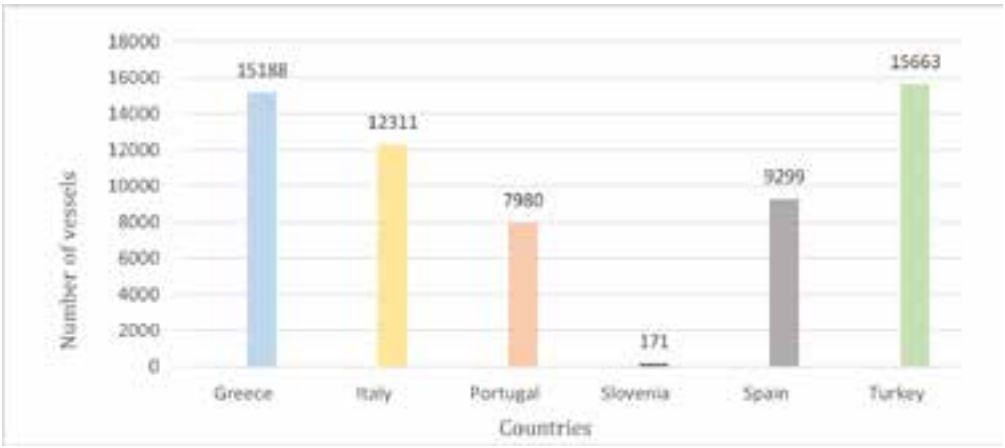
Category code	Legislation	Foodstuff	Regulatory levels
Cd 3.2.5	Reg.1881/2006/CE	Muscle meat of fish (footnote 24)	0.05 mg/kg w.w.
Cd 3.2.6	Reg.1881/2006/CE	Muscle meat of listened fish	0.10 mg/kg w.w.
Cd 3.2.8	Reg.1881/2006/CE	Crustaceans	0.50 mg/kg w.w.
Cd 3.2.9	Reg.1881/2006/CE	Bivalve molluscs	1.0 mg/kg w.w.
Cd 3.2.10	Reg.1881/2006/CE	Cephalopods	1.0 mg/kg w.w.
Hg 3.3.1	Reg.1881/2006/CE	Fishery products and muscle meat of fish (footnotes 24, 25, 26)	0.50 mg/kg w.w.
Hg 3.3.2	Reg.1881/2006/CE	Muscle meat of listened fish	1.0 mg/kg w.w.
Pb 3.1.5	Reg.1881/2006/CE	Muscle meat of fish (footnote 24)	0.3 mg/kg w.w.
Pb 3.1.6	Reg.1881/2006/CE	Crustaceans	0.50 mg/kg w.w.
Pb 3.1.7	Reg.1881/2006/CE	Bivalve molluscs	1.5 mg/kg w.w.
Pb 3.1.8	Reg.1881/2006/CE	Cephalopods	1.0 mg/kg w.w.
Dioxins 5.3	Reg.1259/2011/CE	Muscle meat of fish and Bivalve molluscs	3.5 pg/g w.w.
Sum dioxins and dioxin like PCBs 5.3	Reg.1259/2011/CE	Muscle meat fish and Bivalve molluscs	6.5 pg/g w.w.
Benzo(a)pyrene 6.1.4	Reg.1881/2006/CE	Muscle meat of fish (footnote 24)	2.0 μg/kg w.w.
Benzo(a)pyrene 6.1.5	Reg.1881/2006/CE	Crustaceans and Cephalopods	5.0 μg/kg w.w.
Benzo(a)pyrene 6.1.6	Reg.835/2011/CE	Bivalve molluscs	5 μg/kg w.w.
Sum PAH 6.1.6	Reg.835/2011/CE	Bivalve molluscs	30 μg/kg w.w.

doi:10.1371/journal.pone.0108463.t001

Summary of current regulatory levels set by the EU (extracted from Maggi et al., 2014; PLOS ONE Journal)

Fisheries technology development
P2_INDXX
Definition: total number of inventions related to fisheries developed in a given country. It assesses the innovative performances of the firms implied and the innovation policies implemented by governments. Data linked to this indicator can be subdivided in several categories: - All domains of fishery (total number of patents); - Aquaculture technology (new methods to grow fish in captivity) ; - Harvesting technology (new ways to find or harvest fish, improvements in catch); - New products and markets (food technology/processing, improvement of market access, incentives for green growth).
Unit: Number (family size: one and greater)
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: BlueMed initiative aims at developing optimal fishing strategies, technologies and practices. Therefore, fisheries technology development is expected to increase in the following years.
Limits/precautions for use: Not all inventions or innovations are patented. Measuring the number of patents by itself does not provide information on their relative importance and impact.
References/data sources: OECD

Economic value of fisheries, as a percentage of GDP
P2_INDXX
Definition: measuring economic benefits of fisheries in Mediterranean countries.
Unit: percentage of GDP
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: Improve fish trades and encourage public authorities to develop additional legislation for food control at Mediterranean level in order to preserve marine ecosystems and fish stocks. At the same time, it is important to protect jobs and professionals who depend on fisheries activity.
Limits/precautions for use: This indicator measures benefits made by all fisheries, not only those using sustainable fishing techniques.
References/data sources: The state of world fisheries and aquaculture – FAO report 2018

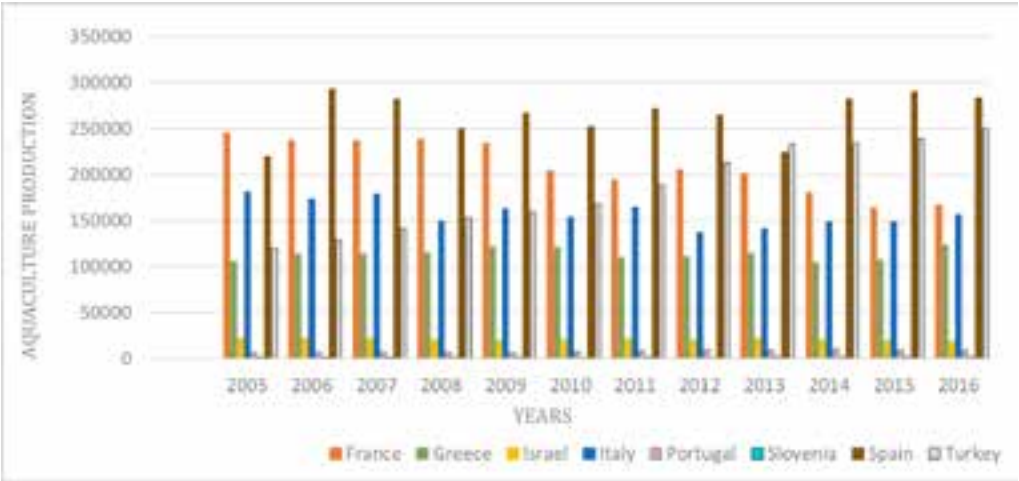
Fishery fleet, total number of vessels
P2_INDXX
Definition: The term **"**fishery fleet" refers to mobile floating objects of any kind and size, operating in freshwater, brackish water and marine waters which are used for catching, harvesting, searching, transporting, landing, preserving and/or processing fish, shellfish and other aquatic organisms, residues and plants. The term "fishing vessel" is used instead when the vessel is engaged only in catching operations. The term "non-fishing vessel" applies to vessels performing other functions related to fisheries, such as supplying, protecting, rendering assistance or conducting research or training[4].
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: assess a detailed number of vessels to have a clear picture of the situation and a better control of fishing activities.
References/data sources: OECD/The state of world fisheries and aquaculture – FAO report 2018
Trend:  OECD – Fishing fleet, total number of vessels, the example of 6 Mediterranean countries, 2016

4 FAO

Fisheries capture of marine fishes in tonnes
P2_INDXX
Definition: measuring the volumes of fish catches landed by a country for all commercial, industrial, recreational and subsistence purposes[5].
Unit: tonnes
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: improve fish trades and encourage public authorities to develop additional legislation for food control at Mediterranean level in order to preserve marine ecosystems and fish stocks. At the same time, it is important to protect jobs and professionals who depend on fisheries activity.
Limits/precautions for use: illegal fishing practices are still recurrent but not taken into account by this indicator.
References/data sources: FAO Statistics The state of world fisheries and aquaculture – FAO report 2018

Economic value of aquaculture, as a percentage of GDP
P2_IND
Definition: measuring the economic benefits of aquaculture in Mediterranean countries.
Unit: percentage of GDP
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: BlueMed aims at studying and evaluating the best processes to adapt and diversify aquaculture activities (species and systems) and capacities in a changing environment. Developing aquaculture activities is a way to ease the pressure on fish stocks and marine ecosystems, and at the same time it is a source of social and economic benefits thanks to the creation of new skilled jobs. BLUEMED also aims at developing multipurpose maritime facilities, such as offshore platforms, which could be dedicated to both observation, scientific research and aquaculture activities. Therefore, the benefits made by a more sustainable aquaculture are expected to increase in the following years.
Limits/precautions for use: measures the economic values of all aquaculture activities, not only those using sustainable techniques.
References/data sources: The state of world fisheries and aquaculture – FAO report 2018

5 World Bank Open Data

Aquaculture production in tonnes
P2_IND
Definition: measuring the total output from aquaculture activities, which are designated for final harvest for consumption. Aquaculture is understood as the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants[6].
Unit: tonnes
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to increase in the following years.
Limits/precautions for use: assesses the production of all aquaculture activities, not only those using sustainable techniques.
References/data sources: _ The state of world fisheries and aquaculture – FAO report 2018 / OECD
Trend:  OECD – Total aquaculture production, the example of different Mediterranean countries – in tonnes

6 World Bank Open Data

Proportion of fish stock within safe biological limits
P2_IND
Definition: measuring the proportion of fish stocks or species that are exploited within the level of *maximum sustainable biological productivity* (= the maximum catch that ensure maximum productivity while maintaining biodiversity and preserving functioning ecosystems)[7]. This indicator directly indicates the level of progress needed to tend towards sustainable management of fish stocks and it can have an impact on policy and decision-making.
Unit: percentage
Measurement frequency: annual measure
Geographical coverage: regional scale measurement
Expected outcomes: improve fish trades and encourage public authorities to develop additional legislations for food control at Mediterranean level. It is expected to avoid overfishing and mitigate impacts of fisheries on stocks, species and ecosystems. Prevent the decrease of the proportion of fish stock within safe biological limits, therefore, this number is expected to diminish.
References/data sources: The state of world fisheries and aquaculture – FAO report 2018 / OECD / Eurostat

Number of fish threatened species
P2_IND
Definition: anthropogenic pressures have a direct impact on marine ecosystems. Direct threats to fish species are the proximate human activities (such as unsustainable fishing). The International Union for Conservation of Nature established a red list of threatened species that are those classified as being endangered, vulnerable, rare, indeterminate, out of danger, or insufficiently known[8].
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: encourage Mediterranean countries to update their databases on fish threatened species to establish a clear picture of the situation to find sustainable solutions and make this number decrease. The situation is expected to improve thanks to a better surveillance and control of illegal fisheries that endanger marine ecosystems.
Limits/precautions for use: data collection highly variable depending on countries
References/data sources: the International Union for Conservation of Nature (IUCN) Red List of Threatened Species / World Bank Open Data

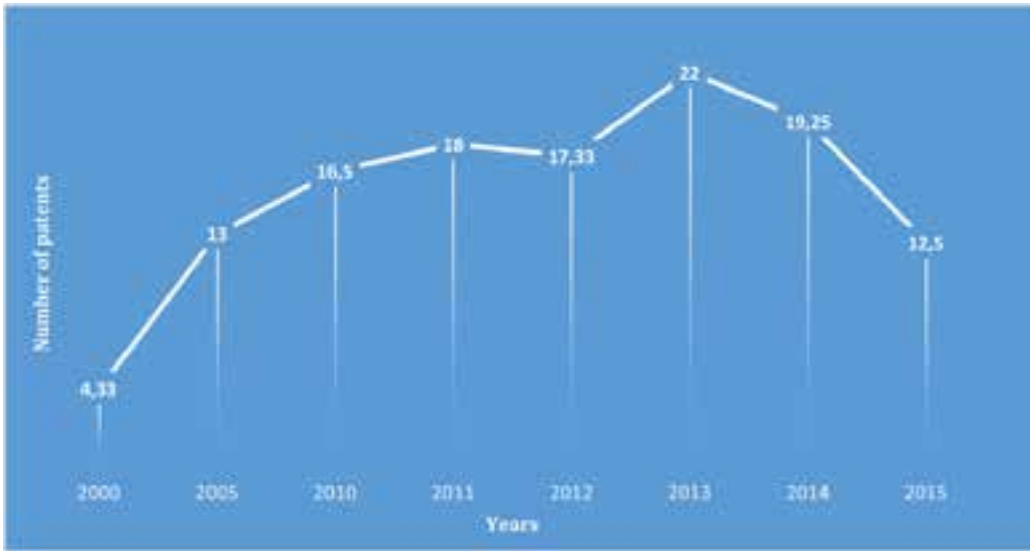
7 http://mdgs.un.org/unsd/mi/wiki/7-4-Proportion-of-fish-stocks-within-safe-biological-limits.ashx
8 Froese R. and Pauly D., 2008.

Number of fishers and fish farmers
P2_IND
Definition: This indicator measures the socio-economic impact of fisheries and aquaculture sector in Mediterranean countries**.** According to FAO, fishers and fish farmers are: 1. All commercial, industrial and subsistence fishers, operating in freshwater, brackish water, and marine waters in economically inspired efforts to catch and land any of the great variety of aquatic animals and plants, should be included. People working on fish farms, hatcheries, and employed in shellfish culture operations, should also be included. The term "fisher" should include not only those operating from fishing vessels of all types, but also those operating land-based fishing gears and installations from the banks of rivers, lakes, canals, dams etc., and from beaches and shores which do not require the use of auxiliary boats. Where possible a breakdown by the type of activity should be included. 2. The crews on fish factory ships, mother ships to fishing fleets, and on auxiliary craft such as, fish carriers, and fish transport craft should be included. 3. The data collected nationally should include nationals, and others employed on nationally registered vessels landing their catches in foreign ports. 4. The crews of state-operated fishery patrol vessels, fishery protection vessels, hospital ships, etc. should be excluded from the fishers statistics[9].
Unit: number (expressed in thousands)
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: increase the number of skilled jobs related to sustainable fisheries and fish farms in the following years.
Limits/precautions for use: measures all the jobs related to fishery and aquaculture, not only those using sustainable techniques. It would be interesting to subdivide this indicator to have separate data for fishing and aquaculture activities.
References/data sources: The state of world fisheries and aquaculture – FAO report 2018

9 FAO

Total number of patents in the field of climate change mitigation technology development
P3_IND
Definition: assessing countries' and firms' innovative performance as well as the design of governments' environmental and innovation policies[10] related to climate change mitigation technology. Patents are classified according to "family sizes", a term that designates the number of countries where the patent application has been filed. Family size "one and greater" means that the invention is protected in at least one country. This category includes all patents. Family size "two and greater' will count inventions that have sought protection in at least two countries, and so on[11]...
Unit: number (family size: one and greater)
Measurement frequency: annual measure
Geographical coverage: national scale measurement.
Expected outcomes: increase this number
Limits/precautions for use: not all inventions or innovations are patented. Measuring the number of patents by itself does not provide information on their relative importance and impact.
References/data sources: OECD

Trend:

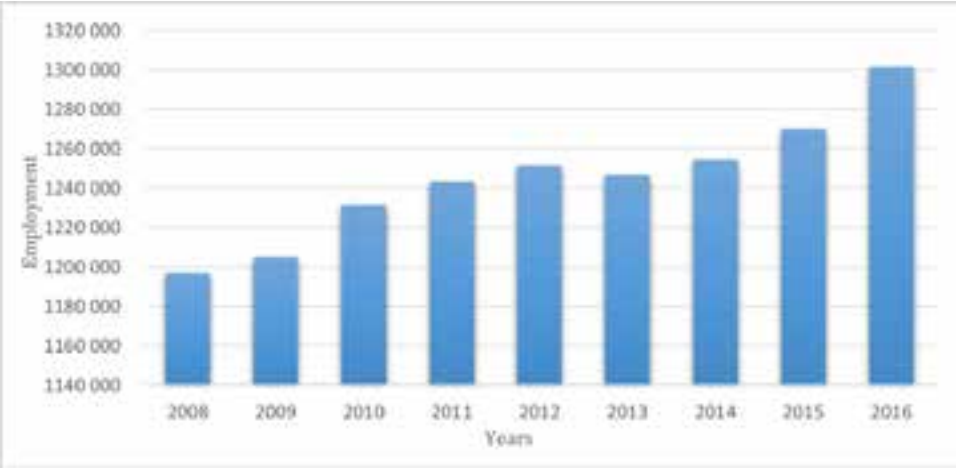


OECD – Total number of patents in the field of climate change mitigation technology development, the example of Slovenia (family size: one and greater)

10 OECD
11 OECD

Trends in abundance, temporal occurrence, and spatial distribution of non-indigenous species, particularly invasive, non-indigenous species, notably in risk areas
P3_INDXX
Definition: measuring the number and evolution of non-indigenous and invasive species
Unit: number
Measurement frequency: annual measure
Geographical coverage: sub regional area scale
Expected outcomes: clearly assess the situation, understand the potential relations with climate changes and anthropogenic pressures

Number of non-EU scientists who have access to European marine RIs
P4_INDXX
Definition: number of non-EU scientists who use European marine research facilities, laboratories, vessels or in situ platforms.
Unit: number
Measurement frequency: annual measure
Geographical coverage: measurement for each European marine RI
Expected outcomes: reinforce TNA access for non-EU scientists; facilitate their trips to EU facilities. This number is expected to increase.

Employment in tourism
P5_INDXX
Definition: measuring the socio-economic impacts of tourism. Tourism can be regarded as a social, cultural and economic phenomenon related to the movement of people outside their usual place of residence. An establishment in the tourism sector is an enterprise or part of an enterprise that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added. Data on employment in tourism refer to people or jobs[12].
Unit: number
Measurement frequency: annual measure
Geographical coverage: national, regional, coastal areas scale measurement.
Expected outcomes: the Mediterranean's unique features provide major local opportunities for blue growth and jobs, particularly regarding tourism industry. Bluemed aims at developing these opportunities and strengthening a sustainable and eco-friendly tourism. Therefore, employment value in tourism is expected to rise in the following years.
Limits/precautions for use: does not focus only on coastal tourism but on the overall tourism industry. Moreover, it encompasses all sort of jobs, not only those tending towards the development of a sustainable and eco-friendly tourism.
References/data sources: OECD
Trend:  OECD – Total tourism employment, the example of France

12 OECD

Proportion of bathing sites awarded the Blue Flag out of total coastal bathing sites
P5_IND
Definition: The eco-label Blue Flag qualifies sites, which meet and maintain a series of stringent environmental, educational, safety-related and access-related criteria. Improving coastal quality waters and reducing pollutions in the Mediterranean Sea could enable the augmentation of sites awarded the Blue Flag and promote a sustainable tourism that respects some key environmental standards.
Unit: percentage
Measurement frequency: annual measure
Geographical coverage: national, regional, coastal areas scale measurement.
Expected outcomes: increase this proportion in the following years, especially in countries of the southern shore of the Mediterranean, where the label is not very much used.
References/data sources: Blue Flag

Trend:

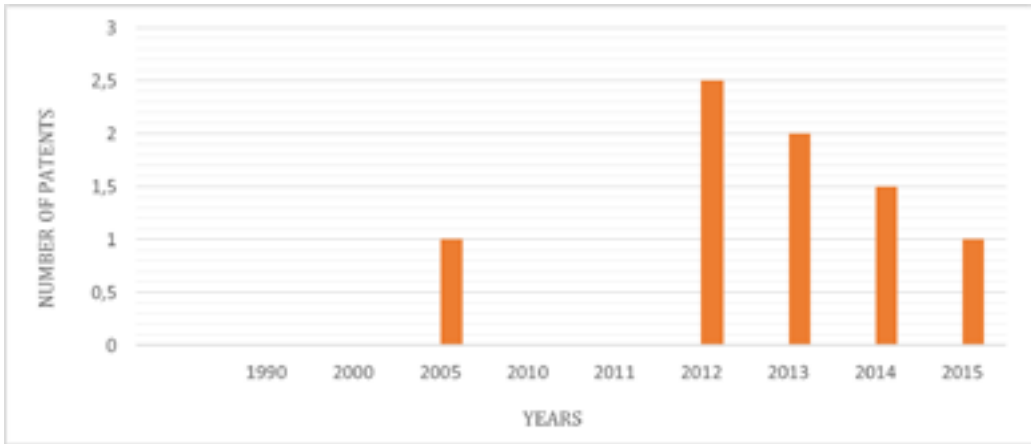
Blue Flag – Beaches awarded the Blue Flag label

Length of coastline subject to physical disturbance due to the influence of man-made structures
P6_IND
Definition: Mediterranean coastal areas are threatened by development that modifies the coastline through the construction of buildings and infrastructures that are needed to sustain residential, tourism, commercial, transport and other activities. Aims at measuring the length of artificial coastline and its share in total country's coastline.
Unit: km and percentage out of total coastline
Measurement frequency: annual measure
Geographical coverage: national and coastal scale measurement
Expected outcomes: assess the exact length of coastline subject to physical disturbance due to manmade structures in order to preserve the natural habitats and ecosystems.
References/sources: UNEP/MAP ECAP

Trend:

	LENGTH (KM) 2006			PERCENTAGE 2006		PERCENTAGE 2012		TREND 2006-2012
	total	natural	artificial	natural	artificial	natural	artificial	artificial
ITALY – continental	3844.985	3058.103	786.882	79.53	20.47	79.02	20.98	+0.51%
SICILIY	1177.769	1003.140	174.629	85.17	14.83	85.01	14.99	+0.16%
SARDINIA	1512.145	1444.395	67.749	95.52	4.48	95.46	4.54	+0.06%
TOTAL	6535.899	5505.638	1029.261	**84.25**	**15.75**	**83.89**	**16.11**	**+0.36%**

Length of built-up coastline in Italy in 2006 (EcAp-ICZM Italian Ministry of Environment/ISPRA)

Number of patents in the field of climate change mitigation technology related to maritime transportation
P7_IND
Definition: assesses countries' and firms' innovative performance as well as the design of governments' environmental and innovation policies[13] related to climate change mitigation and maritime/waterways transportation.
Unit: number (family size: one and greater).
Measurement frequency:
Geographical coverage:
Expected outcomes: increase this number
Limits/precautions for use: not all inventions or innovations are patented. Measuring the number of patents by itself does not provide information on their relative importance and impact.
References/data sources:
Trend:    Number of patents in the field of climate change mitigation technologies related to maritime transportation, the example of Spain.

13 OECD

Vessels operation pollution, in million tonnes
P7_IND
Definition: measures the operational pollution resulting of the discharge of wastes that have been produced on the boat. Operational pollution and commercial use of vessels (everything related to freight and passengers transport) = wastes dumping such as waste waters, garbage, dirty bilge waters, tank cleaning waters, and exhaust gas… Operational pollution from recreational boats = wastewaters and domestic wastes. Operational pollution from tankers = illegal oil discharges and ballast water[14].
Unit: million tonnes (Mt)
Measurement frequency: annual measure
Geographical coverage: National scale measurement
Expected outcomes: decrease this number in the following years
References/data sources: REMPEC

Annual mean of fuel consumption by ships over 5000GT
P7_IND
Definition: the International Maritime Organization (IMO) adopted a mandatory fuel consumption data collection. It requires ships above 5,000 gross tonnage to start collecting and reporting fuel consumption from the start of 2019. The aggregated data is reported to the flag State after the end of each calendar year and the flag State, having determined that the data has been reported in accordance with the requirements, issues a Statement of Compliance to the ship. Flag States are required to subsequently transfer this data to an IMO Ship Fuel Oil Consumption Database. IMO will be required to produce an annual report to MEPC, summarizing the data collected[15]. This regulation aims at determining precisely how much CO2 international shipping is responsible for before proposing policy decisions.
Unit: tonnes
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to decrease in the following years
Limits/precautions for use: the utilization of this data collection system for fuel oil consumption is brand new so quality and completeness of data is still uncertain. Moreover, only ships above 5000 gross tonnages are required to provide data.
References/data sources: IMO's data collection system for fuel oil consumption of ships (when available)

14 Plan Bleu
15 IMO

Annual mean concentration of fine particulate matter of less than 2.5 microns of diameter (PM2.5) in coastal urban areas
P7_IND
Definition: the annual mean concentration of fine suspended particles of less than 2.5 microns in diameters is a common measure of air pollution. The mean is a population-weighted average for urban population in a country[16].
Unit: Ug/m3 (at city levels)
Measurement frequency: annual measure
Geographical coverage: coastal cities of more than 10.000 inhabitants
Expected outcomes: this number is expected to decrease in the following years
Limits/precautions for use: quality of data differs according to countries (not the same amount of monitoring everywhere). There is a need to affine the WHO database before working on it (it presents all cities and not only coastal cities)
References/data sources: WHO

Number of firms active in blue biotechnology
P8_IND
Definition: measuring number of biotechnology firms, which are firms devoting at least 75% of their production of goods and services, or R&D, to biotechnology
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: increase this number
Limits/precautions for use: lack of data online on specific blue firms
References/data sources: OECD

R&D public investments for renewable energy
P9_IND
Definition: measuring investments made by governments to support the development of renewable energy.
Unit: euros
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: Invite governments to increase this value in the following years.
Limits/precautions for use: lack of data online. Does not focus only on marine renewable energy.
References/data sources: OECD/IEA
Number of national renewable energy incentives

16 WHO

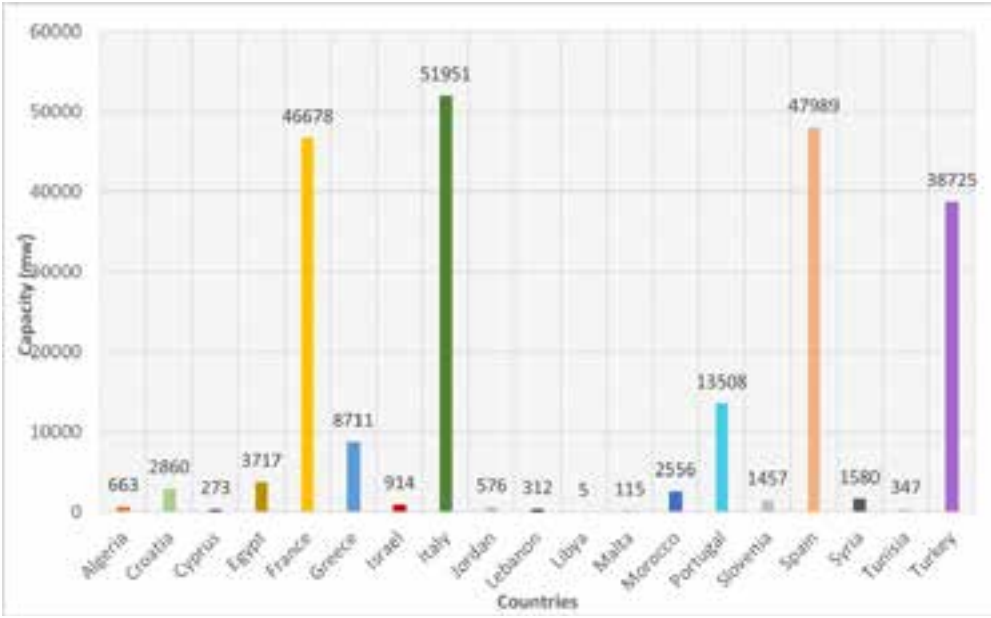
P9_IND
Definition: measuring incentives that are financial instruments, monetary benefits, implemented by governments to address barriers and support the development of renewable energy and energy efficiency technologies.
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: BlueMed aims at promoting the role of Marine Renewable Energies in the energy transition phase and wishes to develop the number of MRE farms and projects in the Mediterranean. This number is expected to rise.
Limits/precautions for use: does not focus only on marine renewable energy.
References/data sources: OECD/IEA

Number of scientific publications in the field of marine sciences in open access
P10_IND
Definition: measuring the total number of scientific papers related to marine sciences disciplines published every year in a given country.
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: increase in the following years
Limits/precautions for use: assesses the number of total publications related to marine sciences and not only those specific to Mediterranean Sea.

Share of fossil fuels in total primary energy supply
P9_IND
Definition: measuring the part of fossil fuels within the energy market. Fossil fuels include coal, oil shale, peat and peat products, oil and natural gas.
Unit: percentage
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: decrease this number in the following years
References/data sources: IEA/ OECD /BP Statistical Review of World Energy (June 2018)

Total renewable capacity energy, in MW
P9_IND
Definition: renewable power generation capacity is measured as the maximum net generating capacity of power plants and other installations that use renewable energy sources to produce electricity. For most countries and technologies, data reflect the capacity installed and connected at the end of the calendar year[17].
Unit: Megawatt (MW)
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: increase this number in the following years
Limits/precautions for use: takes into consideration all sources of renewable energies, not only MRE. For countries having several maritime coastlines, the indicator does not only focus on the Mediterranean.
References/data sources: BP Statistical Review of World Energy (June 2018) / IRENA / OECD

Trend:

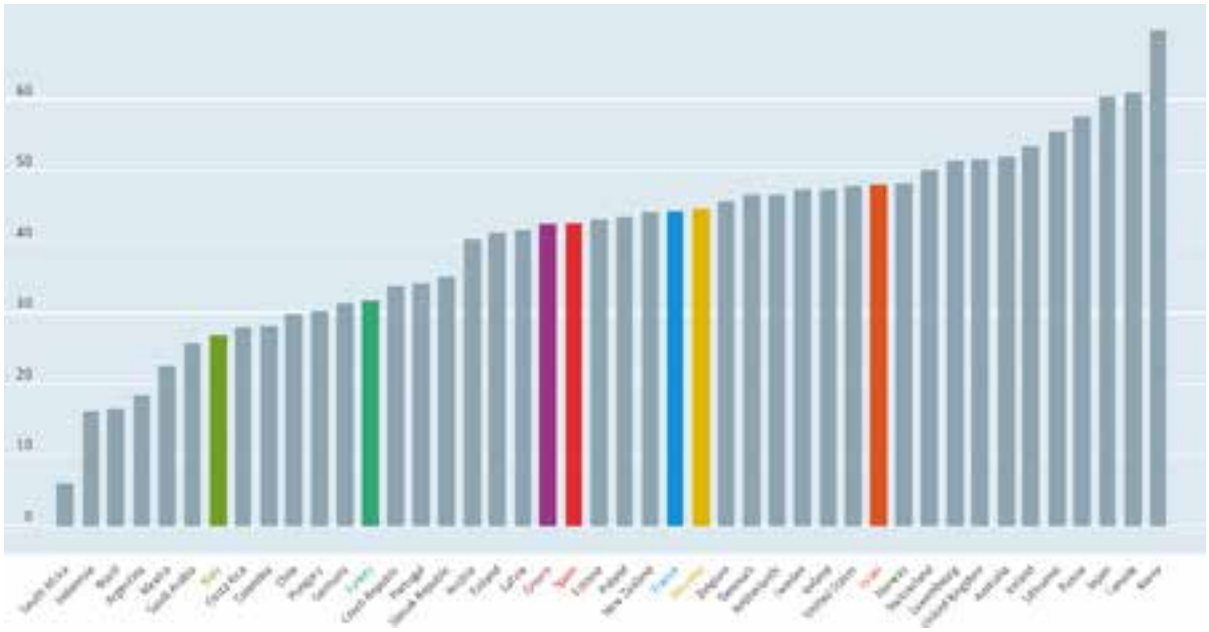


IRENA – Total renewable energy capacity in 2017

17 IRENA

Share of population with tertiary education
P11_IND
Definition: measuring the amount of people who completed the highest level of education, by age group. This includes both theoretical programmes leading to advanced research or high skill professions such as medicine and more vocational programmes leading to the labour market[18].
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to rise in the following years.
Limits/precautions for use: not directly linked to BlueMed actions. It rather aims at providing a general context. The measurement of population with tertiary education does not only focus on domains related to blue economy or marine sciences.
References/data sources: OECD

Trend:



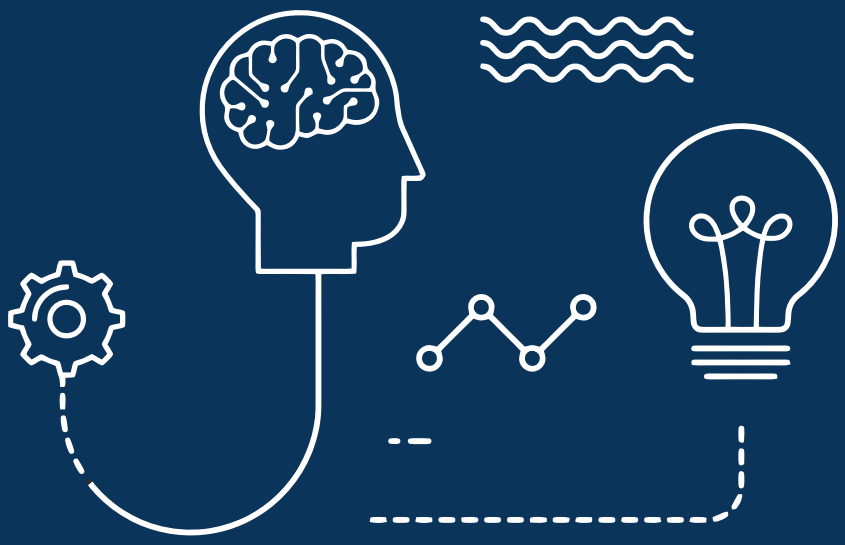
OECD – Population with tertiary education 25-34 years old in same age group, highlight on Italy, Turkey, Greece, Spain, France, Slovenia and Israel, 2017 or latest data available

18 OECD

Share of population holding a PhD in marine sciences
P11_IND
Definition: This indicator assesses the part of population holding a PhD in a discipline related to marine sciences in a given country.
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this percentage is expected to rise in the following years.
References/data sources: national registers

Number of universities delivering trainings in marine sciences
P11_IND
Definition: information on the number of universities involved in delivering marine sciences trainings.
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to rise in the following years.
References/data sources: national registers

Total number of Master degrees in marine sciences
P11_IND
Definition: information on the number of marine sciences advanced degrees delivered by universities of a given country.
Unit: number
Measurement frequency: annual measure
Geographical coverage: national scale measurement
Expected outcomes: this number is expected to rise in the following years.
References/data sources: national registers



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