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Towards a Sustainable Blue Economy in the Mediterranean region

2021 Edition



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Disclaimer

This publication collects qualitative/quantitative information on the current status and potential of the blue sectors in the UfM region with a particular focus on the Mediterranean countries.

The information and views set out in this publication do not necessarily reflect the official opinion of the Union for the Mediterranean and donors involved, which are not responsible for any use that may be made of the information contained therein.

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INTRODUCTION AND CONTEXT

In February 2021, Ministers from the 42 Union for the Mediterranean (UfM) countries have agreed to intensify their efforts towards a sustainable blue economy in the Mediterranean.

In the aftermath of one of the biggest crises that has affected the region and beyond since the WWII, it is clear that the blue economy must now address a number of serious challenges, but it also has the full potentials for offering a resilient source of growth and jobs across the Mediterranean region.

Opportunities for sustainable innovations are evident for green shipping, sustainable aquaculture and fisheries, as well as maritime and coastal tourism in the region – all activities that provided a strong source of growth and particularly jobs in the past and can still play a pivotal role in the future of the region,

if capable of fully embracing available new technologies, news innovative business models or manage the shift from global to more local. Emerging niches in areas, such as renewable marine energy, blue biotechnologies as well as marine safety and security, have instead the potentials to develop through time into rich and diversified economic business ecosystems.

For the sector to be able to address the current challenges and fulfil its full potentials in the mid-term, nevertheless, a number of cross-cutting areas should be fully addressed including through the active and coordinated support of policymakers in the region.

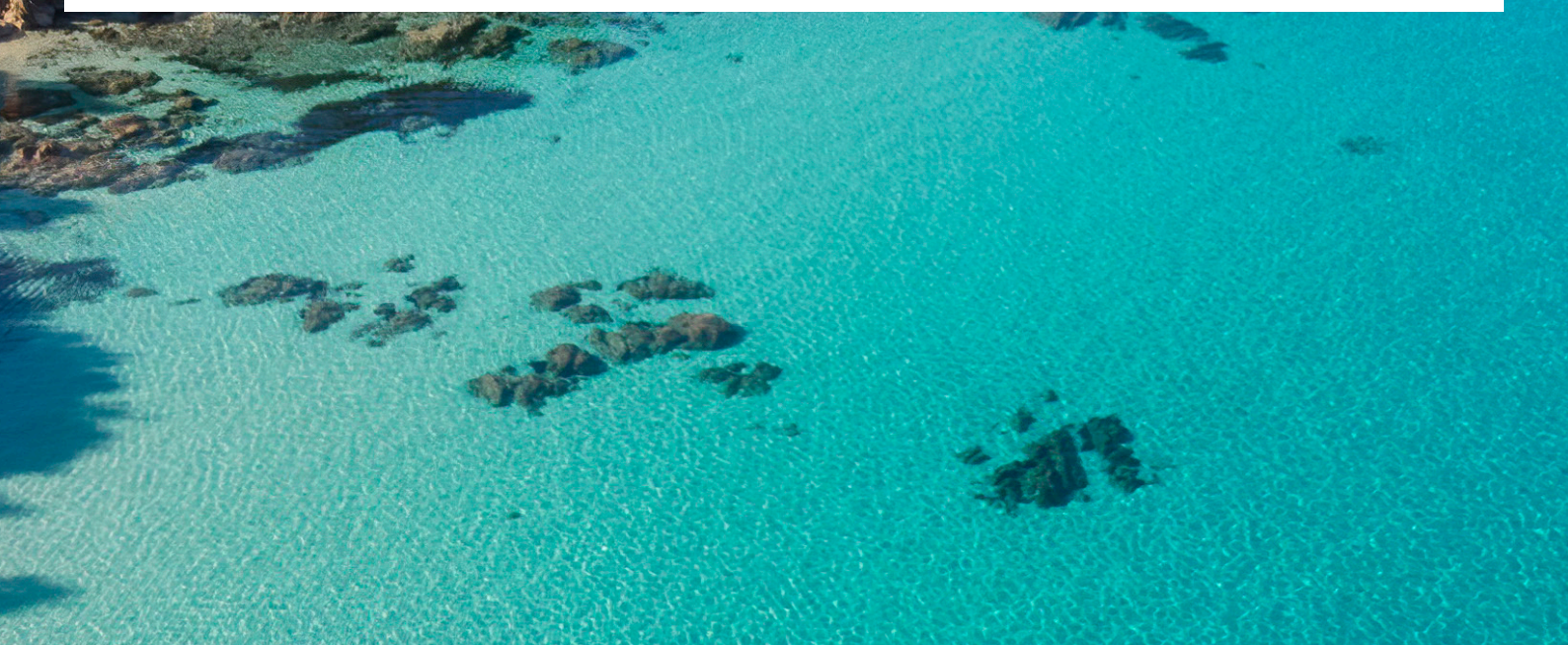
Avoiding marine litter and pollution, fostering marine and maritime research and innovation, providing the right incentives for striving blue skills, careers and overall employment are all pivotal activities which would enable a sustainable growth for regional blue economy economic activities.

Importantly, sustainable investments must be mobilised across the blue economy activities, both mature and embryonic, and a strong governance should be ensured across the region, including through – but not limited to – a strong role of sea basin strategies in the future.

This 'Blue Economy in the Mediterranean Report' provides an updated overview and projection of the potential of the blue economy in the region, including an analysis of each of the blue economy sectors, based on the most recent available data and sources, and it also includes identified trends in the creation of job opportunities and skills development.

Topics include the governance and the future of sea basin strategies in the Mediterranean region; the status of marine and maritime research and innovation, skills, careers and employment; interactions between marine litter and the sustainable blue economy and sustainable investments in the blue economy.

At the same time, the following maritime sectors of particular interest in the Mediterranean are also introduced, which include fishing and aquaculture, coastal and marine tourism, maritime transport and ports (including shipbuilding), marine renewable energy and maritime safety and security.



Blue Economy

Sectors in the

Mediterranean Sea



FISHERIES AND AQUACULTURE



INTRODUCTION

Fisheries and aquaculture are essential drivers for the blue economy in the Mediterranean. They provide essential coastal livelihoods as well as often substantial access to food, as part of the “Mediterranean diet”.

Despite the relatively low economic output of fisheries and aquaculture compared to other economic activities in the region (e.g. tourism, oil and gas exploration), the annual production offers employment opportunities to several hundred thousand people.

Fisheries and aquaculture supply seafood products for human consumption to a mix of local, regional and international markets, also creating many other indirect benefits and thereby maintaining the social fabric of many coastal communities.

Numerous factors threaten the sustainability of Mediterranean fisheries and aquaculture, including increased pollution from human activities, habitat degradation, the introduction of non-indigenous species, overfishing and the impacts of climate-driven changes on the marine environment and its ecosystems.

To address the challenges, most of Mediterranean countries¹ endorsed in 2017 the MedFish4Ever Declaration and have been reinforcing efforts in key priorities:

- protection of marine resources,
- combating Illegal, Unreported and Unregulated (IUU) fishing,
- strengthening the viability of coastal communities through the support to the small-scale fisheries prevailing in the region,
- ensuring decent working conditions and social protection of fishers, making fisheries more attractive to young generations,
- giving equal recognition of the work of women as well as building sustainable aquaculture and strengthening the value chain.

Mediterranean demand for fishery products has been rising steadily during the last decades. This can be attributed to an important population growth and an increase in human consumption per capita. Despite this, the sector's production has been decreasing in the most recent years.



¹ It was signed by 16 countries (Albania, Algeria, Bosnia and Herzegovina, Croatia, Cyprus, France, Greece, Italy, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Tunisia and Turkey) as well as the European Commission

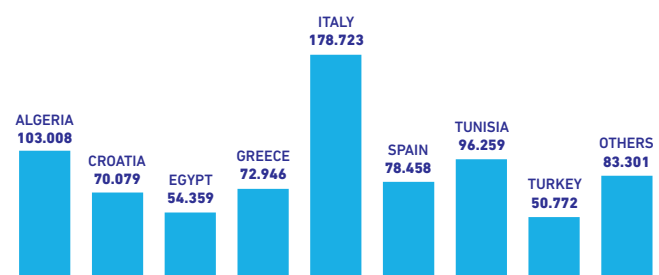
OVERVIEW

Fisheries

The Mediterranean's total landings of over 800,000 tonnes between 2014 and 2016 was in fact lower than the combined landings over the 2000–2013 period (–17%).

A fishing stocks decline has been noticed, due to the realisation of negative effects of past practices, such as fish stocks overexploitation, coupled with increasing effects of pollution and climate change – including invasive non-indigenous species (NIS) – which have a direct impact on the marine ecosystem (FAO 2018).²

Figure 1 Annual landing (tonnes)



Source: Average annual landings of GFCM contracting parties, cooperating non-contracting parties, (FAO 2020)

Thus, although the sector is traditionally a relevant economic sector (about EUR 3.4 billion in 2018), Mediterranean countries are facing an important and growing seafood supply deficit. This is having an impact on employability in the sector – also due to increasingly stringent regional commitments.³

Such dynamics differ across type of species, with small pelagic species showing large and frequent fluctuations in the past, and a steadily decline in most recent years. Demersal species have also shown continuous declines in catch since the 1980s–1990s. On the contrary, mullets, molluscs (common cuttlefish, rapa whelk) and most of crustacean species (spottail mantis shrimp, deep-water rose shrimp, blue and red shrimp, and giant red shrimp), show an increasing trend of catch.⁴

This said, it is important to note that even with an overall decrease in landings, revenue from Mediterranean fishing has increased of about 10% in 2018, with the overall revenue from 2013 to 2018 fluctuating between EUR 3.2 and 3.7 billion. In this respect, six countries, namely Italy, Greece, Turkey, Spain, Algeria and Tunisia, account for 83% of total revenue.

Nevertheless, only six countries (Morocco, Tunisia, Turkey, Albania, Croatia and Greece) are net exporters while the majority of Mediterranean country rely heavily on seafood import.⁵

Fisheries remain important operations for the regions, with a large portion of such vessels operating in the eastern and central Mediterranean. Small-scale vessels represent the predominant fleet segment – contributing to 29% of the total sector's revenues in 2018.^{6–7}

By endorsing the Malta MedFish4Ever Ministerial Declaration⁸, signed in March 2017, most of the Mediterranean countries agreed on the importance of Small-scale fisheries (SSF). This is not simply because they make up a significant portion of the fleet, but also because of their relevance in fostering social and economic results (i.e. job and revenue creation at the local communities' level).

SSF provide important jobs and food security precisely where they are needed most: to vulnerable populations, particularly in rural coastal communities. Coupled with efforts to improve the profitability of the SSF sector, there is also a need to promote the sector's social development, addressing vulnerabilities and removing barriers that may prevent fishers from escaping the poverty cycle.

These developments have caused a growing pressure on Mediterranean fish stocks, most of which are currently being fished at biologically unsustainable levels.

A positive reaction to such negative trend has been the growing rate of awareness on the risks of overexploitation in recent years. This has been thanks to the improvements in management by the authorities, including a wide variety of measures concerning minimum landing size, catch limits, ad hoc spatial and temporal closures to allow for the recovery of stocks and the creation of refugia zones, reductions of the fishing effort, etc.

² The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2018) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

³ The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

⁴ The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2018) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

⁵ The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

⁶ The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2018) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

⁷ The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

⁸ Ministerial declaration on the sustainability of Mediterranean fisheries Available at: <https://gfcmsitestorage.blob.core.windows.net/website/MedFish4Ever/2017-03-30-declaration-malta.pdf>

Nevertheless, in 2017, the Mediterranean and Black Sea still had the highest percentage (62.5%) of stocks fished at unsustainable levels in the world.⁹

As stated by GFCM in its last state for Mediterranean and Black Sea Fisheries 2020,¹⁰ additional efforts are still required to enhance fisheries management to fight IUU fishing but also to reduce discards (230,000 tonnes per year, or around 18% of the total catch).

In recent years, for example, sea turtles have represented the highest share of total reported incidental catch of vulnerable species, followed by sharks and rays. Understanding by-catch, and adopting effective measures to reduce it, therefore represent essential steps towards minimising the impacts of fisheries on vulnerable species, discards, and more generally on marine ecosystems.¹¹

Monitoring programmes on the incidental catch of vulnerable species have been launched to develop and implement appropriate conservation and management measures for the protection of vulnerable species. They engage resident populations in the Mediterranean and contribute to the concomitant sustainability of the fisheries sector.¹²

To confirm the demonstration of sustainable fisheries, the improvement of product traceability or the setup of ecolabelling will be helpful to develop public awareness on the fishing practices and the management of the resources. They will indeed allow the consumers to make informed decisions before buying any fish.

Aquaculture

An important trend emerging in the recent years is the increasing diversification of activities towards aquaculture practices – as a way to address the decrease in fisheries performance.

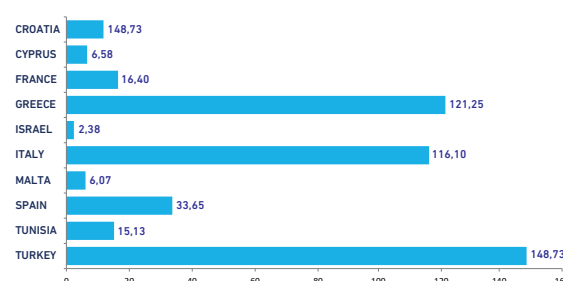
In this respect, several Mediterranean countries have already defined national strategies or action plans to develop the marine aquaculture with dedicated frames or as part of their national strategies for a sustainable blue economy – including pledges for sustainable aquaculture practices.¹³

As a consequence, the total aquaculture production for the Mediterranean countries (comprising fish, shellfish and crustaceans farmed in marine, brackish waters) has increased from 643 thousand tonnes in 2000 to 1,144 thousand in 2010, continuing up to 1,575 thousand tonnes in 2016 and remaining substantially stable in the following years.¹⁴⁻¹⁵

The bulk of production (around 1 million tonnes) takes place in brackish inland waters in Egypt for tilapia, cyprinids and mullets. Excluding inland waters fish production, aquaculture in marine and brackish waters reached a total production of more than 480,000 tonnes in 2016.¹⁶

Four countries account for approximately 82% of the total aquaculture value in the Mediterranean: Turkey has the highest value about US\$ 670 million, followed by Greece, Italy and Spain.

Figure 2 Annual Aquaculture Production (tonnes)



Source: Annual aquaculture production (thousands tonnes) in the Mediterranean by producer (FAO FISHSTAT, 2018)

Sales volumes amounted to 373,000 metric tons and 1,300 million juveniles, valued at EUR 1,500-1,700 million in 2016.¹⁷

As far as shellfish are concerned, total production was 190,391 tonnes in 2000 and decreased to 147,101 tonnes in 2010: it then remained largely stable until 2016, reaching 146,051 tonnes (FAO 2018).

The decrease in production (-23% from 2000) mainly related to the loss of space suitable for shellfish farming, along with important changes in Mediterranean coastal waters on the level of nutrient availability, extreme events, marine pollution and bio toxins.

9 The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

10 The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2020) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

11 The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

12 The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2020) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

13 EC article on GFCM High-level meeting in November 2020 Available at: https://ec.europa.eu/fisheries/press/gfcm-high-level-meeting-building-new-strategy-mediterranean-and-black-sea-fisheries-and_en

14 FAO (2018). Fisheries and aquaculture software. FishStatJ - software for fishery statistical time series

15 State and trends of EU and global fisheries and aquaculture (JRC 2020) Available at: <https://ec.europa.eu/jrc/en/science-update/state-and-trends-eu-and-global-fisheries-and-aquaculture>

16 PHAROS4MPAs project. Available at: https://pharos4mpas.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/Projects/PHAROS4MPAs/AQUACULTURE_31july_single_page.pdf

17 MEDAID project. Available at: <http://www.medaaid-h2020.eu/index.php/2019/10/08/deliverable-d1-3/>

Most of these changes were due to human pressures and climate change. In this respect, the challenge for the sector is to support innovation and sustainable diversification – from fisheries to aquaculture, from food to high-value production.¹⁸

Offshore aquaculture production has looked increasingly attractive in recent years, particularly as a way to avoid challenges posed by coastal issues: water quality, diseases, local environmental impacts and limits to supply growth faced by conventional coastal producers.

If proper regional planning approaches and governance frameworks are adopted,¹⁹ the environmental advantages of offshore production can offer improvements over traditional coastal producers in bays or estuaries.

Nevertheless, the economic business case of such technology is still unproven, and substantial risks to offshore production remain as the technologies develop and scale. A range of promising practices towards sustainable aquaculture small-scale practices are nevertheless arising.

BOX 1 Better Management Practice in Aquaculture Allocated zones for Aquaculture

In the Mediterranean, the future development of aquaculture is highly dependent on the availability of space to develop this activity in a sustainable way. Allocated Zones for Aquaculture (AZAs), defined as “marine areas where the development of aquaculture has priority over other uses”, are considered an essential instrument towards this goal.

Managed through participatory marine spatial planning, AZAs contribute to local economic development by encouraging investments and creation of SMEs; enhance food security and social acceptability of aquaculture; reduce environmental impacts and strengthen local institutional capacity.

Combined with integrated multi-trophic aquaculture (IMTA) practices, AZAs may provide additional circular economy benefits.

¹⁸ Strategy for the sustainable development of Mediterranean and Black Sea aquaculture (GCM 2018). Available at: <http://www.fao.org/3/I9766EN/i9766en.pdf>

¹⁹ Porporato EMD, Pastres R and Brigolin D (2020) Site Suitability for Finfish Marine Aquaculture in the Central Mediterranean Sea. *Front. Mar. Sci.* 6:772 Available at: <https://www.frontiersin.org/articles/10.3389/fmars.2019.00772/full>

COVID 19

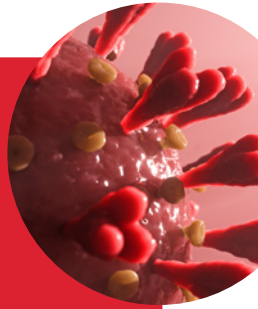
The sector as a whole was severely hit by the COVID-19 effects, with reductions of up to 80% in the number of operating vessels, particularly small-scale/coastal (with less than 10% still operating in some cases), while large-scale vessels often operated (40–100% depending on the cases).

In fact, the impacts of the COVID crisis were mainly on the supply chain and the commercialisation of the production. Cases where the production largely focuses on local markets may paradoxically find commercial niches and ways for sustainable growth.²⁰

Aquaculture farms had been very diversely impacted, largely depending on the type of species reared. Finfish farms, which generally require daily distribution of food, environmental monitoring and pathology control, remained active but with a reduction in the number of their employees, whereas farms rearing other species requiring less regular maintenance decreased their activity.²¹

BOX 2

COVID-19 IMPACT



- ▶ Both sectors have been strongly affected
- ▶ Fishing has been severely hit, with reductions of up to 80% in the number of operating vessels
- ▶ Aquaculture farms had very diverse impacts, largely depending on the type of species reared
- ▶ Drastic decline in demand for fishery products by hotels, restaurants and tourism industry at large

FUTURE (2021-2030)

Mediterranean countries have set forth their intent to improve the economic and environmental sustainability of the sector over the next decade.

Notably, through a series of ambitious targets and activities towards strengthening fisheries management and governance,²² but also by adapting the production process (i.e. reduction of by-catching) thanks to technical innovations.

In line with the Medfish4ever Declaration and the EU Farm to Fork Strategy,²³ more work in the future is needed to ensure adequate monitoring of the catch from these vessels.

In terms of fishery management measures, significant advances have been made by the GFCM in terms of managing fisheries resources.²⁴

The continuation to set management plan for commercial species is to continue for key Mediterranean stocks by including a wide variety of management measures, such as minimum landing size, catch limits, ad hoc spatial and temporal closures to allow for the recovery of stocks and the creation of refuge zones, reductions of the fishing effort, etc.

Important steps will also continue to be taken towards the spatial management of fisheries resources. Examples of these important steps include the launch of monitoring plans for Fisheries Restricted Areas (FRA), the determination of the fishing footprint of certain fisheries, the identification of Vulnerable Marine Ecosystems (VMEs) and VME indicator species hotspots as well as the collation of existing data into an analytical and dynamic database on sensitive benthic habitats and species.

²⁰ The State of World Fisheries and aquaculture (FAO 2020) Available at: <http://www.fao.org/3/ca9229en/ca9229en.pdf>

²¹ Fisheries and aquaculture in the Mediterranean and Black Sea: a preliminary Analysis of the impacts of the Covid-19 crisis Available at: <http://www.fao.org/3/ca9090en/CA9090EN.pdf>

²² Ministerial declaration on the sustainability of Mediterranean fisheries Available at: <https://gfcmsitestorage.blob.core.windows.net/website/MedFish4Ever/2017-03-30-declaration-malta.pdf>

²³ Ministerial declaration on the sustainability of Mediterranean fisheries Available at: <https://gfcmsitestorage.blob.core.windows.net/website/MedFish4Ever/2017-03-30-declaration-malta.pdf>

²⁴ Ministerial declaration on the sustainability of Mediterranean fisheries Available at: <https://gfcmsitestorage.blob.core.windows.net/website/MedFish4Ever/2017-03-30-declaration-malta.pdf>

In any case, additional efforts are still required to adequately achieve sustainability, especially in the face of a changing environment. Notably through improved dedicated adaptive management plans featuring socio-economic and climate change measures as well as additional spatial measures.

In addition with the existing actions mentioned above, all these efforts offer opportunities for greater cooperation between the Mediterranean countries to manage and protect the common good which is the sea and its living resources which are exploited by the fishers.

With regards to aquaculture, beyond this strong political will, the development of the sector is facing major socio-economic and environmental challenges.²⁵

Many factors may have contributed to this situation, resulting in a limited competitiveness that seems to be linked to multiple components throughout the production cycle and the value chain.

Doubts remain as to whether low zoo-technical productivity is caused by a lack of genetically improved fish, poor feed performance, inadequate health management, or a combination of these and other environmental factors. The lack of market strategies and an insufficient knowledge of consumer preferences can also be questioned.

Most importantly, companies develop their business in a complex economic environment, which is in turn affected by extent to which producers can easily access to finance and regional markets.

All these factors, together with the increased competition for coastal uses, a low public perception of aquaculture and a complex administrative framework, constitute a major challenge for aquaculture development.

The rapid expansion of aquaculture in the Mediterranean has intensified the competition for the use of coastal zones. As such there is a pressing need to integrate aquaculture into marine spatial planning processes. Without coordinated spatial planning, it will be impossible to move towards sustainable development for the sector.

The diversification of the sector is increasingly considered to boost competitiveness and sustainability of the aquaculture activities, with mariculture including high added value creation (algae, biotechnologies), where research and innovation can be mobilised. Areas of improvement will also include the opportunities for greater incorporation of circular business models and practices along the sector's value chain.²⁶

These opportunities are also chances for cooperation between the countries for instance between the northern and southern sea shores of the WestMED sea basin. In this regard, a technical working group has just been launched under the WestMED Initiative. The COVID crisis impacts were in fact mainly on the supply chain and the commercialisation of the production as for fisheries, while production that increasingly focuses on local markets may find new niches and ways for sustainable growth.²⁷

25 Challenges Facing Marine Aquaculture in the EU-Mediterranean Available at: <https://www.eurekaselect.com/156893/chapter/challenges-facing-marine-aquaculture-in-the-eu-mediterranea>

26 Public hearing - Measures to improve sustainable aquaculture in the EU (European Parliament) Available at: www.europarl.europa.eu/committees/en/public-hearing-measures-to-improve-susta/product-details/20200204CHE06981

27 The State of World Fisheries and aquaculture (FAO 2020) Available at: <http://www.fao.org/3/ca9229en/ca9229en.pdf>

EMPLOYMENT

Trends

- ▶ Capture fisheries in the Mediterranean support approx 200,000 direct and 500,000 indirect jobs (with a relative stagnation since 2016)
- ▶ Across the region, the workforce is aging, with close to half of all crew members over the age of 40, while only 17% are under the age of 25.
- ▶ Further added value and jobs creation with mariculture (blue biotechnologies, algae)

Skills

- ▶ Technical and professional skills needed in sustainable aquaculture/mariculture, design & planning; circular economy implementation
- ▶ Greater skills needed for policymakers to establish effective coastal zones dedicated to aquaculture in the Mediterranean
- ▶ Overall know-how of small-scale businesses should be improved (including their ability to engage with sustainable investors interested in the sector)

Youth & Women

- ▶ Attractiveness for youth and women with a wide variety of full-time, part-time and seasonal employment along the value chain where synergies can be found, for instance with fisheries
- ▶ Women also play an important role in aquaculture, with their key contribution being in both small-scale and industrial fisheries at the processing and marketing stage

The sector is traditionally a significant employer in the Mediterranean, with about 200,000 direct jobs in 2018 – i.e. those directly employed on board fishing vessels in full-time and part-time roles. A stagnation of the workforce has been noticed since 2016.²⁸⁻²⁹

Additional non-vessel-based jobs have been estimated in the past to be possibly around 2.5 as much as direct ones – therefore making the sector a source for about Mediterranean 500,000 jobs.³⁰

Nevertheless, across the region, the workforce is aging, with close to half of all crew members over the age of 40, while only 17% are under the age of 25.

Although not always reported separately from the sector as large, employment in the aquaculture sector for the Mediterranean has been estimated at approximately 123,000 permanent jobs for 2005 to 2010.³¹⁻³²

Similarly to fisheries, aquaculture provides a wide variety of full-time, part-time and seasonal employment, whether in production units or in support activities, distribution or technical and administrative support.

Greater efforts will be needed to build a more resilient fisheries and aquaculture industry. For instance, through supporting young skilled researchers and business actors in the sectors as well as building resilience for future regional or global emergencies (including pandemics).³³

Female participation is essential for the sector but still remains largely unreported, hence often “invisible”. Women still rarely engage in commercial offshore and deep-sea waters, but are more commonly involved in fishing from small boats and canoes in coastal or inland waters, where they collect seaweed and set nets or traps. Women also play an important role in aquaculture, where they attend to fish ponds, feed and harvest fish and collect prawn larvae and fish fingerlings. However, their most important role in both small-scale and industrial fisheries is at the processing and marketing stages.³⁴

28 The state of the Mediterranean and Black Sea fisheries 2018 (FAO 2018) Available at: <http://www.fao.org/3/CA2702EN/ca2702en.pdf>

29 The state of the Mediterranean and Black Sea fisheries 2020 (FAO 2020) Available at: <http://www.fao.org/3/cb2429en/CB2429EN.pdf>

30 Ibid.

31 Literature regarding employment in aquaculture is often combined with fisheries and quoted in a variety of different ways.

32 Jacques SACCHI pour le Plan Bleu 2011 Analyse des activités économiques en Méditerranée Secteurs pêche et aquaculture

33 Fisheries and aquaculture in the Mediterranean and Black Sea: a preliminary Analysis of the impacts of the Covid-19 crisis (GFCM 2020) Available at: <http://www.fao.org/3/ca9090en/CA9090EN.pdf>

34 Study of the role of women in fisheries in the Mediterranean and Black Sea. Available at: <https://op.europa.eu/en/publication-detail/-/publication/02bea93e-3a43-11e9-8d04-01aa75ed71a1/language-en>

BOX 3 Actors, initiatives and projects related to Sustainable Fisheries and Aquaculture

- ▶ **FAO/GFCM:** With 22 member countries & the EU, its main objective is to ensure the conservation and the sustainable use of living marine resources as well as the sustainable development of aquaculture in the Mediterranean and in the Black Sea.
 - Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and Black Sea (RPOA-SSF),
 - Strategy for the Sustainable Development of Aquaculture.
- ▶ **WestMED Technical Group: Under the WestMED initiative,** the WestMED countries are to share best practices under the lead of Maghreb countries to develop sustainable aquaculture.
- ▶ **Blue Med Initiative:** Research and innovation for blue jobs and growth in the Mediterranean Area; BlueMed is supporting the shaping of partnerships composed by at least four entities from EU and non-EU countries to conduct multi-disciplinary meetings leading up to a feasibility or foresight study or a demonstration or pilot project e.g. **LabMAF:** Developing a Labelling Scheme for Mediterranean Small-scale and Artisanal Fish Products.
- ▶ **INTERREG MED BLUEfasma:** Empowering innovation capacity of SMEs and maritime networks in MED islands and coastal areas, to support blue circular economy growth in fishing/aquaculture.
- ▶ **MedAID** (Mediterranean Aquaculture Integrated Development) H2020 project. The goal of MedAID is to increase the overall competitiveness and sustainability of the Mediterranean marine fish-farming sector, throughout the whole value chain.

MARITIME TRANSPORT AND PORTS



INTRODUCTION

Covering about 80% of global trade, commercial shipping is essential for intra-Mediterranean maritime trade flows.³⁵

The sector represents one of the most prominent blue economy activities for the Mediterranean, but it is also exposed to market fluctuation and international crisis. Such characteristics make maritime transport a relatively volatile source of growth and jobs for the region, in a world increasingly exposed to disruptive shocks. Greening maritime transport is amongst the top challenges for the region.

Specifically, this concerns a drastic reduction of greenhouse gas emissions, air and water pollution as well as accidents and marine spills, noise, and overall impacts on coastal and marine biodiversity.

In order to address such challenges, the sector must accelerate the market-readiness for 'zero-emission' technologies, which in turns implies the mobilisation of significant investments in equipment and infrastructures across the sea basin.

Greater uptake of innovative technologies and full digitalisation are pivotal to foster smart ports, effective onshore power supply as well as the uptake of maritime single window systems across regional operators.



³⁵ <https://ufmsecretariat.org/impacts-covid-ports-maritime-transport-mediterranean/>

OVERVIEW

Global maritime transport has been growing at an average rate of about 3% to 3.5% in recent years (2005 to 2018), with a further increase towards 4% in 2019.³⁶

Representing just 3.5% of world water, the Mediterranean represents 27% of global maritime commercial traffic and hosts the largest cruise fleets.

The sea basin also hosts 10% of world cruises with almost 2.5 million travelers in 2018 and continuous expansion of maritime ports both in the north and south of the Mediterranean.³⁷

Differences persist in structures, characteristics and managerial specificities. Northern Mediterranean ports are integrated into the European hinterland through rail and road networks.³⁸

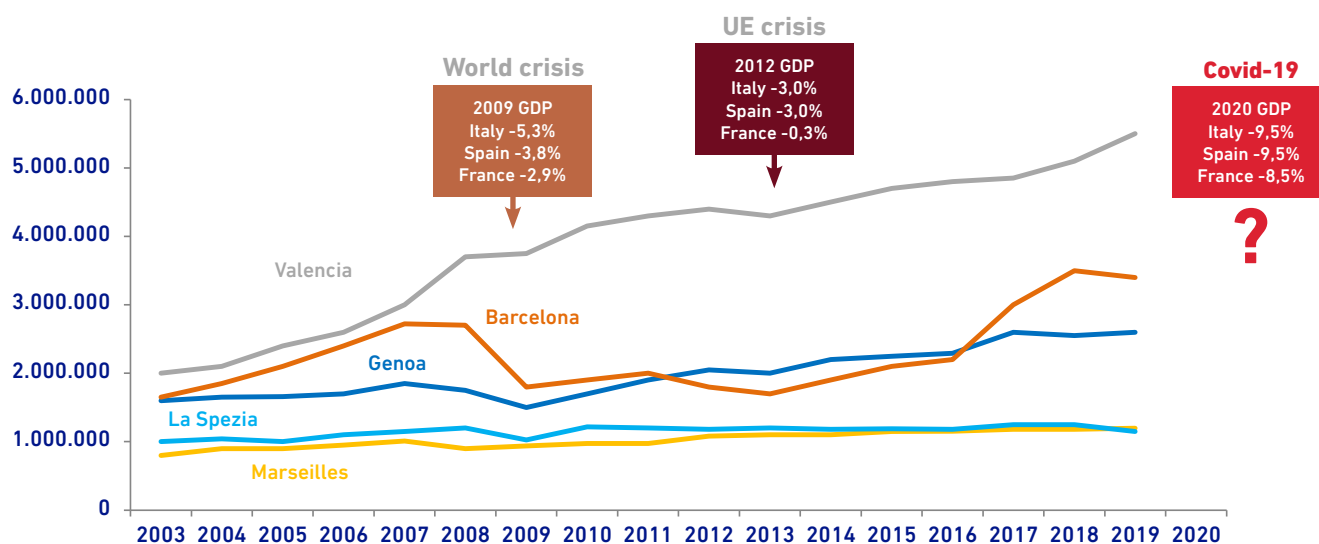
This is the case, for example, of Barcelona in Spain, Marseille in France, Genoa and La Spezia in Italy.³⁹

Northern African ports also have increasingly established themselves as essential nodes in an important shipping network, but often without being part of a broader inland multi-nodal logistic system as those in the EU counterparts.⁴⁰

Some of the leading exceptions in the southern Mediterranean region are Port Said in Egypt and Tangier Med in Morocco.⁴¹

Short-sea shipping has also represented a growing portion for shipping in the region, making for example the volume of good shipping in the Mediterranean the 31% of total EU short-sea shipping performance in 2018.⁴²

Figure 3: Containers Port Traffic Evolution (TEU)



Source: MedPorts Webinar 2020. Presentation: [THE PLANETARY PANDEMIC: FIRST MARITIME EFFECTS AND MEDITERRANEAN DIMENSION](#)

³⁶ UNCTAD (2019)

³⁷ <http://documents1.worldbank.org/curated/en/508771540319329808/pdf/131217-PUB-PUBLIC-publication-date-is-10-23-18.pdf>

³⁸ <https://ajot.com/premium/ajot-mediterranean-sea-ports-in-the-middle>

³⁹ Ibid.

⁴⁰ https://ec.europa.eu/transport/themes/infrastructure/ten-t_en

⁴¹ UNCTAD (2019) Review of Maritime Transport. https://unctad.org/system/files/official-document/rmt2019_en.pdf

⁴² <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/9639.pdf>

BOX 4 Ports around the Mediterranean

Port of Barcelona (Spain)	This is one of the largest ports in the Mediterranean and accounts directly or indirectly for 7.1% of the GVA and 6.3% of employment in the Catalonia region. ⁴³
Port of Genoa-Savona (Italy)	This is another major port in the Mediterranean. It produces economic benefits that extend outside the two port cities to a large part of the country. The impact of the port of Genoa alone has been estimated in 122,000 national jobs and a contribution of almost 10 billion euros to the Italian economy). ⁴⁴
Port of Marseille-Fos (France)	This is the first port in France and the third in the Mediterranean in terms of cargo tonnage. It generates 41,500 direct and indirect jobs, representing 7.5% of jobs in the commercial sectors. It has also scored a total of 97 out of 100 point in 2020 in the Gender Equality Index – suggesting a strong inclusion of women in the local workforce. ⁴⁵
Port of Tanger Med (Tunisia)	This is a leading container port in the Mediterranean – with a total of 5,771,221 TEU containers in 2020, marking a significant rise of +20% compared to 2019. Commercial vessels calls also increased in 2020, showing a 10% growth compared to 2019, coupled with +14% in megaships since 2019. ⁴⁶
Haifa port (Israel)	This port manages 50.3% of the cargo turnover of all Israeli ports and employs 1004 port workers. It is fourth in management efficiency amongst container-ports worldwide. ⁴⁷
Mersin International Port (Turkey)	This is the largest container port in Turkey and one of the major ports in the Mediterranean Sea – with a total of 2,009,724 TEU containers handled in 2020, an increase of 3.6% compared to the previous year. By 2022 the port is expected to gain 0.8 million TEU in capacity. The expansion will create 500 new direct jobs and 5,000 indirect gains in the city.

Shipbuilding

Shipbuilding is a vital element for the sector in the Mediterranean, especially in countries like France and Italy where highly specialised vessels are built (e.g. ferries, offshore vessels, and large cruise ships).⁴⁸

Shipbuilding, like other manufacturing activities, is influenced by a multitude of factors ranging from global trade, energy consumption and prices to changing cargo types and trade patterns, vessel age profiles, scrapping rates and replacement levels.

Shipbuilding capacity has exceeded due to market-distortive public support in some countries, as growth of the global fleet outstripped that of world seaborne trade by a considerable margin.⁴⁹

⁴³ <http://www.portdebarcelona.cat/en/web/economic/inici>

⁴⁴ <https://www.portsofgenoa.com/en/about-us/port-in-numbers.html>

⁴⁵ <https://www.marseille-port.fr/en>

⁴⁶ <https://www.tmpa.ma/wp-content/uploads/2021/01/Press-release-Final-figures-of-port-activity-at-31-12-2020.pdf>

⁴⁷ <https://www.haifaport.co.il/wp-content/uploads/2019/05/booklet-en.pdf>

⁴⁸ OECD (2020). Sustainable Ocean for All: Harnessing the Benefits of Sustainable Ocean Economies for Developing Countries. Available at: <https://doi.org/10.1787/bede6513-en>

⁴⁹ Gourdon, K. (2019). An analysis of market-distorting factors in shipbuilding. <https://dx.doi.org/10.1787/b39ade10-en>

Pressures

Importantly, the steady growth of the sector has accelerated the pressure on regional coastal and underwater ecosystems. Maritime transport and port activities have in fact reflected into anthropogenic pressure on the marine environment in the region. The sector is a responsible for air and water pollution and is a source of CO₂ emissions resulting in climate change.⁵⁰

Pressures on local ecosystems from maritime transport come in the form of potential chemical pollution from oil and Hazardous and Noxious Substances (HNS), dumping of garbage at sea, release of sewage, biofouling and non-indigenous species introduction.⁵¹

The correlation between traffic density and accidents causing pollution is confirmed by the oil spills recorded by The International Tanker Owners Pollution Federation Limited (ITOPF). In the Mediterranean, the “collision/contact” category accounts for 17% of accidents reported to REMPEC, after “grounding” (21%). The contribution of other accident types include fire/explosion (14%), cargo transfer failure (11%), sinking (9%), with other accidents amounting at 28%.⁵²

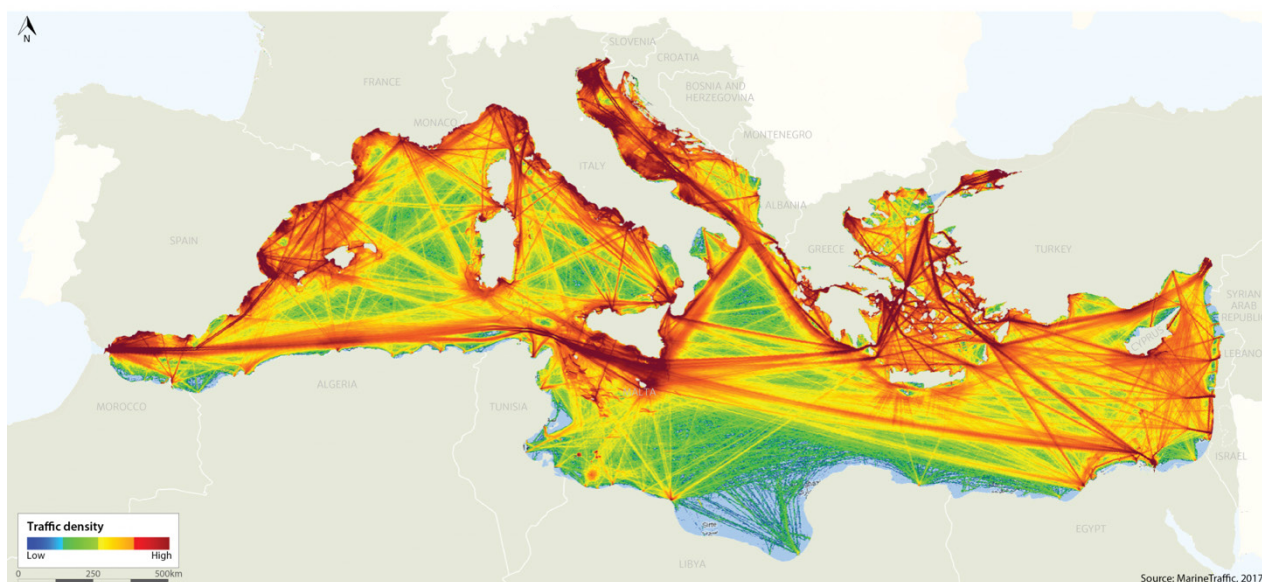
In addition, the greenhouse gas emissions and air pollutants resulting from the growth of the sector, have increasingly affected the quality of air and caused water pollution. In the EU alone, an increase in GHG emissions has occurred in the past decade despite improvements in the carbon intensity of international shipping.

Moreover, GHG emissions by maritime shipping are projected to increase from about 90% of 2008 emissions in 2018 to 90-130% of 2008 emissions, by 2050.⁵³

Air pollutants emitted from maritime shipping are to be addressed,⁵⁴ with increasingly stringent policy requirements which constitutes an environmental and technical challenge for shipping companies.

The Global Sulfur Cap 2020, adopted by the International Maritime Organization (IMO) 8 in October 2016, for example, currently limits sulfur oxide emissions to 0.5% in all the world's seas by January 2020 (IMO 628/5000). Current discussions for an emission control area for sulphur oxides in the Mediterranean may allow to open new possibilities for the region's future sustainable development.⁵⁵

Figure 4: Density of Maritime traffic



Source: density map image: <https://www.medqsr.org/background-ci19/>

Original data source: MarineTraffic website: <https://www.marinetraffic.com/en/ais/home/centerx:-12.0/centery:25.0/zoom:4>

⁵⁰ <https://www.medqsr.org/background-ci19>

⁵¹ <https://www.medqsr.org/background-ci19>

⁵² <https://www.medqsr.org/background-ci19>

⁵³ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/652754/IPOL_BRI\(2020\)652754_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/652754/IPOL_BRI(2020)652754_EN.pdf)

⁵⁴ https://ec.europa.eu/commission/presscorner/detail/en/IP_19_6837

⁵⁵ <https://www.euractiv.com/section/shipping/opinion/a-roadmap-to-cut-shipping-emissions-in-the-mediterranean/>

COVID 19

The recent and on-going global outbreak of the COVID-19 has had a major impact on global shipping. The sector is vulnerable to market fluctuations and international crisis, making it a relatively volatile source of growth and jobs in a world that is already increasingly exposed to shocks and fluctuations. As a consequence, global trade contractions related to the pandemic effects have been reportedly deeper (-27%) than the one following the 2008 financial crisis (-24%).⁵⁶

Europe and the Mediterranean saw the largest decline in calls across all global destinations, with a drop of 13.9% in the first 24 weeks of 2020, compared with the same period in 2019.⁵⁷

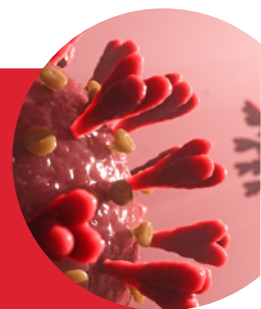
In EU ports alone, for example, the number of ships calls has declined by 12.5% in the first 48 weeks of 2020 compared to the same period in the previous year, with most significant impact seen on cruise and passenger ships (as discussed in other sections). Other activities such as bulk carriers, containerships, general cargo, oil tankers, and Ro-Ro cargo vessels had only a small decrease (up to 5%).⁵⁸

North African ports, instead, have shown mixed trends. In TangerMed, for example, connectivity levels largely coped well with the pandemic compared with other ports in the region, despite blank sailings negatively impacting service frequency.⁵⁹ Restrictions affecting inland transportation have created some challenges to cross-border crossings. For example, in some African countries, the time taken to pick up cargo after customs release increased in 2020 compared to the same period in 2019.⁶⁰

After years of steady growth,⁶¹ the crisis has also affected the performance of short-sea shipping.⁶² For example, with a decrease of 11% of operations in Spain⁶³ (although operators also shifted to short-sea shipping to counterbalance the crisis of long-haul transport). Similarly, the COVID-19 pandemic has already generated, and is expected to generate many more, effects on the shipbuilding industry and its broader value chains.⁶⁴

BOX 5

COVID-19 IMPACT



- ▶ Transport amongst the sectors hit hardest by COVID-19, with the most significant impact on cruise and passenger ships
- ▶ Global trade contracted by -27%; Ship calls in EU declined by 12.5% in the first 48 weeks.
- ▶ North African ports suffered from delays and frequency changes

⁵⁶ https://unctad.org/system/files/official-document/dtltlbinf2020d1_en.pdf

⁵⁷ https://unctad.org/system/files/official-document/dtltlbinf2020d1_en.pdf

⁵⁸ <http://emsa.europa.eu/newsroom/covid19-impact/item/4259-december-2020-covid-19-impact-on-shipping-report.html>

⁵⁹ <https://unctad.org/press-material/unctads-review-maritime-transport-2020-highlights-and-figures-africa>

⁶⁰ <https://unctad.org/press-material/unctads-review-maritime-transport-2020-highlights-and-figures-africa>

⁶¹ <https://www.itf-oecd.org/sites/default/files/docs/01shortsea.pdf>

⁶² <https://www.docksthefuture.eu/the-mediterranean-ports-connectivity-in-the-middle-of-a-vast-network-of-trade-lanes/>

⁶³ <https://www.portseurope.com/spain-registers-a-decrease-in-short-sea-traffic-in-first-half-2020/>

⁶⁴ <https://www.porttechnology.org/news/msc-offers-short-sea-services-to-counter-covid-19-disruptions/> <https://safety4sea.com/wilson-asa-arkon-shipping-to-enhance-eu-short-sea-shipping/>

FUTURE (2021-2030)

Global maritime trade is projected to recover and expand by 4.8% throughout 2021⁶⁵ – but scenarios are multiple and largely uncertain. Shipping trends are in fact driven by global trade activities that have been severely affected by the pandemic. The industry will therefore need to adapt to recover.⁶⁶

Importantly, the recovery will need to enhance as much as possible sustainability and resilience of the maritime transport sector as a whole, for sustaining jobs, international trade, and global economy.⁶⁷

The promotion of clean fuels and technologies is essential,⁶⁸ coupled with more stringent and effective means to measure the pollution emission impacts.⁶⁹

Ambitious developments are needed in order to effectively move towards zero emission ships and harbors, including through the support of sustainable energy mixes (LNG, methanol, hydrogen, biofuels, etc.) and the electrification of ships and ports. In this respect, for example, greater synergies between innovative logistics and energy infrastructures are essential for sustainable investments.⁷⁰

Importantly, for addressing the vulnerability of the regional market and the just-in-time model as emerged due to the crisis, it will be required to explore fully reliable supply-chains in the future.⁷¹ This will imply accelerating investment into technologies, particularly visibility and command and control-related technologies as well as assessments of vulnerabilities.

Companies will also need to spread risk more effectively, with clear back-ups plans to be put in place for relevant suppliers.⁷²

In this context, a strong focus should be put on the regionalisation of supply chains across the Mediterranean region, which has so far been highly dependent on global trends. Such regionalisation can be an efficient solution for both the southern and the northern shores of the Mediterranean.⁷³

A pivotal transformation to address future challenges faced by ports, is an increased pressure to become 'smart' by fully embracing a digital transformation. By becoming important nodes in the global supply chain, smart ports have the potentials to boost logistics information serving as hubs for the regional transport ecosystem in the Mediterranean.⁷⁴

By digitalising their processes and systems, Mediterranean ports may provide further benefits in regional cargo, freight and passenger business ecosystems. In turn, data will be generated along with new services and many new opportunities. But new technologies will also be essential to assure smart surveillance and monitoring tools for maritime transport, so to manage the risks of pollution and ecosystem disaster caused by spills.⁷⁵

In this context, fully operational maritime single windows services across Mediterranean ports would enable all information required by public authorities in connection with ship arrival, stay and departure.⁷⁶ But ports may also become essential sustainable energy hubs, by embracing concepts such as renewable energy communities, as promoted by the EU Green Deal.⁷⁷

Similarly, in order to develop new vessel concepts (flexible, modular and high efficiency ships), an essential challenge that is to be embraced by shipbuilders and shipping operators is that of using new sustainable materials through advanced design and production techniques. Fully circular models should be fostered in the region, so to adopt standard practices in shipping and port construction, installation, dismantling and recycling which reflect a circular economy business model for maritime transport.⁷⁸

To address and sustain such challenges, a number of initiatives are already in place, but further support is to be provided by policymakers and economic actors in the sector across the Mediterranean.

65 https://unctad.org/system/files/official-document/rmt2020_en.pdf

66 OECD (2020). Sustainable Ocean for All: Harnessing the Benefits of Sustainable Ocean Economies for Developing Countries. Available at: <https://doi.org/10.1787/bede6513-en>

67 <https://ufmsecretariat.org/impacts-covid-ports-maritime-transport-mediterranean/>

68 <https://www.euractiv.com/section/shipping/opinion/a-roadmap-to-cut-shipping-emissions-in-the-mediterranean/>

69 <https://portals.iucn.org/library/sites/library/files/documents/2009-062.pdf>

70 <https://medblueeconomyplatform.org/theme-2-sustainable-maritime-transport-and-ports/>

71 <https://www.cetmo.org/mediterranean-sea-covid-globalisation/>

72 <https://www.reutersevents.com/supplychain/supply-chain/end-just-time>

73 <https://www.cetmo.org/mediterranean-sea-covid-globalisation/>

74 <https://www.offshore-energy.biz/smart-ports-on-the-move-to-become-global-logistics-information-exchange-hubs/>

75 <https://www.medqsr.org/background-ci19>

76 <https://medblueeconomyplatform.org/theme-2-sustainable-maritime-transport-and-ports/>

77 https://ec.europa.eu/info/sites/info/files/research_and_innovation/green_deal/gdc_stakeholder_engagement_topic_05-1_green_airports_and_ports.pdf

78 <https://medblueeconomyplatform.org/theme-2-sustainable-maritime-transport-and-ports/>

The Union for the Mediterranean Declarations on Transport (2013) and the Blue Economy (2021) call for a sustainable, climate-neutral and zero-pollution maritime transport and ports.

Inter alia, they stress the importance for all UfM member countries to: comply with the 0.50% sulphur limit in marine fuels and call upon all riparian UfM member countries to ratify the Annex VI to the MARPOL Convention; support the timely preparation of the Med SOx ECA, to enter into force as soon as possible following the Roadmap proposed by the Barcelona Convention; promote the transition of the Mediterranean fleets and ports towards carbon-neutrality and zero pollution; call on Mediterranean countries to ratify the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships.⁷⁹

The Regional Strategy for Prevention of and Response to Marine Pollution from Ships (REMPEC) was adopted by the Contracting Parties to the Barcelona Convention in 2016, under the umbrella of the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC). It is managed by the International Maritime Organization (IMO) in cooperation with the Mediterranean Action Plan of the United Nations Environment Programme (UNEP/MAP). The overall goals of the Regional Strategy (2016-2021) are: first, to prevent pollution from ships; second to prevent maritime accidents; and third to prepare for response to major pollution incidents. Contracting parties requested to submit a draft follow-up strategy in spring 2021.⁸⁰

The Strategic Plan 2018-2022 of the Centre for Transportation Studies for the Western Mediterranean (CETMO) aims to improve transport conditions in the Mediterranean region to facilitate trade and the safe, efficient and sustainable movement of people, particularly in view of environmental protection with the overarching goal of promoting the socio-economic development of the region.

The Strategic Plan identified 7 strategic areas for the future, namely:

1. Observatory for the regional multimodal network;
2. Rail trade flows;
3. Maritime flows and nodes;
4. Road transport optimization and safety;
5. Transport facilitation;
6. Logistics centers; and
7. Transport sustainability⁸¹

The EU Strategy for the Adriatic and Ionian Region (EUSAIR) is a multi-regional strategy adopted by the European Commission and approved by the European Council in 2014. The Strategy was developed in collaboration between the Commission, representatives of the countries and the stakeholders of the Adriatic-Ionian region.

An agreement was reached to work in concert in areas of common interest to benefit both the individual countries and the region as a whole.

Pillar 2 of the strategy focuses on connecting the region. It aims to develop reliable transport networks and intermodal connections with the hinterland, both for freight and passengers. It also aims to strengthen maritime safety and security as well as to develop a competitive regional intermodal port system. The pillar 2 is coordinated by Italy, North Macedonia and Serbia.⁸²

By establishing a framework for cooperation in the western Mediterranean, the WestMED initiative's Technical Group on Sustainable Transport and Green Shipping is designed to foster dialogue among key stakeholders and contribute to the introduction of innovative solutions for clean maritime transport.

Following the conclusions of the Rabat Steering Committee in October 2019, the WestMED Assistance Mechanism established the above-mentioned Technical Group (TG) to address environmental challenges of maritime transport and identify potential avenues for its sustainable development, including funding and project development. The TG began its work in April 2020, and has since then held four meetings together with relevant stakeholders, port authorities and ministries from each WestMED country.

Dedicated National Groups have been established in all countries to support discussions at each TG meeting, with a wider group of national stakeholders being involved in consultation under the coordination of the WestMED National Hubs. A specific action plan, including a number of potential project ideas, is currently prepared. In parallel, a review is being conducted of the most appropriate funding mechanisms to support this type of approach.⁸³

⁷⁹ <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

⁸⁰ <https://www.rempec.org/en/about-us/strategies-and-actions-plans/regional-strategy>

⁸¹ [https://www.cetmo.org/sites/default/files/2.3_Strategic_plan_\(bo\).pdf](https://www.cetmo.org/sites/default/files/2.3_Strategic_plan_(bo).pdf)

⁸² <https://www.adriatic-ionic.eu/about-eusair/>

⁸³ <https://www.westmed-initiative.eu/promoting-sustainable-transport-in-the-western-mediterranean/?lang=fr>

BOX 6 Mediterranean Port Initiatives

YEPMED	Youth Employment in Ports of the Mediterranean (YEP MED), with a total budget of 2.9 million € works in six Mediterranean countries (Italy, Lebanon, Egypt, Tunisia, France and Jordan) to promote social inclusion and the fight against poverty in the region through the professionalisation of young people.
PSAMIDES	PSAMIDES is a European Territorial Cooperation project funded under the Interreg MED Programme, with the objective to up-scale and capitalise on existing innovative solutions for a more efficient, sustainable ports ecosystem. To do so, it promotes collaboration between stakeholders of the ports ecosystem in 5 euro-Mediterranean countries. Its budget amounts to 2.9 million €.
DocksThe Future	DocksTheFuture project aims to define the “Port of the Future”, understood as a port capable of facing challenges related to process simplification and digitalization, dredging, emission reduction and energy transition, among others. Based on an academic partnership, the project is currently refining the Port of the Future targets in 2030 and gathering potential projects to be clustered, as well as appropriate KPIs leading to the “Port of the Future Road Map for 2030”.
LIFE4MEDECA	LIFE4MEDECA aims to build consensus and awareness about the creation of an Emission Control Area (ECA) in the Mediterranean. Among its key activities, the project develops technical and economic studies on the impact of maritime transport, with input from stakeholder dialogues in the four countries involved (Germany, Belgium, Italy and Portugal).
SUPAIR	SUPAIR - SUstainable Ports in the Adriatic-Ionian Region supports port authorities in the implementation of low-carbon and multimodal transport and mobility solutions within a macro-regional context. The partnership, gathering 7 ports of the Adriatic-Ionian region among other partners, will establish a network of ADRION low-carbon ports.

EMPLOYMENT

Trends

- ▶ Important source for green-jobs (especially for the young) with growth potentials between 5-10%
- ▶ Sector facing labour shortages (due to lack of highly qualified personnel and work conditions)

Skills

- ▶ Skills shortages in foreign trade, environment and sustainability, digitalisation and port logistic operations
- ▶ Managerial ability to redefine just-in-time models and re-define the current supply chains and increase resilience of regional trade

Youth & Women

- ▶ Both should benefit from the transition to a greener, smarter and more resilient mobility system
- ▶ Need to enhance opportunities for youth & women offering good social conditions and attractive jobs
- ▶ High employability of youth in Logistic Port Communities
- ▶ Need to increase the women representativeness in the sector

Available research suggests a shortage of skills in the shipping sector, with existing training and education curricula often reported as outdated and lacking the innovative skills required by the sectors.⁸⁴

As such, the curricula are often unable to address the innovation potentials required to respond to the challenges identified.

As discussed in this report, for example, new technologies are essential to make maritime transport activities more sustainable (green shipping, smart ports), reduce environmental impacts and reduce overall economic costs of maritime transports activities. And yet, innovation cannot be assured without a consistent effort to upgrading existing skills through effective professional education and training schemes.

It is therefore essential to adapt the current skills of the workforce to new emerging employment needs, while promoting the digital transformation in the sector. In this respect, it is essential to accelerate the fulfilment of technical gaps existing between the northern and southern shores of the Mediterranean region.⁸⁵

Some excellent practices in innovative training approaches exist. For example the Mediterranean Institute for Maritime Training (Tunisia), is a “success-story” for North-South cooperation and a genuine example of public-private partnership, linking education and industry stakeholders to fill the gaps between needs and curricula.⁸⁶

Moreover, the Maritime Institute of Eastern Mediterranean (Cyprus) is a no-profit organization, fostering skills and know-how in the maritime transport industry (and beyond) in support of a fully sustainable blue economy.⁸⁷

The National Institute of Oceanography and Applied Geophysics (OGS) initiative on Sustainable Blue Growth also represents a cross-cutting support to the Western Mediterranean Forum on Higher Education, Research and Innovation (Dialogue 5+5) and for of all Mediterranean Countries.⁸⁸

⁸⁴ <https://www.westmed-initiative.eu/wp-content/uploads/2017/08/westmed-report5en-def-compressed.pdf>

⁸⁵ <https://medblueeconomyplatform.org/theme-2-sustainable-maritime-transport-and-ports/>

⁸⁶ <https://www.imfmm.tn/web/>

⁸⁷ <http://www.marinem.org/menu/fields-of-engagement/>

⁸⁸ <https://ufmsecretariat.org/project/blueskills-blue-jobs/>

It is essential for the sector to provide support to greater managerial skills and capabilities, to allow for the uptake of just-in-time models and sustainable approaches in managing port facilities. Similarly, promoting new positions and careers in the renewable energy sector is pivotal for a sustainable shipping.⁸⁹⁻⁹⁰

Being a historically male-dominated industry, today women represent only 2% of the sector – with 94% of female seafarers working specifically in the cruise industry globally.⁹¹ Nevertheless, while considering at future developments in the sector, it is clear that greater opportunities in employing youngsters and women should be envisaged.⁹²

In fact, the wide areas of future transformational potentials would imply greater offers in research and innovation as well as marketing and international relations, so to leverage the current level of professionalization amongst the two shores of the Mediterranean.

But the sector will have to offer greater benefits to its workforce in order to be fully competitive – and especially to be able attract young talents, both males and females.⁹³

89 https://safety4sea.com/wp-content/uploads/2019/01/World-Maritime-University-Transport-2040-Automation-Technology-Employment-The-future-of-work-2019_01.pdf

90 https://unctad.org/system/files/official-document/rmt2019ch2_en.pdf

91 <https://www.imo.org/en/OurWork/TechnicalCooperation/Pages/WomenInMaritime.aspx>

92 https://safety4sea.com/wp-content/uploads/2019/01/World-Maritime-University-Transport-2040-Automation-Technology-Employment-The-future-of-work-2019_01.pdf

93 <https://ec.europa.eu/transport/sites/transport/files/2018-business-case-to-increase-female-employment-in-transport-final-report.pdf>

COASTAL AND MARITIME TOURISM



INTRODUCTION

Coastal and maritime tourism is one of the main economic sectors for Mediterranean countries, with their accessible and attractive coastlines and coastal cities.⁹⁴ The sector is currently moving towards an already called-for transformative structural change which includes finding a suitable balance between current and future economic, social and environmental needs and opportunities.

The latest UfM Ministerial Declaration on Sustainable Blue Economy⁹⁵ already highlighted that preserved marine and coastal ecosystems as well as marine cultural heritage contribute to the attractiveness of coastal areas. At the same time, Ministers recognised that relevant policies, including research and innovation, must acknowledge the impacts of tourism activities on coastal areas, and the vulnerability and complexity of the coastal and maritime ecosystems.⁹⁶

Such change aims at untapping the economic potential of sector, at addressing its environmental impacts and at guaranteeing long-term sustainability thus matching the Sustainable Development Goals (SDGs) objectives.⁹⁷



⁹⁴ <https://ufmsecretariat.org/ufm-ministerial-conference-blue-economy/> & <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

⁹⁵ Ibid.

⁹⁶ Ibid.

⁹⁷ UNWTO Platform. Tourism 4 SDGs. Available at: <http://tourism4sdgs.org/>

OVERVIEW

Tourism is a key sector for all Mediterranean countries and the basin has consolidated its position as the world's main tourism hub.⁹⁸ Coastal and maritime tourism contributes to the total Mediterranean region GDP by an 11.3%, to the 11.5% of exports, to 6.4% of capital investments and to 11.5% of the total employment.⁹⁹⁻¹⁰⁰⁻¹⁰¹

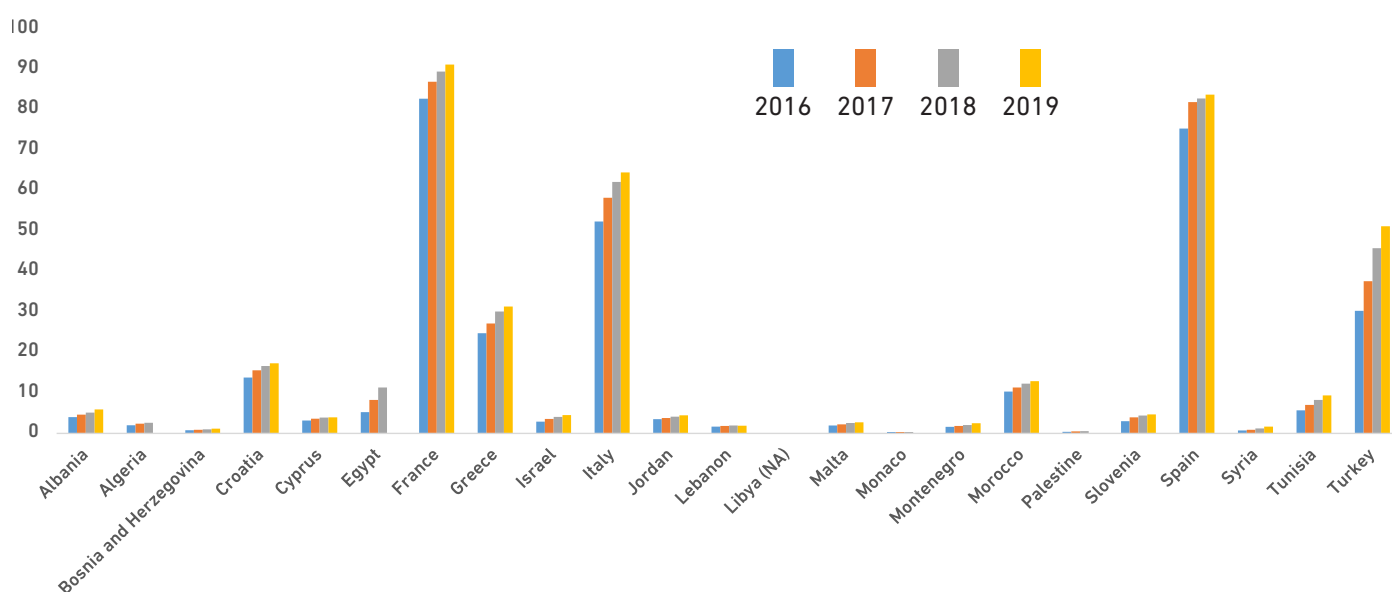
However, repartition of Mediterranean tourism flows is characterised by a strong disequilibrium and inequality, both in terms of tourism flows and economic benefits.

The North-West of the Mediterranean concentrated 64% of international tourism arrivals, the South-East Mediterranean around 17%, North-East Mediterranean 14% and South-West Mediterranean 5%.¹⁰²

Furthermore, the total contribution of tourism in the Mediterranean region was estimated at 901 billion dollars in 2015, of which North African countries received 58 billion dollars.¹⁰³

These patterns also reflect the different levels of vulnerability across the region to (regional and global) shocks to the local tourism business ecosystems.¹⁰⁴⁻¹⁰⁵⁻¹⁰⁶

Figure 5 International tourist arrivals by country of destination (million)



Source: This report | Quantitative data for 2016-2019 was extracted from UNWTO Data reports of [2017](#), [2018](#), [2019](#) and [2020](#) (*2019 data is provisional with data up to May 2020). Syria data and 2019 France data extracted from [UNWTO Tourism Dashboard data regarding seasonality](#). France and Spain data is at national level, not just for the Mediterranean region.

98 Tonazzini et al., (2019) Blue Tourism. Towards a sustainable coastal and maritime tourism in world marine regions. Edited by eco-union. Barcelona. Available at: <http://www.ecounion.eu/wp-content/uploads/2019/06/BLUE-TOURISM-STUDY.pdf>

99 Including all maritime and coastal tourism, including cruise industry, and taking into account all tangible and direct facilities of ocean-related tourism and leisure activities, such as water sports, restaurants, hotels and seaside accommodation, etc.

100 Fosse, J. & Le Tellier, J. (2017) Tourisme durable en Méditerranée: état des lieux et orientations stratégiques. Plan Bleu. Valbonne. Available at: https://planbleu.org/sites/default/files/publications/cahier17_tourisme_en_web.pdf

101 ASCAME: Mediterranean Tourism Forum: MEDITOUR 2019. Available at: <http://www.ascame.org/en/mediterranean-tourism-forum-meditour-2019>

102 Petrick et al., (2017) Blue economy in the Mediterranean. UfM. Available at: http://www.ecounion.eu/wp-content/uploads/2018/01/UfMS_Blue-Economy_Report_Template-UFM_FINAL.pdf

103 Petrick et al., (2017) Blue economy in the Mediterranean. UfM. Available at: http://www.ecounion.eu/wp-content/uploads/2018/01/UfMS_Blue-Economy_Report_Template-UFM_FINAL.pdf

104 WTTC (2017) Travel & Tourism Economic Impact North Africa 2017. Available at: <https://zh.wttc.org/-/media/files/reports/economic-impact-research/regional-2015/africa2017.pdf>

105 Caixabank Research Sector Analysis: Tourism. Available at: <https://www.caixabankresearch.com/en/sector-analysis/tourism/fight-international-tourism-mediterranean>

106 Tonazzini et al. (2019) Blue Tourism. Towards a sustainable coastal and maritime tourism in world marine regions. Edited by eco-union. Barcelona. Available at: <http://www.ecounion.eu/wp-content/uploads/2019/06/BLUE-TOURISM-STUDY.pdf>

COVID 19

Prior to COVID, the sector was recovering from the 2008 financial crisis. Forecasts envisioned an increase in the number of international tourist arrivals to continue to grow, and reach 500 million in 2030, meaning potentially 250 million international tourists in coastal areas (in addition to the domestic tourists), while an estimated GDP growth was envisioned to increase to 12.4% up to 2026.¹⁰⁷⁻¹⁰⁸⁻¹⁰⁹⁻¹¹⁰

In fact, 2019 was the highest year for tourism transits in the region (with 22.1 million passengers).

However, the COVID-19 pandemic has cut international tourist arrivals in the first eight months of 2020 to a decline of 70% if compared to previous years, which shows that this crisis could deviate existing outlooks.¹¹¹ At the same time, Africa recorded a 69% drop during this same eight-month period.

COVID EU recovery plan initiatives for tourism includes bailout funds for businesses and companies, stimulus policies for tourist exploitation, support for SMEs and start-ups as well as reviews of taxes and regulation affecting tourism. In this regard, tourism has been included in emergency responses at all levels through the creation of crisis management strategies, underlining tourism as top priority in recovery development aid programmes.

BOX 7

COVID-19 IMPACT

- ▶ 60-80% decline in international arrivals
- ▶ 120 million direct tourism jobs are at risk globally
- ▶ Need to rethink how the sector operated to move towards a sustainable recovery

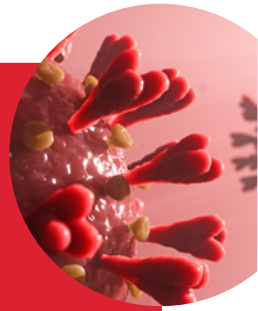
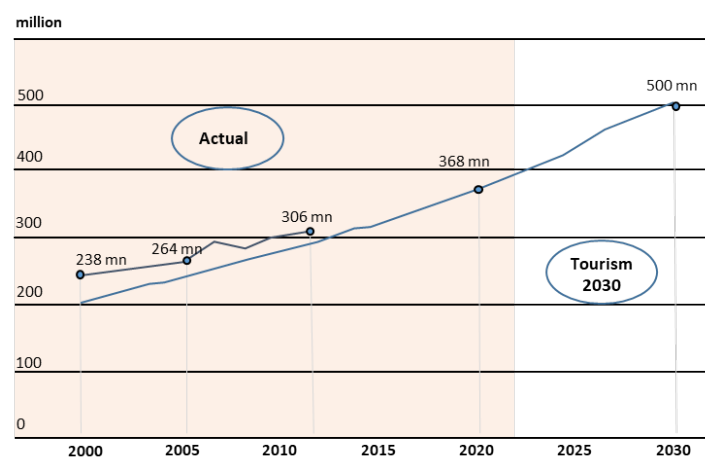


Figure 6 Future forecast for number of international tourist arrivals (prior to COVID-19 crisis)



Source: WWF -UNWTO (2016) *Tourism trend snapshot*. Derived from *Tourism in the Mediterranean*, 2015 edition.

Available at: <https://www.e-unwto.org/doi/epdf/10.18111/9789284416929>

¹⁰⁷ Note that this includes the numbers for the entire countries, not just the coastal areas which received about half of those International Tourism Arrivals

¹⁰⁸ UfM (2017) *Blue Economy in the Mediterranean Report*. Available at: https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS_Blue-Economy_Report.pdf

¹⁰⁹ UNWTO (2019). Available at: <https://www.unwto.org/news/tourisms-growth-across-all-regions-strengthens-sectors-potential-to-contribute-to-sustainable-development-agenda>

¹¹⁰ WTTC (2015) *Travel & Tourism Economic Impact 2015 Mediterranean*. Available at: <https://zh.wttc.org/-/media/files/reports/economic-impact-research/regional-2015/mediterranean2015.pdf>

¹¹¹ WTTC (2020). Available at: <https://wttc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19>

FUTURE (2021-2030)

At the latest UfM Ministerial Declaration on Sustainable Blue Economy,¹¹² already concerned by the devastating effects of the COVID-19 pandemic on the tourism sector and indirectly on other blue economy sectors, Ministers agreed to:

- Promote policy coordination, stakeholder collaboration and cooperation mechanisms to strengthen the resilience of the tourism sector in the Mediterranean;
- Develop comprehensive monitoring, evaluation and statistics schemes and promote the digitalization of the sector;
- Implement sectoral strategies and action plans to green and reduce carbon emissions from the whole tourism industry, including tourism-related maritime transport;
- Address seasonality and over tourism by promoting the diversification of the tourism offer, encouraging experience-based and slow tourism as well as associating the hinterland;
- Promote eco-tourism and niche tourism, including activities such as pesca-tourism, culinary tourism, and sport tourism, among others;
- Promote fiscal and investment policies to support sustainable coastal and marine tourism.

Challenges & Opportunities

Amongst the challenges, it should be mentioned that the sector is mostly unstable and volatile given its high sensitivity to external and internal environmental and social turbulences (such as crisis, seasonality, social conflicts, political turmoil, terrorism, insecurity, economic slowdown, unemployment, climate change, environmental degradation, coastal adaptation/protection or current COVID-19 sanitary crisis).¹¹³ In such way, the sector has been challenged by a number of different crises through time including the ongoing COVID-19. It is also now facing the need to address structural changes towards becoming more ecologically and socially sustainable as well as locally-grounded and more resilient new domestic models.¹¹⁴

At the same time, COVID-19 crisis highlighted the need to promote a better regional brand for green sustainable and value-added destinations in the Mediterranean.

Although the sector faces challenges due to its current characteristics, these also represent some opportunities for future developments, especially as far as sustainable innovation is concerned.

Despite a number of subsequent alterations due to global crisis, affecting severely both tourism destinations and related businesses across the Mediterranean, the sector has constantly proven its resilience and ability to adapt and learn from past crises.

Recent exchanges have been held with regional stakeholders, as part of an ongoing UfM Study focused on maritime and coastal tourism within a larger social and economic recovery and regeneration of the Mediterranean after the crisis.

These exchanges suggest that the effect of the current pandemic on the sector may remain at least in the mid-term (limited international travels, effects on the global demand, etc.). However, some important strategic reflections and understanding is emerging amongst businesses and policymakers, towards the need to refocus tourism offers for local visitors combining coastal and inland tourism, addressing seasonality, ensure full safety, boost sustainable and socially inclusive services and products, as well as raising the profile of the Mediterranean region as 'one destination'.¹¹⁵

It is in this sense that the sector is currently moving towards the efforts of achieving a sustainable, resilient and innovative tourism development that takes full account of its current and future economic, social and environmental aspects.

The region maintains a high potential due to its strong natural and cultural assets across the entire region. As such, a strong opportunity remains, for businesses and institutions involved in the sector across the region, to rebalance inequality in patterns of growth and push for more sustainable innovation.

¹¹² World Tourism Barometer. UNWTO (2020). Volume 18:6. Available at: <https://www.e-unwto.org/doi/epdf/10.18111/wtobarometereng.2020.18.1.6>

¹¹³ Fosse, J. & Le Tellier, J. (2017) *Tourisme durable en Méditerranée : état des lieux et orientations stratégiques*. Available at: https://planbleu.org/sites/default/files/publications/cahier17_tourisme_en_web.pdf

¹¹⁴ UfM (2017) *Blue Economy in the Mediterranean Report*. Available at: https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS_Blue-Economy_Report.pdf

¹¹⁵ EMEA-EMNES Studies (2020). *Covid-19 in the Mediterranean and Africa. Diagnosis, Policy Responses, Preliminary Assessment and Way Forward*. Available at: https://ufmsecretariat.org/wp-content/uploads/2020/04/EMEA-EMNES_Study-Covid-19_in_the_Mediterranean_and_Africa.pdf

BOX 8 Tourism Challenges and Opportunities

Mass tourism effects and the social and environmental impacts due to seasonality of the summer period.	The climate change impacts, eutrophication and related challenges by adaptation and mitigation of the sector with the development of ecotourism. ¹¹⁶⁻¹¹⁷⁻¹¹⁸⁻¹¹⁹
A diversification of the offer (i.e. alternative destinations to “sun, sea, sand”, cycle tourism, eco-tourism, nature-tourism, adventure/sports tourism, cultural tourism, gastro-tourism, health-tourism, archaeological tourism, diving and underwater tourism, etc.).	The sector’s dependency of natural ecosystems towards developing growth potentials that capture the value of biodiversity (benefits estimated over €26 billion/year). ¹²⁰⁻¹²¹⁻¹²²⁻¹²³
The persisting unsustainable impacts of current business models on natural ecosystems (leading to loss of habitats/biodiversity, an unsustainable exploitation of resources, maritime pollution and litter, CO2 emissions, etc.). ¹²⁴	The lack of resilience of the sector by reconsidering the added value creation model (more local added value production) and developing synergies between sectors.

The overall growth capacity of the sector through more sustainable and value-adding models remains high with recovery paths which would include developments such as: developing of the Mediterranean as a single sustainable tourism destination brand, the fostering of innovation in products, services and business models for fully sustainable, safe and accessible sustainable touristic destinations, the need for greater ability to plan and develop green tourism infrastructures, as well as the full uptake of digitalisation potentials towards the diversification of touristic markets, products and services across the region.¹²⁵⁻¹²⁶

Technological developments (including innovation and digitalisation) are also expected to continue propelling the travel experience on its trajectory towards becoming more seamless, frictionless and of high quality, in a way that contributes to the achievement of the United Nation’s Sustainable Development Goals (SDGs).

The use of technologies, including the ‘Internet of Things’, location-based services, artificial intelligence, augmented and virtual reality, and blockchain technology have resulted in a tourism offer that is more attractive, efficient, inclusive, and economically, socially and environmentally sustainable as compared to previous offers.

BOX 9 Smart Destinations

A smart destination is one with a strategy for technology, innovation, sustainability, accessibility and inclusivity along the entire tourism cycle: before, during and after the trip.

A smart destination is also one with residents as well as tourists in mind, factoring multilingualism, cultural idiosyncrasies and seasonality into tourism planning.

116 UfM (2018). Climate Change impact on the tourism sector in the southern Mediterranean: Forseen development and policy measures. Available at: https://ufmsecretariat.org/wp-content/uploads/2018/11/UfMReport_ClimateChangeAndTourism.pdf

117 Coll et al., (2010) The Biodiversity of the Mediterranean Sea: Estimates, Patterns, and Threats. PLoS ONE vol. 5:8 e11842

118 UfM (2017) Blue Economy in the Mediterranean Report. Available at: https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS_Blue-Economy_Report.pdf

119 UfM (2017) Greening the Blue Economy. Available at: <https://medblueeconomyplatform.org/wp-content/uploads/2020/08/file-library-3c13f1fc9ba7569958bb.pdf>

120 MedPAN et. al., (2016) The 2016 status of Marine Protected Areas in the Mediterranean: Main findings. Brochure. Available at: <https://drive.google.com/file/d/0Bw8D-TFFFcc>

121 WWF (2019). Value at Risk in the Blue Economy: Piloting a Systems Modeling Approach to Explore Sustainability Pressures and Financial Risk. Available at: https://www.eu.awsassets.panda.org/downloads/metabolic_wwf_value_at_risk_in_the_blue_economy_29112019_lr.pdf

122 IUCN Regions: Mediterranean. Available at: <https://www.iucn.org/regions/mediterranean>

123 MedPAN et. al., (2016) The 2016 status of Marine Protected Areas in the Mediterranean: Main findings. Brochure. Available at: <https://drive.google.com/file/d/0Bw8D-TFFFcc>

124 MedPAN et. al., (2016) The 2016 status of Marine Protected Areas in the Mediterranean: Main findings. Brochure. Available at: <https://drive.google.com/file/d/0Bw8D-TFFFcc>

125 ASCAME (2020). Recovery plan and a new economic development model for the Mediterranean. Available at: http://www.ascame.org/sites/default/files/ascame_recovery_plan_short.pdf

126 OECD Policy Responses to Coronavirus (COVID-19) (2020) Rebuilding tourism for the future: COVID-19 policy responses and recovery. Available at: <http://www.oecd.org/coronavirus/policy-responses/rebuilding-tourism-for-the-future-covid-19-policy-responses-and-recovery-bced9859/>

It has also facilitated innovation and rethinking of processes, with a view to tackling challenges such as seasonality, overcrowding and developing smarter destinations.

Digitalisation has already had a positive environmental impact and can yet have a greater one, with innovations in manufacturing, smart assets and efficient use of resources contributing to a more sustainable industry footprint.

Some major impacts on the sector as a whole are the development of smart travel facilitation, smart destinations and a new wave of job profiles.

This is why smart destinations are key to the transformation of the tourism sector.

By continuously and accurately collecting, integrating and analysing data for efficient decision-making, prioritisation and anticipation of challenges, they create a seamless and exciting experience for tourists while managing local resources efficiently.

BOX 10 Some Projects to Strengthen Tourism

HERIT-DATA	Aims to identify innovative solutions, with the support of new technologies and big data, to reduce the negative impacts of tourism on cultural and natural heritage sites. The project started in April 2018 and will last until March 2022. ¹²⁷
ShapeTourism	Aims at generating an innovative holistic methodology able to shape and drive sustainable tourism development ensuring attractiveness, growth and sustainability of Med Cultural Destination. ¹²⁸
MED GAIMS	Aims to increase tourism flows, covering all niches and segments like off-season travellers, creating jobs opportunities and start-ups for game entrepreneurs. For this, the project will develop games in physical and virtual format to create experiences for tourists, giving a necessary competitive edge to the attractiveness of less-known sites. ¹²⁹
SMART MED	Aims to address key MED region challenges, such as high seasonality and lack of cooperation among key stakeholders, in the development of smart, inclusive and sustainable tourism. ¹³⁰
BEST MED	Aims to contribute to the objective of enhancing Mediterranean Governance, being the main challenges to fight against seasonality and lack of effective cooperation among main tourism actors, including the citizen active participation on the policies design. ¹³¹
Promotion of Sustainable Tourism in Tunisia	Aims to diversify and strengthen the quality of Tunisian tourism offers. The focus lies on cultural and nature tourism products in selected regions. Thus, the sector contributes to a sustainable strengthening of the economy and an improvement of the Tunisian labour market. ¹³²

¹²⁷ HERIT-DATA project website: <https://herit-data.interreg-med.eu/>

¹²⁸ ShapeTourism project website: <https://shapetourism.interreg-med.eu/>

¹²⁹ MED GAIMS project website: <http://www.enicbcmmed.eu/projects/med-gaims>

¹³⁰ SMART MED project website: <https://smartmed.interreg-med.eu/>

¹³¹ BEST MED project website: <https://best-med.interreg-med.eu/>

¹³² Promotion of Sustainable Tourism in Tunisia project website: https://www.giz.de/en/downloads/Factsheet%20F%C3%B6rderung%20des%20nachhaltigen%20Tourismus_EN.pdf

BOX 11 Opportunity Fields in Tourism**One Destination**¹³³

Developing a common brand for the Mediterranean as a single global destination, to further attract and fully capitalize on the International tourism visiting (or potentially attracted to) the seabasin.

Smart Destination

i.e. technological developments including digitalization, the Internet of Things, location-based services, artificial intelligence, augmented and virtual reality, and blockchain technology.

Sustainable Destination
Branding.**Competitive diversified**
market of products and services.¹³⁴

¹³³ ARLEM (2019). Report on the Blue economy for local and regional authorities in the Mediterranean. COR-2019-04007-00-02-TCD-TRA (EN) 1/9. Available at: <https://medblueeconomyplatform.org/wp-content/uploads/2020/10/file-library-537056f329410ec71b48.pdf>

¹³⁴ ASCAME (2020). Recovery plan and a new economic development model for the Mediterranean. Available at: http://www.ascame.org/sites/default/files/ascame_recovery_plan_short.pdf

EMPLOYMENT

Trends

- Important source for jobs. 2.5 M jobs South Med in 2017 and 4.9 M in 2019

Skills

- Need to foster sustainable partnerships among stakeholders to translate the sector's growth agenda into a comprehensive skills strategy and to take action to address sectorial skills needs

Youth & Women

- 54% of people employed in core tourism activities are women
- Youth unemployment opportunities exist (i.e. new technologies & innovation)

The tourism sector is an important source for growth and jobs, especially for youth, as 13% of the tourism-related work force are aged under 25. Tourism is also the largest employer of migrant workers, part-time workers, as well as female workers (58% of people employed in core tourism activities are women).¹³⁵

Maritime or ocean-related tourism, as well as coastal tourism, are vital sectors of the economy in many countries. Coastal and ocean-related tourism come in many forms. They include dive tourism, maritime archaeology, surfing, cruises, ecotourism, and recreational fishing operations.

Main players in the blue economy are: NGOs, trade unions, universities, young people, local and regional administrations and the media. However, the sector is mostly comprised of SMEs and micro-enterprises which are more prone to experience vulnerability to economic, financial and political changes.¹³⁶

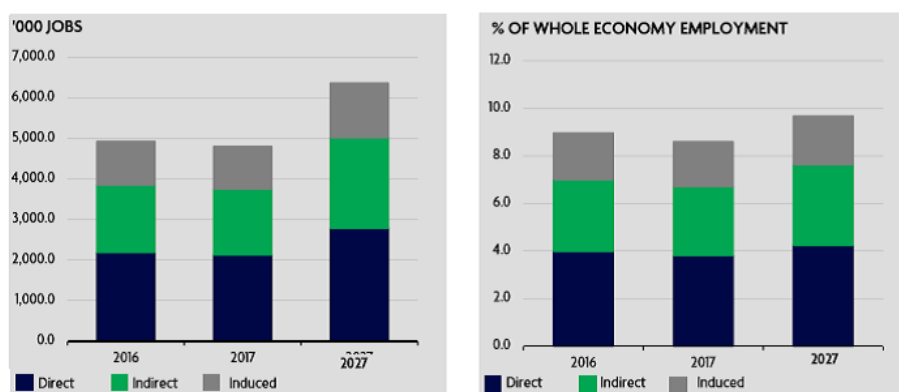
In this regard, jobs have also been hit hard by the COVID-19 pandemic and global travel restrictions. In fact, about 100 to 120 million direct tourism jobs could be at risk.¹³⁷

Globally, tourism job losses for 2020 were projected at 98.2 million for the upside scenario, 121.1 million for the baseline and 197.5 million for the downside scenario.¹³⁸

However, as part of EU's Blue Growth strategy, the coastal and maritime tourism sector has been identified as an area with special potential to foster a smart, sustainable and inclusive Europe.

In this regard, sustainable tourism can be crucial to the blue economy, promoting conservation and sustainable use of marine environments and species, generating income for local communities (thus alleviating poverty) as well as maintaining and respecting local cultures, traditions and heritage.

Figure 7 North Africa: total contribution of travel and tourism to employment



Source: WTTC (2017) & UfM (2017)

¹³⁵ EC (2017) Blueprint for sectoral cooperation on skills. Responding to skills mismatched at sectoral level. Available at: <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=7969>

¹³⁶ EC (2020). The Blue Economy Report 2020. Available at: https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/2020_06_blueeconomy-2020-ld_final.pdf

¹³⁷ WTTC (2020). Available at: <https://wtcc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19>

¹³⁸ Ibid.

In this context, if it is well managed and monitored tourism can be an important contributor to sustainable development.¹³⁹

Jobs related to the sustainable consumption and production, effective resource management, biodiversity conservation and environment protection are some of the opportunities for the sector to progress in the fight against climate change and advance amongst all 17 SDGs (i.e. SDG 14).¹⁴⁰

Other opportunity fields such as technological developments including i.e. digitalisation, will require both technical and advanced soft skills in order to effectively implement and manage smart initiatives.

In this regard, the European Commission European Strategy aims to develop innovative and smart solutions within the tourism sector, through the suggestion of a skills-based

education, training and policies that stimulate innovation and decent employment.¹⁴¹⁻¹⁴²

Similarly, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is also financing a series of trainings on blue skills¹⁴³ as well as the UfM, who is also directly addressing this issue together with other divisions.

Overall, a push towards more ecologically and socially sustainable models is expected, driven by motives of favouring greater economic returns to local communities and building more quality and value-added jobs. These positive prospects make both for a potential positive impact but also a challenge with regards to the need for skilled workers. Businesses in the industry, in particular SMEs, struggle to find and retain skilled employees and several challenges have been identified (see box 12)

BOX 12 Challenges to find and retain skilled employees

The sector does not appear high on the list of the most popular graduate jobs, in particular due to a negative perception of job quality, seasonality and limited career prospects.

New hard-skills are needed for newly developed occupations (e.g. destination management, sustainable tourism, cultural tourism, adventure tourism, accessible tourism, green tourism, climate change adaptation management, carbon neutral efforts, circular economy knowledge, new business models in tourism, e-marketing, e-commerce, business management skills) and tourism professionals are expected to deliver innovative, customised and value added services for a wider range of target groups, including seniors, or travellers with special needs (disabilities, etc.)¹⁴⁴

Education providers have a limited understanding of employers' requirements and travellers' expectations.

Key skill gaps have been identified for the traditional core soft-skills (foreign languages, interpersonal skills, communication and social media, multicultural knowledge, customer service, cultural awareness, problem/solving skills).

The rapid expansion and evolution of innovation and digitalisation in the tourism sector requires new, specific knowledge not only from employees, but also from tourism entrepreneurs. SMEs often lack the necessary e-management skills to keep up with the developments of online market places and distribution channels, as well as new forms of marketing and communication with customers.

Cross-border and transnational mobility needs to be encouraged more.

¹³⁹ World Bank and United Nations Department of Economic and Social Affairs (2017) The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries. World Bank, Washington DC. Available at: <https://medblueeconomyplatform.org/wp-content/uploads/2020/08/file-library-515c5308a8598b56379f.pdf>

¹⁴⁰ UNWTO Annual report (2017). Available at: <https://www.e-unwto.org/doi/epdf/10.18111/9789284419807>

¹⁴¹ EC (2014) A European Strategy for more Growth and Jobs in Coastal and Maritime Tourism. Available at: https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/body/coastal-and-maritime-tourism_en.pdf

¹⁴² UNWTO webpage on Digital Transformation. Available at: <https://www.unwto.org/digital-transformation>

¹⁴³ GIZ website: <https://www.giz.de/en/html/index.html>

¹⁴⁴ See efforts such as the The "Skills Passport in Hospitality and Tourism" within EURES including specific skills lists for three tourism subsectors (adventure, cultural and blue tourism)

Tourism is also the largest employer of female workers (58 % of people employed in core tourism activities are women),¹⁴⁵ but they are underrepresented, predominantly in leadership and managerial positions.

At the same time, female participation is often concentrated in the lowest paid and lowest skilled sectors of the Tourism industry. In fact, women earn 14.7% less than their male co-workers

This existing gender gap is vulnerable to being exacerbated due to the COVID crisis, where employment in accommodation and food services is currently at high risk (and is where more than half workers are women).

The tourism sector has a pivotal role to play in achieving the commitments at the heart of the 2030 Agenda for Sustainable Development – including commitments to gender equality, which could be achieved through implementing strategies that promote decent work for women across all aspects of the tourism sector.

These include tourism in gender-sensitive legal and macroeconomic policies or developing technological and digital skills and leadership trainings for women in tourism.¹⁴⁶

BOX 13 Achieving Gender Equality Commitments through...

Implementing strategies that promote decent work for women across all aspects of the tourism sector.

Include tourism in gender-sensitive legal and macroeconomic policy, in order to ensure the sector is able to contribute to gender equality and women's empowerment.

Develop skills and leadership training for women in tourism, as well as gender equality training programmes for tourism representatives in the public and private sectors.

Mainstream gender equality considerations in national tourism policies and plans, including committing sufficient human and financial resources to ensure that these are fully institutionalised and implemented.

Support grassroots women's organizations in tourism communities and fully facilitate women's participation and leadership in trade unions across the sector.

Increase women's participation in training on digital technologies in tourism, while at the same time address issues of women's access to and usage of technology.

Strengthen national capacity to research and report on gender disaggregated tourism data and to use it to promote gender equality and women's empowerment.

¹⁴⁵ EC (2017) Blueprint for sectoral cooperation on skills. Responding to skills mismatched at sectoral level. Available at: <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=7969>

¹⁴⁶ World Tourism Organization (2019), Global Report on Women in Tourism – Second Edition, UNWTO, Madrid. Available at: <https://www.e-unwto.org/doi/pdf/10.18111/9789284420384>

MARINE RENEWABLE ENERGIES



INTRODUCTION

Offshore wind energy, wave energy converters, tidal stream technologies, ocean thermal energy conversion and floating solar are all types of energy being increasingly developed in recent years.¹⁴⁷

These types of marine energy contribute €36.1 billion to the European Union's GDP, €1.1 billion of EU total GVA and account for 4,624 persons employed.¹⁴⁸⁻¹⁴⁹⁻¹⁵⁰

Additionally, they could provide up to 10% of Europe's electricity needs by 2050.¹⁵¹

However, the development of marine renewable energy (MRE) sources in the Mediterranean is for the time being lower than in other EU sea basins – for reasons related to natural conditions such as lower wind, tide and current as well as greater depths in the Mediterranean.¹⁵²

Despite this limitation, there are numerous locations in the Mediterranean Sea with considerable development potentials. Offshore wind energy is considered as an important promising MRE sector.

Its production could reach up to 12GW by 2030 and close to 40GW by 2050 for the Mediterranean EU countries.¹⁵³

In addition, a highly promising area for wave-energy is comprised between Sardinia and Balearic Islands, with around 9.5 kW/m estimated.¹⁵⁴

Albeit still embryonic, marine renewable energy remains therefore a potentially fast-growing blue sector for the region. One with considerable development potentials for the Mediterranean region, both in terms of technological development and employment opportunities.¹⁵⁵



¹⁴⁷ Ocean Energy Europe. Available at: <https://www.oceanenergy-europe.eu/ocean-energy/>

¹⁴⁸ MSP Platform (2018) Sector Fiche: Offshore Wind Energy. Available at: mispforbluegrowth_sectorfiche_offshorewind.pdf (msp-platform.eu)

¹⁴⁹ European Commission (2020). The EU Blue Economy Report. 2020. Publications Office of the European Union. Luxembourg. Available at: https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf

¹⁵⁰ Ibid.

¹⁵¹ Ocean Energy Europe. Available at: <https://www.oceanenergy-europe.eu/ocean-energy/>

¹⁵² Interreg Med Mistral. Available at: https://interreg-med.eu/fileadmin/user_upload/Sites/Blue_Growth/Projects/MISTRAL/blue_book_v5_low_res.pdf

¹⁵³ Interreg Med Blue Growth. Available at: <https://cpmr-intermed.org/download/blue-growth-policy-paper/?wpdmdl=9591&ind=1574776164297>

¹⁵⁴ Interreg Med Blue Growth. Available at: <https://cpmr-intermed.org/download/blue-growth-policy-paper/?wpdmdl=9591&ind=1574776164297>

¹⁵⁵ MSP Platform (2018) Conflict fiche 1: Maritime tourism (incl. local communities) and offshore wind. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/1_tourism_offshore_wind.pdf

OVERVIEW

Regardless of its relatively early stage compared to other global oceans, marine renewable energy still offers interesting development potentials for the Mediterranean.

Taking into account the geomorphological characteristics of the Mediterranean and the technological maturity, two technologies seem to be the most promising for the region: offshore wind and waves.¹⁵⁶

Floating solar is also considered as one of the new frontiers of offshore technologies with promising growth trends.¹⁵⁷

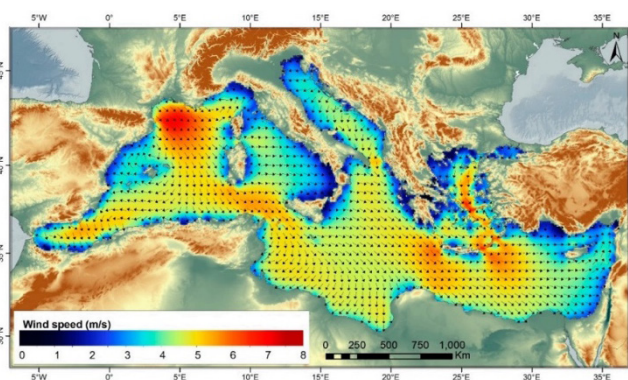
Mediterranean wind pattern presents several localised extremes, such as the Gulf of Lion and the central Aegean Sea (mean annual wind speed of the order of 8 m/s), and the Kasos Straits in south-eastern Aegean Sea.¹⁵⁸

Meanwhile, the most effective wave energy fluxes are met in the Western Mediterranean and the Ionian Sea.¹⁵⁹

Of all the technical options, Offshore Wind Energy (OWE) is currently the most mature type of marine renewable energy in the Mediterranean. Its level of development in terms of technology, policy frameworks, commercialization and installed capacity makes it a promising area for economic development in the region.¹⁶⁰

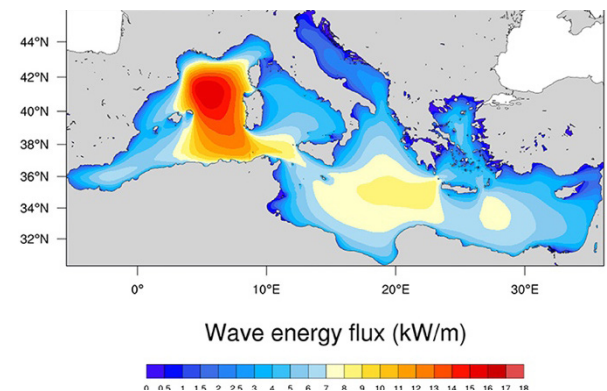
OWE technologies and devices for the conversion of such sources of energy into electricity are now ready for full-scale deployment in Mediterranean farms, allowing the transition from demonstration to operability and commercial exploitation.¹⁶¹

Figure 8 Mean annual wind climate (at 10 m above sea level) in the Mediterranean Sea (ETA model)



Source: Soukissian et al., (2017). *Marine Renewable Energy in the Mediterranean Sea: Status and Perspectives*. *Energies*. 10(10): 1512. <https://doi.org/10.3390/en1010151210.3390/en>. Available at: <https://www.mdpi.com/1996-1073/10/10/1512>

Figure 9 Mean climatological wave energy flux in the Mediterranean for years 2001–2010



Source: Pisacane et al., (2018). *Marine Energy Exploitation in the Mediterranean Region: Steps Forward and Challenges*. *Frontiers in Energy Research* 6: 109. 10.3389/fenrg.2018.00109. Available at: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full>.

¹⁵⁶ Soukissian et al., (2019) Marine Renewable Energy Clustering in the Mediterranean Sea: The Case of PELAGOS Project. *Frontiers in Energy Research* 7: 16. Available at: <https://www.frontiersin.org/article/10.3389/fenrg.2019.00016>

¹⁵⁷ <https://www.offshore-energy.biz/ocean-sun-inks-mediterranean-floating-solar-deal/>

¹⁵⁸ Soukissian, Takvor & Denaxa, Dimitra & Karathanasi, Flora & Prospathopoulos, Aristides & Sarantakos, Konstantinos & Iona, Sissy & Georgantas, Konstantinos & Mavrakos, Spyridon. (2017). *Marine Renewable Energy in the Mediterranean Sea: Status and Perspectives*. *Energies*. 10(10): 1512. <https://doi.org/10.3390/en1010151210.3390/en>. Available at: <https://www.mdpi.com/1996-1073/10/10/1512>

¹⁵⁹ Soukissian, Takvor & Denaxa, Dimitra & Karathanasi, Flora & Prospathopoulos, Aristides & Sarantakos, Konstantinos & Iona, Sissy & Georgantas, Konstantinos & Mavrakos, Spyridon. (2017). *Marine Renewable Energy in the Mediterranean Sea: Status and Perspectives*. *Energies*. 10(10): 1512. <https://doi.org/10.3390/en1010151210.3390/en>. Available at: <https://www.mdpi.com/1996-1073/10/10/1512>

¹⁶⁰ Nikolaidis G, Karaolia A, Matsikaris A, Nikolaidis A, Nicolaidis M and Georgiou GC (2019) Blue Energy Potential Analysis in the Mediterranean. Available at: https://maestrale.interreg-med.eu/fileadmin/user_upload/Sites/Blue_Growth/Projects/MAESTRALE/fenrg-07-00062.pdf

¹⁶¹ Pisacane G, Sannino G, Carillo A, Struglia MV and Bastianoni S (2018) Marine Energy Exploitation in the Mediterranean Region: Steps Forward and Challenges. *Front. Energy Res.* 6:109. doi: 10.3389/fenrg.2018.00109. Available at: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full>

Amongst OWE technologies, floating offshore wind farms are also particularly fit for the Mediterranean specificities, as they can be deployed in deeper waters and further off from the coasts where other concurring activities would be obstacles to their full deployment.¹⁶²

So far, nevertheless, offshore wind projects are mostly at a pilot stage in EU Mediterranean Countries (France, Greece, Italy, and Portugal) mostly in the planning and permitting development stages, with still undefined delivery dates.

¹⁶³⁻¹⁶⁴

France has deployed the first three pilot farms in the Mediterranean Sea, with their commissioning expected in 2021 (EolMed (24 MW); Provence Grand Large (28.5 MW) and Golfe du Lion Floating Offshore - EFGL (30 MW)).¹⁶⁵

In Italy, the 7Seas Med project is seeking to obtain a 30-year maritime state concession to install a 250MW floating wind farm, 35 kilometres from the coast in the Strait of Sicily.¹⁶⁶

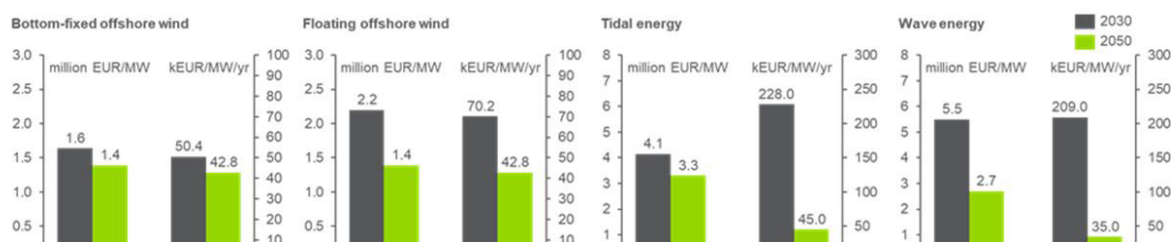
If we look at the estimated costs for floating offshore wind, these are currently higher than bottom-fixed, but the difference is expected to decrease towards 2050.¹⁶⁷

At the same time, other forms of ocean energy, such as wave and tidal energy technologies, are still experimental, despite having proven good potential.

According to the "Ocean SET 2020" report, four EU Mediterranean countries (Italy, France, Portugal, Spain) have already adopted specific policies for the exploitation of wave and tidal power for energy purposes.¹⁶⁸

If we look at the estimated cost of these two technologies, wave and tidal energy technologies' costs are expected to continue to remain significantly higher (5.5 times and 4 times as high as the investment costs for onshore wind, respectively), but they are also on a decreasing path towards 2050 (especially for wave energy technology).¹⁶⁹

Figure 10 Study on the Offshore Grid potential in the Mediterranean Region



Source: Specific CAPEX and OPEX input values used for 2030 and 2050 to calculate LCOE levels per offshore technologies
<https://op.europa.eu/en/publication-detail/-/publication/91d2091a-27bf-11eb-9d7e-01aa75ed71a1> (Nov. 2020)

¹⁶² Francocci et al., (2019) MISTRAL Blue Growth Book. State of the art assessment and overview on the most relevant drivers and opportunities in the Mediterranean Blue Economy. MISTRAL project, Deliverable D3.1.2; DOI 10.5281/zenodo.3242281. Available at: https://interreg-med.eu/fileadmin/user_upload/Sites/Blue_Growth/Projects/MISTRAL/blue_book_v5_low_res.pdf

¹⁶³ Drobinski P, Azzopardi B, Ben Janet Allal H, Bouchet V, Civel E, Creti A, Duic N, Fylaktos N, Mutale J, Pariente-David S, Ravetz J, Taliotis C, Vautard R (2020) Energy transition in the Mediterranean. In: Climate and Environmental Change in the Mediterranean Basin – Current Situation and Risks for the Future. First Mediterranean Assessment Report [Cramer W, Guiot J, Marini K (eds.)] Union for the Mediterranean, Plan Bleu, UNEP/MAP, Marseille, France, 58pp, in press. Available at: https://www.medecc.org/wp-content/uploads/2020/11/MedECC_MAR1_3_3_Energy_transition_in_the_Mediterranean.pdf

¹⁶⁴ Ibid

¹⁶⁵ Wind Europe (2019) Offshore wind in Europe. Key trends and statistics 2019. Available at: [WindEurope-Annual-Offshore-Statistics-2019.pdf](https://www.wind-europe.eu/Offshore-Statistics-2019.pdf)

¹⁶⁶ <https://renewablesnow.com/news/corrected-7-seas-med-seeks-concession-for-250-mw-floating-wind-project-off-italy-705512/>

¹⁶⁷ European Commission (2020) Study on the offshore grid potential in the Mediterranean Region. Publications Office of the European Union. Luxembourg. Available at: <https://op.europa.eu/en/publication-detail/-/publication/91d2091a-27bf-11eb-9d7e-01aa75ed71a1/language-en>

¹⁶⁸ OceanSET (2020) First Annual Report. Available at: https://www.oceanset.eu/wp-content/uploads/2020/05/OceanSET_FirstAnnualReport_April2020_with-infographic.pdf

¹⁶⁹ European Commission (2020) Study on the offshore grid potential in the Mediterranean Region. Publications Office of the European Union. Luxembourg. Available at: <https://op.europa.eu/en/publication-detail/-/publication/91d2091a-27bf-11eb-9d7e-01aa75ed71a1/language-en>

Conflicts in the different usages of maritime space may be challenging a further deployment of the sector in the region. This is particularly the case for conflicts emerging with other relevant maritime activities (tourism, fisheries, and maritime transport) and challenges for ecosystem conservation.¹⁷⁰⁻¹⁷¹⁻¹⁷²⁻¹⁷³

Furthermore, the development of offshore wind farms can include both negative and positive effects as they may be a source of underwater noise and could constitute a stepping stone for invasive species. At the same time, they may act as artificial reefs and/or fish aggregating devices, or even create fishery exclusion zones acting as marine protected areas where trawling and gillnetting, for example, are prohibited.¹⁷⁴

Therefore, the further development of the sector should occur after a proper assessment of potential impacts and through an important stakeholder engagement process so as to achieve a successful and effective coexistence amongst maritime uses.

Other challenges relate to the need for proper regulatory frameworks – including proper Marine Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) – financial instabilities in some countries, a lack of available space for offshore operations, and the Mediterranean underwater structure. All those issues together are posing structural limitations to the full development of the sector.¹⁷⁵⁻¹⁷⁶

A strong initial impact of the COVID-19 crisis in marine renewables was observed in Northern Mediterranean countries, but also a prompt recovery due to the resilience of the sector.¹⁷⁷

Following the outbreak of the coronavirus crisis, renewable energy investments saw a 34% decline in the first half of 2020, compared with the same period in 2019.

However, the current pandemic seems to have increased investors' interest in more sustainable assets.¹⁷⁸

Despite major disruptions in the wind industry supply chain during the first semester of 2020, particularly regarding production, assembly and imports of main wind turbine components, European countries managed to install 1.2GW offshore.¹⁷⁹

To date, offshore wind has been less impacted than most energy sectors by the pandemic.

170 MSP Platform (2018) Conflict fiche 1: Maritime tourism (incl. local communities) and offshore wind. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/1_tourism_offshore_wind.pdf

171 MSP Platform (2018) Conflict fiche 5: Offshore wind and commercial fisheries. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/5_offshore_wind_fisheries.pdf

172 MSP Platform (2018) Conflict fiche 7: Transport and offshore wind. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/7_transport_offshore_wind_kg.pdf

173 MSP Platform (2018) Conflict fiche 8: Conservation and offshore wind. Available at: https://www.msp-platform.eu/sites/default/files/sector/pdf/8_offshore_wind_conservation.pdf

174 Ashley, Mangi and Rodwell (2014). The potential of offshore windfarms to act as marine protected areas – a systematic review of current evidence. *Mar Pol*, 45: 301-309. 10.1016/J.MARPOL.2013.09.002

175 Soukissian et al., (2019) Marine Renewable Energy Clustering in the Mediterranean Sea: The Case of PELAGOS Project. *Front. Energy Res.* 7:16. Available at: <https://tethys.pnnl.gov/sites/default/files/publications/Soukissian-2019-Med-Sea.pdf>

176 Zountouridou et al., (2015) Offshore floating wind parks in the deep waters of Mediterranean Sea. *Renewable and Sustainable Energy Reviews* 51: 433-448. Available at: <https://www.sciencedirect.com/science/article/pii/S1364032115005973>

177 GWEC (2020) Global Offshore Wind Report 2020. Available at: <https://gwec.net/wp-content/uploads/2020/12/GWEC-Global-Offshore-Wind-Report-2020.pdf>

178 IRENA and CPI (2020), Global Landscape of Renewable Energy Finance, 2020, International Renewable Energy Agency, Abu Dhabi. Available at: https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2020/Nov/IRENA_CPI_Global_finance_2020.pdf

179 <https://windeurope.org/>

FUTURE (2021-2030)

Marine renewables are currently a fast-growing blue sector, with considerable development potential for the Mediterranean in the forthcoming years.

The Energy Transition Scenario formulated by the Mediterranean Energy Observatory (OME), has suggested that renewable energy uptake in the region will triple its current performance by 2040, hence reaching about 27% of overall energy consumption, at an average growth rate of 4.3% per year. In that scenario, which covers all sort of renewable sources, most of the increase is expected to be powered through wind and solar.

In parallel, nevertheless, Wind Europe projections focussed more specifically on the sector and estimated a total 70GW of offshore wind energy produced in Southern European waters by 2040.¹⁸⁰

The forthcoming years will be crucial in unlocking the potential of marine energies in the Mediterranean.

As an important area of development opportunity for the future, it is important to underline that marine renewable energies are relevant alternative technologies to polluting and unsustainable 'traditional' sources – and are increasingly being supported by public financing.

As such they cover a prominent role, notably, within the European Green Deal and the COVID recovery package.¹⁸¹⁻¹⁸²

The existing strong port infrastructure, coupled with an experience in more traditional energy sources in a number of Mediterranean countries, is likely to favour its further development in the future.

In addition, the constant decline of the cost of maritime renewable energy is also a positive factor that may trigger a growing interest in the development of the sector.¹⁸³⁻¹⁸⁴⁻¹⁸⁵

However, some important aspects need to be duly considered for full development of the sector in the future.

These would include:

- **Sustainability:** Renewable energy is usually unlimited and (conditional of appropriate management) sustainable, which could drastically reduce greenhouse gasses emission. The clean and renewable energy resources of the world Ocean can be exploited in several ways. Therefore, the necessity for marine renewable energies (MRE) development is evident. MRE are recognised as an important sector which can play a crucial role in meeting the reduction targets in greenhouse gas emissions and in combatting climate change. As such, MRE will help Europe to move towards the desired carbon neutrality;
- **Conservation:** As the sector is far from being fully deployed in the Mediterranean, its impacts are likewise largely to be assessed as well as the potential adverse effects. Mitigation measures are also still to be designed. As such, MRE should always consider taking safety precautions in order to avoid or minimize environmental their environmental impacts (especially when moving further offshore);
- **Innovation:** MRE should enhance the research and innovation capacities and efforts towards the development of technologies that would allow to fully exploit the potential of MRE sources of the Mediterranean;
- **Digitalisation:** As a newcomer asking for allocation of dedicated maritime spaces, MRE are pushing the development of the knowledge related to the ongoing maritime activities to reduce conflicts and risks. The use of maritime surveillance data is starting to provide a full picture of the activities which is paving the way for an agreed maritime spatial where MRE could be developed.

¹⁸⁰ https://www.cire.pl/pliki/1/2019/windeurope_our_energy_our_future.pdf

¹⁸¹ European Commission (2020) An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0741&from=EN>

¹⁸² IRENA (2020) Fostering a blue economy: Offshore renewable energy, International Renewable Energy Agency, Abu Dhabi. Available at: <https://www.irena.org/publications/2020/Dec/Fostering-a-blue-economy-Offshore-renewable-energy>

¹⁸³ ESMAP (2019) Going Global: Expanding Offshore Wind to Emerging Markets. Washington, DC: World Bank. Available at: <http://documents1.worldbank.org/curated/en/716891572457609829/pdf/Going-Global-Expanding-Offshore-Wind-To-Emerging-Markets.pdf>

¹⁸⁴ <https://www.gminsights.com/industry-analysis/offshore-wind-energy-market>

¹⁸⁵ IRENA (2020) Fostering a blue economy: Offshore renewable energy, International Renewable Energy Agency, Abu Dhabi. Available at: <https://www.irena.org/publications/2020/Dec/Fostering-a-blue-economy-Offshore-renewable-energy>

- **Licensing:** MRE regulatory frameworks should be enhanced and the licensing process should be facilitated while preserving adequate assessment and public consultation prior to installing MRE infrastructures;
- **Multi-use platforms:** The anthropogenic demand for marine resources and space exerts the need for novel concepts for sustainable resource exploitation and smart space allocation. Multi-Use (MU) is an emerging concept to overcome spatial claims and support Blue Growth. Emerging MU potentials exist related to Floating Offshore Wind energy and aquaculture (i.e. Gulf of Lion) and these should be further enhanced and supported in the future.¹⁸⁶
- **Co-existence with other maritime uses:** MRE should further develop the potential for combining different marine activities (i.e. renewable energy, aquaculture, fisheries, bio-resources, environmental conservation and restoration, maritime transport, desalination, and tourism services) in the same marine space through their co-existence;
- **Opportunities for MRE in ISLANDS:** MRE are recognised as having a potential important role for the sustainable development of coastal areas and islands. This potential is all the more important for the islands, as with a direct connection, energy is directly available for consumption. The LCoE is lower than the Fuel electricity centrals. MRE can be complementary of the renewable energies on the land and takes less space.

An example towards MRE development in the Mediterranean was the project PELAGOS (Promoting innovative networks and clusters for marine renewable energy synergies in Mediterranean coasts and islands).

It was expected to create a Mediterranean cluster¹⁸⁷ that stimulates blue growth, the development of relevant technological innovations and to accelerate the exploitation of the relevant technological innovation in the market sector.¹⁸⁸⁻¹⁸⁹ Other projects in the Mediterranean Sea are shown in box 14.

BOX 14 MRE development in the Mediterranean

PELAGOS project: Aimed to define a management and coordination system among the participating countries (Greece, Italy, Portugal, Spain, Cyprus, France, Croatia), connecting the different components of the Quadruple Helix (i.e., the public sector, the business community, the higher education institutions and civil society) that represents the linkages and the potential conflicts between knowledge production and knowledge use in the field of marine energy.¹⁹⁰

MAESTRALE project: Intended to lay out the basis for a Maritime Energy Deployment Strategy in the Mediterranean, concerted across partners from Italy, Spain, Croatia, Greece, Cyprus, Portugal, Slovenia, and Malta. Main output of the project was the creation of Blue Energy Labs (BEL) in each participating region. BELs included local enterprises, public authorities, knowledge institutions and citizens and, they constitute the basis to support future blue energy policies and plan concrete strategies for blue growth.¹⁹¹

BLUE DEAL project: Is born to capitalize results of MAESTRALE and PELAGOS projects. It aims to increase transnational activities of innovative clusters and networks of the BE sector, develop links and synergies between SME's, public authorities, knowledge institutions and civil society and establish transnational and regional Blue Deal Alliances. This project is showing how to reach a thorough assessment able to produce a blue energy deployment plan in a certain area. Linking it with open innovation actions, BLUE DEAL will make possible to envision a development of the MED area that will rely also on blue energies.¹⁹²

EWP-EDF One Wave Energy Project: Aims for the installation of ten floaters for the 'EWP-EDF One' wave energy project in the Port of Jaffa in Israel. The works will include cement works for the breakwater's reinforcement, and the installation of ten floaters on 30-metre-long pre-existing breakwater within the port. The floaters will have a combined installed capacity of 100kW.¹⁹³

186 Depellegrin et al., (2019). Exploring Multi-Use potentials in the Euro-Mediterranean sea space. *Science of The Total Environment* 653: 612-629.

Available at: <https://doi.org/10.1016/j.scitotenv.2018.10.308>

187 <http://be-cluster.eu/>

188 PELAGOS Project. Available at: <https://pelagos.interreg-med.eu/>

189 Soukissian et al., (2019) Marine Renewable Energy Clustering in the Mediterranean Sea: The Case of PELAGOS Project. *Frontiers in Energy Research* 7: 16. Available at: <https://www.frontiersin.org/article/10.3389/fenrg.2019.00016>

190 PELAGOS Project. Available at: <https://pelagos.interreg-med.eu/>

191 MAESTRALE Project. Available at: <https://maestrale.interreg-med.eu/>

192 BLUE DEAL Project. Available at: <https://blue-deal.interreg-med.eu/>

193 Eco Wave Power- EDF One' wave energy Project: Available at: <https://www.ecowavepower.com/israel/>

EMPLOYMENT

Trends

- ▶ Exponential increase in job creation across the different markets and technologies

Skills

- ▶ Technical and professional skills needed in sustainable energy production sectors, eco-jobs, design & planning; energy policy analysis; energy economics and consulting; R&D, etc.

Youth & Women

- ▶ Young professionals more keen to move to renewables sector's employment opportunities
- ▶ Various opportunities for digitalized and sustainable aware youth
- ▶ Yet, women continue to face barriers to recruitment and job retention in a still male-dominated energy industry

The development of the sector could bring huge economic benefits as it has the potential for creating 400,000 European jobs by 2050.¹⁹⁴⁻¹⁹⁵

Based on a study carried out by the International Renewable Energy Agency (IRENA), the Global Wind Energy Council (GWEC) (2020), estimates that 17.3 direct full-time jobs are created per each MW of generation capacity, over the 25-year lifetime of an offshore wind project.¹⁹⁶

Taking steps towards a fully sustainable energy transition would bring major economic benefits, including energy independence and opportunities for growth and employment – since the installation, operation and maintenance of these plants offers valuable opportunities for the local labour force.¹⁹⁷

At the same time, the development of the sector has the potential for resulting in direct positive impacts on employment¹⁹⁸ for local and large-scale economic sectors (construction, electrical and mechanical engineering, manufacturing activities, marine transport, professional services for the assembling procedures and accommodation services). These are all activities likely to be positively impacted during the construction, operation and decommissioning of energy plants.

Similarly, operations of such energy plants would lead to indirect benefits on the local economies benefitting from cheaper and more reliable sources of energy.¹⁹⁹

The development of the sector would also require innovative infrastructures and components that are capable of enduring the severe marine environmental stresses, making facilities less prone to faults and more cost-efficient as well as guaranteeing their continued operation. Other related-sectors – such as marine construction, shipbuilding and electric power system design and operation – would also indirectly envisage invaluable opportunities for growth, as they can re-adapt technological solutions developed in different contexts and partly re-orient their business and capitalize their experience.²⁰⁰⁻²⁰¹⁻²⁰²

As such, the sector offers a wide range of employment opportunities, for which fully trained staff is needed, both at the technical and professional levels.

As a result, it is necessary that a wide range of relevant knowledge and skills is necessarily are developed in order to promote and implement new methods of sustainable energy production.

¹⁹⁴ Ocean Energy Europe. Available at: <https://www.oceanenergy-europe.eu/ocean-energy/>

¹⁹⁵ Ibid.

¹⁹⁶ https://gwec.net/wp-content/uploads/dlm_uploads/2020/08/GWEC-offshore-wind-2020-5.pdf

¹⁹⁷ <https://medblueeconomyplatform.org/wp-content/uploads/2020/10/file-library-537056f329410ec71b48.pdf>

¹⁹⁸ Ibid.

¹⁹⁹ Pisacane et al., (2018) Marine Energy Exploitation in the Mediterranean Region: Steps Forward and Challenges. *Frontiers in Energy Research* 6: 109. Available at: <https://www.frontiersin.org/article/10.3389/fenrg.2018.00109>

²⁰⁰ Ellabban et al., 2014. Available at: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full#B27>

²⁰¹ Magagna and Uihlein, 2015a,b Available at: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full#B54>

²⁰² Borthwick, 2016. Available at: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full#B7>

Young professionals, particularly millennial (born in the 1980s to mid-1990s), are increasingly choosing careers based on social/environmental impact criteria. Thereby, they are drawn to the renewable energy sector rather than fossil fuel-based industries.

However, career advancement opportunities in the renewable energy industry are still not gender-equitable and women continue to face barriers to recruitment and job retention.

Furthermore, professionals working in male-dominated fossil fuel-based industries tend to be more informed about changes taking place in the industry as well as opportunities to move into the renewable energy sector.

As a result, women are less likely to benefit from job creation in this field.²⁰³

Expected job opportunities in renewable energy will therefore potentially cover a wide range of areas:

- Design and planning
- Energy policy analysis and development
- Energy economics and energy management
- Energy efficiency consulting progress
- Assessment of social and environmental impacts of energy systems
- Research and development

The growth of the renewable energy industry is therefore expected to bring tremendous job creation to new and existing markets.

Thus, the dividends of this growth should be distributed equally. But such potential would require the full support of businesses across the sector as well as the set-up of proactive programs and policies that address potential unequal access to career development opportunities.²⁰⁴⁻²⁰⁵

The development of the sector would also bring new opportunities for re-skilling the labour force of other related maritime industries.²⁰⁶

Both large enterprises and SMEs could in fact acquire new skills and capabilities by cooperating with cutting-edge research, confirming and enhancing their capacity of offering innovative, high-value solutions.

Academic researchers would largely benefit from the ability of established private firms to stay in a competitive market and thereby consolidate partnerships for the industrial roll-out of their concepts.²⁰⁷⁻²⁰⁸

To give an outline of the variety of potentially connected sectors, either in the supply chain or in research and development, it is here worth considering the following companies and businesses (see box 15).

203 IRENA (2020) Wind Energy: A gender perspective. Available at: <https://www.irena.org/publications/2020/Jan/Wind-energy-A-gender-perspective>

204 IEA (2020), Renewables 2020, IEA, Paris. Available at: <https://www.iea.org/reports/renewables-2020>

205 IRENA (2020) Wind Energy: A gender perspective. Available at: <https://www.irena.org/publications/2020/Jan/Wind-energy-A-gender-perspective>

206 Ibid.

207 Appleyard, 2017: <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full#B1>

208 European Commission, 17c : <https://www.frontiersin.org/articles/10.3389/fenrg.2018.00109/full#B34>

BOX 15 MRE Job Opportunity Areas

The Oil & Gas sector and the Shipyard & Shipbuilding industry: Specialized in the construction of drilling platforms, floating platforms and offshore supply and cable laying vessels, and capable of delivering the economic assessment of the different phases in the lifetime of a floating structure, from construction to deployment.

Companies providing cost effective solutions for onshore construction as well as hands-on experience in all areas of offshore geotechnics: Typical projects include offshore platforms, subsea structures, pipelines, floating structures, whose feasibility study is accompanied by quantitative risk assessments covering the full range of marine installation, and including the hydrodynamic and sea-keeping analysis of floating units, their mooring analysis, ship handling/manoeuvring simulations, and the analysis of mechanical components.

The electronics industry: Offering innovative energy storage solutions and batteries for marine offshore applications.

Companies specialized in the design and production of electro submersible pumps and turbines, whose performance under variable flow conditions is crucial in the low-energy wave conditions typical of the Mediterranean Sea.

Manufacturing companies: Offering bearings, ball screws, etc.

Companies providing innovative and durable materials for submerged structures: E.g., new coatings and alloys).

Companies developing unmanned underwater robotics: for the monitoring and surveillance of the infrastructures at sea.

Companies offering integrated cable-less communication solutions: For the Internet Of Underwater Things (IOUT), which open new possibilities for the installation and monitoring of infrastructures.

MARITIME SAFETY AND SECURITY



INTRODUCTION

Maritime safety and security have become a key transnational issue in the Mediterranean area. This is due to the encompassment of safety, security and environmental issues – all pivotal aspects in a sustainable economic development.

Effective coastguard functions are critical to assure a safe and secure Mediterranean region. Yet these functions face relevant challenges, including the need to detect marine and coastal threats as early as possible.

As a result of the different needs of maritime safety and security, a number of opportunities now exist for the development and innovation across the sector. In brief, examples include the development of training activities, as well as the exchange of information, expertise, technical assistance, training and best practices to address knowledge sharing across the region.

New markets for the applications of innovative technologies also exist and should be fully exploited in the future, as a way to develop common approaches to tackle enduring complex issues such as climate change and the support of spatial planning (MSP/ICZM) for achieving a safe/secure blue economy.



OVERVIEW

Due to its valuable ecosystem as well as its social and economic assets, the Mediterranean region is facing a persisting number of complex maritime threats (socio-economic, environmental and climatic) which are affecting the safety and the security of the region.²⁰⁹

Furthermore, the development of a thriving blue economy in the Mediterranean is at the same time both causing and being affected by such threats.

On the one hand, the sustainable development of certain blue economy activities is still (e.g. transport, tourism, renewable energy, aquaculture and fisheries)²¹⁰⁻²¹¹ is negatively affecting the safety and security of the region (pollution, spread of diseases, ecosystem deterioration, illegal and unreported fishing, etc.).²¹²

On the other hand, the future sustainability of these activities (in terms of long-term jobs and growth) is threatened by a number of external factors (climate change, migrations, lack of effective maritime and coastal spatial planning, etc.).²¹³

Recognising the importance of maritime safety and security is therefore essential to assure sustainable economic growth across the Mediterranean region, as well as for the overall wellbeing and stability of the region. Coastguard cooperation has the potential to serve as a pillar of integration for the Mediterranean. In this sense, the latest UfM Ministerial Declaration on Sustainable Blue Economy²¹⁴ already recognised the importance of ensuring a high level of maritime safety and security throughout the Mediterranean Sea basin. This is not only for the protection of citizens and Countries, but also for the development of a sustainable blue economy.

At the same time, the Conventions of the International Maritime Organization (IMO), calls for enhancing the capacity to prevent and react against manmade and natural disasters, as well as pollution from ships, in cooperation and within the agreed legal framework, with relevant regional organisations, and through regional institutions.²¹⁵

In this respect, the United Nations Environment Programme (UNEP) and the Mediterranean Action Plan (MAP) Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) which was set with the objective of preventing and reducing pollution from ships and promptly prevent marine pollution spills.²¹⁶

At the same time, there is not a single security-system so far which is covering the entire Mediterranean region, as each Country has its own.

For example, in the EU, each Member State (MS) has its own Maritime Surveillance System, building on sovereignty principles and exclusive competence of EU MS. In this context, and to favour greater regional cooperation, the EU has developed a series of coordination tools aimed to improve surveillance and intervention capacities at transnational level.

In this respect, the Common Information Sharing Environment (CISE) is a reference tool for multilevel governance systems.

Initiated in 2014, the CISE is being developed jointly by the European Commission and EU/EEA Member States. It integrates existing surveillance systems and networks and gives all concerned authorities access to the information they need for their missions at sea.²¹⁷

209 <https://governance.interreg-med.eu/no-cache/news-events/news/detail/actualites/increasing-safety-and-security-in-the-mediterranean-sea/>

210 Seiti, E-C (2017). Integrating maritime security operations in the Mediterranean. CIMSEC- Center for International Maritime Security. Available at: <https://cimsec.org/integrating-maritime-security-operations-in-the-mediterranean/>

211 Merritt, G (2011). A Security & Defence Agenda (SDA) Discussion Paper: Maritime security in the Mediterranean: Challenges and policy responses. Available at: https://www.files.ethz.ch/isn/130716/Maritime_Discussion_Paper_FINAL.pdf

212 <https://www.efpia.eu/about-medicines/development-of-medicines/regulations-safety-supply/environment-health-safety-and-sustainability/>

213 <https://www.eesc.europa.eu/en/our-work/opinions-information-reports/information-reports/sustainable-development-mediterranean-region-information-report>

214 <https://ufmsecretariat.org/ufm-ministerial-conference-blue-economy/> & <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

215 <https://www.imo.org/en/OurWork/Security/Pages/GuideMaritimeSecurityDefault.aspx>

216 REMPEC Website: <https://www.rempec.org/en>

217 https://ec.europa.eu/maritimeaffairs/press/cise-common-information-sharing-environment-new-era-maritime-surveillance_en

FUTURE (2021-2030)

Regional systems, as they stand today, cannot address all relevant challenges for a safe and secure region (pressures of diversified activities at sea and the necessity to consider migration, environmental risks and protection, environment and climate change).²¹⁸

It is therefore essential to re-conciliate the complex and fragmented aims and purposes of Maritime Surveillance as well as to strengthen key enabling infrastructures (material and immaterial) with more sophisticated and advanced technologies and surveillance systems.

Furthermore, the global climate and environmental challenges are a significant threat multiplier and a source of instability that will reshape geopolitics, including global economic, trade and security interests. Future activities will be essential to increase climate and environmental resilience, while preventing conflict, food insecurity, population displacement and forced migration.

There is a need to approach a simplification of data as a systematic concern as well as a need to move towards a data management strategy which better aligns the supply and demand side of data services (providers with users) .

Strengthening our joint capabilities to protect the marine environment, mitigate climate change and rise to new challenges

An effective maritime safety and security management would need from the implementation of a maritime surveillance system both at national and transnational level, tackling its different dimensions while also contributing to the European Green Deal objectives and the United Nation's 2030 Agenda for Sustainable Development Goals (SDGs).

Cooperation, collaboration and coordination

At the same time, a better cooperation and multi-governance approach is needed in the future so as to tackle complex issues (i.e climate change resilience, prevention and management), be able to provide better decision-support-systems (DSS) and allow for a better interpretation, management and decision-making processes based on latest available data.

Data Management Strategy

The guarantee for improving the efficiency and response of existing systems²¹⁹ is a better sharing and management of information and data between different institutional levels, the involvement of public and private bodies, universities, local authorities and citizens through their digital transformation.

During the COVID-19 crisis, this was further evidenced as vessels, vessel owners and the maritime community rely on clear-headed, data-driven and reliable solutions, which facilitate their economic activity within this new reality.

BOX 16

Towards a data management strategy

A very large amount of data is produced regarding maritime activities, marine environment, or weather monitoring (maritime surface/underwater, air, remote-piloted air systems (RPAS), satellite, civil administration, military, leisure and tourism actors, marine research and monitoring, extraction, shipping industry, non-governmental organizations).²²⁰ As such, there is an urgent need for a Mediterranean backbone system as a reference for better exchange of information.

²¹⁸ <https://governance.interreg-med.eu/no-cache/news-events/news/detail/actualites/increasing-safety-and-security-in-the-mediterranean-sea/>

²¹⁹ Check the Blue Hub: R&D platform for maritime surveillance and maritime situational awareness. Available at: <https://bluehub.jrc.ec.europa.eu/>

²²⁰ Interreg Mediterranean. PANORAMED Governance Platform (2020). Policy Paper on Maritime Surveillances: Implementation of multilevel governance in Maritime Surveillance. Available at: https://governance.interreg-med.eu/fileadmin/user_upload/Sites/Governance/horizontal_project/Library/Deliverables/WP6-Maritime_surveillance/6-2-2_PANORAMED_-_KPP_Maritime_Surveillance.pdf

In the EU, for example, the promotion of a voluntary and decentralised framework for cooperation in multilevel maritime surveillance would be key to enlarge the range of services and approaches to be offered across the region.²²¹

In turn, this approach would bring added value and complementarity to existing maritime data systems, services and sharing processes, while avoiding duplication. Moreover, such multilevel implementation approach should be part of a more comprehensive information and exchange framework across the EU. Its implementation should work towards coherence within that framework.

In a more operational way, the EU initiative sets five key principles to ensure information exchange efficiency and sustainability: Transparency; Sustainability; Simplification; Calls for projects; Newcomers.

Efforts need to improve, encourage and ensure information exchange between public and private sectors within the existing (i.e. CISE, EUROSUR (FRONTEX), SAFESEANET (EMSA), VMS (EFCA), COPERNICUS (ESA), MARSUR (EDA), Maritime Single Window) or new frameworks.²²²

These tools constitute an overall framework that can be upgraded, developed and adapted – in order to improve the capacities and working conditions of actors involved in maritime activities (providers and users of marine data at EU, national, regional and local level).

Maritime surveillance should also be a support pillar for Maritime Spatial Planning (MSP) & Integrated Coastal Zone Management (ICZM). This is because surveillance systems can help MSP/ICZM to better manage conflict, promote multi-use and balancing the context-specific socio-ecological needs and economic opportunities.

Importantly, further opportunities for effective safety and surveillance services may also arise for space technologies to find new markets and applications as well as for other innovative technologies, such as unmanned and autonomous systems, artificial intelligence, 5G, cloud and edge computing, digitalization, monitoring, optimisation and interoperability.

BOX 17

4 guidelines for implementation of a voluntary and decentralised framework for multilevel maritime surveillance²²³

1. Integrate new technologies and services to develop the Blue Economy.
2. Move from information sharing to data sharing as a raw material allowing the emergence of multiple contexts/cross-sectorial knowledge.
3. Develop clusters from citizens up to EU/ Multinational institutions to build trust between different levels.
4. Overcome sectorial, transnational and multinational barriers to access to data and adapt decision making processes.

²²¹ Interreg Mediterranean. PANORAMED Governance Platform (2020). Policy Paper on Maritime Surveillances: Implementation of multilevel governance in Maritime Surveillance. Available at: https://governance.interreg-med.eu/fileadmin/user_upload/Sites/Governance/horizontal_project/Library/Deliverables/WP6-Maritime_surveillance/6-2-2_PANORAMED_-_KPP_Maritime_Surveillance.pdf

²²² EU has developed coordination tools to improve surveillance and intervention capacities at transnational level such as the Common Information Sharing Environment – CISE)

²²³ Interreg Mediterranean. PANORAMED Governance Platform (2020). Policy Paper on Maritime Surveillances: Implementation of multilevel governance in Maritime Surveillance. Available at: https://governance.interreg-med.eu/fileadmin/user_upload/Sites/Governance/horizontal_project/Library/Deliverables/WP6-Maritime_surveillance/6-2-2_PANORAMED_-_KPP_Maritime_Surveillance.pdf

EMPLOYMENT

Trends

- ▶ New markets and applications of technologies (unmanned and autonomous systems, AI, big data, etc.)

Skills

- ▶ Multidisciplinary approach required (e.g. ICT, management, mathematics, sociology, law)
- ▶ Soft skills required for validation processes, integration of various data sources, new applications of the data, cross-sectoral integration knowledge...

Youth & Women

- ▶ Various opportunities to newcomers (especially young)
- ▶ Still a male-driven sector with further efforts required to reduce gender gap

Various employment opportunities will emerge for business dealing with security, intelligence, services, environmental protection of natural resources, cyber-security, monitoring and innovative technologies. All of which are key to a sustainable economy.

Skills needed will include hard (technical and professional knowledge skills), but also soft skills (complementary skills) that are mandatory when dealing with complex and highly technological products.

This particularly concerns the validation processes ensuring the compliance of products with the regulatory frameworks (for shipping and offshore activities), which are defined internationally.

Soft skills needed for maritime safety and security would also include the capacity to better integrate various data sources and obtain added value from their analysis (content curators, data miners, data scientist, etc.).

Additionally, such soft skills concern the capacity to look beyond common applied fields to those where data was forged to new applications, multiple contexts and cross-sectorial knowledge.

Specific capacity building will be needed for the development of a professional development scheme for specific inspectors (i.e. sulphur Inspectors and Flag State Inspectors) as well as on delivering a wide portfolio of training courses.²²⁴

Opportunities will also arise for various disciplines and new related employment areas (informatics, mathematics, sociology, ecology, law, governance, patents, management, security, aquaculture, fisheries, geography, etc.).

Efforts should therefore be placed so as to improve high-level education and training courses aiming at spreading specialised tailored knowledge to the main actors dealing with “safety and security issues” in order to achieve the greatest multiplier effect, especially in terms of orienting young people towards maritime vocations.²²⁵

Further efforts for reducing gender gaps should also be put in place.²²⁶

Despite recent efforts to reduce gender gaps (for example within the landscape of maritime research), the safety and security sector largely still remains a male-driven sector.

²²⁴ EMSA 2021 Outlook Report. Available at: <http://www.emsa.europa.eu/publications/item/4336-emsa-outlook-2021.html>

²²⁵ Check ASSESS Project: Advanced skills in safety, environment and security at sea. Available at: <http://www.assess-project.com/>

²²⁶ Kitada et al., (2019) Empowering Women in the Maritime Community.

WMU Journal of Maritime Affairs 18: 525–530. Available at: <https://link.springer.com/article/10.1007/s13437-019-00188-6>

BOX 18 Maritime safety and security initiatives

MED OSMoSiS	This project focuses on developing modules for Maritime Surveillance and information exchanges in the Mediterranean Sea and Atlantic approaches. The project will explore the application of current guidelines and capabilities of the ongoing evolution of the CISE data exchange model. Regarding Maritime surveillance aspects 14 new functionalities will be developed and four pilot studies will be performed. ²²⁷
SAFEMED	<p>This initiative is implemented by the European Maritime Safety Agency (EMSA), and aimed at providing technical assistance in the sector by bringing together national, European and international stakeholders – with the aim to raise the safety, security and protection of marine environment standards.²²⁸</p> <p>Countries involved in the project include Algeria, Egypt, Jordan, Israel, Libya, Lebanon, Morocco, Palestine and Tunisia.</p> <p>In each country a Focal Point is leading the operations, as part of the activity of relevant national institutions.²²⁹</p> <p>As part of this project, a relevant initiative is the Mediterranean Coast Guard Functions Forum (MedCGFF), aimed at enhancing the regional cooperation around maritime issues of mutual importance and of common interest.²³⁰</p>
MedCGFF	<p>Mediterranean Coast Guard Functions Forum (MCGFF) was established to enhance cooperation among Mediterranean Littoral States Coast Guard Agencies with the initiative of Italy and the first meeting was held in Genova/Italy in 2009.</p> <p>It is a non-binding, non-political and independent platform composed of 24 Mediterranean countries. The MCGFF, bringing together the representatives of competent organizations and institutions which engage in coast guard activities in the Mediterranean, primarily aims at developing potential partnerships and enhancing cooperation among member states to conduct activities in many fields ranging from maritime security and safety to environment protection.</p> <p>The Forum also seeks common solutions to the challenges that the member states might face.</p>

²²⁷ MED OSMOSIS project website: <https://med-osmosis.interreg-med.eu/>

²²⁸ SAFEMED IV Project Website: <http://emsa.europa.eu/we-do/assistance/training/safemed-iv.html>

²²⁹ <http://emsa.europa.eu/focal-points.html>

²³⁰ <http://www.emsa.europa.eu/tags/105-safemed-iv-c7-mediterranean-coast-guard-functions-forum.html>

Cross-Cutting

Themes in the

Mediterranean Sea



MARINE LITTER



INTRODUCTION

The Mediterranean Sea is often described as one of the areas in the world most affected areas by marine litter.²³¹

There is increasing evidence on the amount, composition and distribution of marine litter in the Mediterranean Sea basin, as research efforts multiply to tackle this critical issue. Nevertheless, challenges to evaluate the impact of marine litter in the region persist, given that information is currently fragmented.²³²⁻²³³

The global production of plastics has been growing exponentially since 1960s and there are already huge quantities of marine litter in the oceans and seas. It is estimated that plastics and microplastics account for 70-90% of the total composition of marine litter in this sea basin.²³⁴

According to WWF, over half a million tonnes of plastic are released into Mediterranean waters every year, which is equivalent to 33,800 plastic bottles thrown into the sea every minute.²³⁵

At the same time, approximately 62 million macro-litter items are estimated to be floating on the surface of the entire Mediterranean basin.²³⁶

The latest International Union for Conservation of Nature (IUCN, 2020) report²³⁷ estimated that the total plastic accumulated at the sea surface in the Mediterranean Sea is estimated in the order of magnitude of 1,178,000 tonnes, with a possible range from 53,500 to 3,546,700 tonnes (only at sea surface which constitutes less than 0.1% of the total stock).

This study also estimated a central annual plastic leakage of 229,000 tonnes (low and high leakage estimates equate to 150,000 and 610,000 tonnes year⁻¹ respectively), of which 94% are macroplastics and 6% are microplastics.



231 UNEP (2015) Marine Litter Assessment in the Mediterranean 2015. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/7098/MarineLitterEng.pdf>

232 Zambianchi et al., (2014) Marine litter in the Mediterranean Sea: an oceanographic perspective. 10.13140/RG.2.1.2315.3760. Available at: https://www.researchgate.net/publication/270049954_Marine_litter_in_the_Mediterranean_Sea_an_oceanographic_perspective/citation/download

233 <https://www.medqsr.org/ci-22-results-and-status-including-trends>

234 PANACeA (2019) Knowledge and tools to manage the impact of marine litter in Mediterranean Marine Protected Areas (MPAs). State of play and challenges ahead. Available at: https://biodiversity-protection.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/horizontal_project/News_events/Panacea_report_Marlice_final_v5.pdf

235 Dalberg Advisors, WWF Mediterranean Marine Initiative (2019) Stop the Flood of Plastic: How Mediterranean countries can save their sea. Available at: https://awsassets.panda.org/downloads/a4_plastics_reg_low.pdf

236 Suaria & Aliani (2014). Floating debris in the Mediterranean Sea. Marine Pollution Bulletin. 86: 494-504. 10.1016/j.marpolbul.2014.06.025

237 Boucher, J. & Bilard, G. (2020). The Mediterranean: Mare plasticum. Gland, Switzerland: IUCN. x+62 pp. Available at: <https://portals.iucn.org/library/sites/library/files/documents/2020-030-En.pdf>

Figure 11 Plastic stock, reflecting 10 years of sampling across the Mediterranean Sea



reflecting 10 years of sampling across the Mediterranean Sea, compared to the annual plastic leakage from the watersheds considered in this study. The accumulated stock is in the same order of magnitude as approximately 10 years of leakage. Source: Boucher, J. & Bilard, G. (2020). *The Mediterranean: Mare plasticum*. Gland, Switzerland: IUCN. x+62 pp. Available at: <https://portals.iucn.org/library/sites/library/files/documents/2020-030-En.pdf>

OVERVIEW

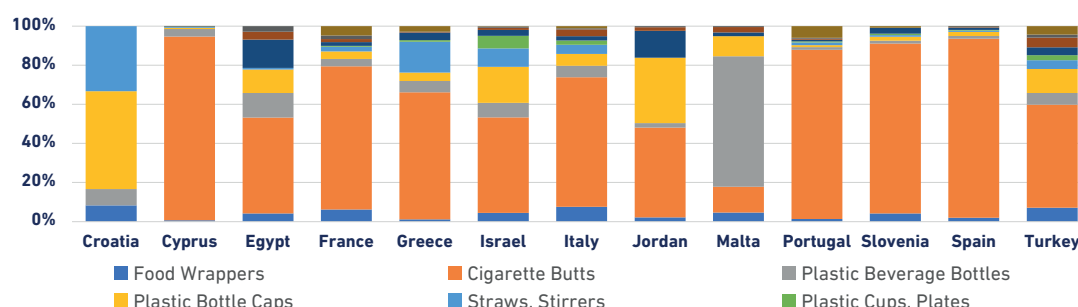
The International Coastal Cleanup (ICC) report (2020) has shown cigarette butts are the most frequently found litter item in Mediterranean coastlines and beaches.²³⁸

Based on a study conducted on 28 Mediterranean sites, the average litter density in beaches and protected areas was estimated to be 1048 items/100m.²³⁹

Concerning the distribution of floating marine litter, higher concentrations have been detected in the Ligurian Sea, Sardinian-Balearic basin and Central Tyrrhenian Sea, especially during the warmer seasons.²⁴⁰

The modelling of how floating marine litter drifts has also shown that most contaminated areas are the Sicilian sub-basin, the Catalan Sea, the Po River Delta area and the Venice Lagoon.²⁴¹

Figure 12 Top 10 marine litter items collected in the Mediterranean Sea



source: Top 10 litter items collected in beach and coastal cleanup events along 2019 at the Mediterranean Sea Countries. Source: Own, based on the International Coastal Cleanup (2020) Report. Available at https://oceanconservancy.org/wp-content/uploads/2020/09/2020-Report_-FINAL.pdf. Note: No data was gathered for Albania, Algeria, Bosnia and Herzegovina, Lebanon, Libya, Monaco, Montenegro, Morocco, Palestine, Syria and Tunisia.

²³⁸ Ocean Conservancy (2020) International Coastal Cleanup report 2020. Available at: https://oceanconservancy.org/wp-content/uploads/2020/10/FINAL_2020ICC_Report.pdf

²³⁹ Iachogianni (2019) Marine Litter in Mediterranean coastal and marine protected areas – How bad is it. A snapshot assessment report on the amounts, composition and sources of marine litter found on beaches, Interreg Med ACT4LITTER & MIO-ECSDE. Available at: https://mio-ecsde.org/wp-content/uploads/2019/02/SHOT-ASSESSMENT-OF-ML-IN-MED-MPAs_final.pdf

²⁴⁰ Bibagli et al (2019) Tackling Marine Litter in the Mediterranean: Knowledge & Tools, Interreg MED Biodiversity Protection Community. Available at: <http://panaceaweb.adabyron.uma.es/download/66/panacea/862/report-tackling-marine-litter-in-the-mediterranean-knowledge-and-tools.pdf>

²⁴¹ Ibid.

Challenges & Opportunities

One of the main challenges arises when evaluating the impact of marine litter in the Mediterranean region, given that information is currently fragmented.

In order to achieve a clear understanding of the problem and better articulate these evaluations, the latest IUCN (2020) report²⁴² divided the Mediterranean Sea into five different compartments (see figure 13)

Another challenge of managing marine litter lies in determining the source of pollution, as this can happen directly or indirectly through intentional or unintentional pathways (e.g. through waste water outlets, waste mismanagement, littering, dumping, etc.).

Litter introduction can be direct, from ships or other activities at sea, as well as from coastal or inland sources and then transported by rivers to the sea.²⁴³

However, the main sources of marine litter include poorly managed urban waste management facilities. The Mediterranean region accounts for some of the largest amounts of Municipal Solid Waste generated annually per person (208– 760 kg/Year) and has insufficient waste processing infrastructure.²⁴⁴

Intense waste generating economic activities such as tourism and intense fishing, including commercial and recreational fishing and aquaculture farms, further increase this waste generation pressure onto the Mediterranean Sea.²⁴⁵

The International Maritime Organisation (IMO) established an Action Plan addressing marine litter and developed a “Comprehensive Manual on Port Reception Facilities” which provides guidance on the provision of port reception facilities for ship-generated waste.²⁴⁶

However, better managed port reception²⁴⁷ facilities for waste collection and recycling are needed along our Mediterranean coasts, particularly as countries should improve port reception facilities to ensure proper collection and recycling of waste coming from all maritime activities.

Rivers are also important pathways through which marine litter enters the coastal and marine environment.²⁴⁸ Moreover, the semi-closed Mediterranean basin favours accumulation of litter to a greater degree than in the open oceans.²⁴⁹

Figure 13 Key environmental compartments for marine litter



Source: by Boucher, J. & Bilard, G. (2020). *The Mediterranean: Mare plasticum*. Gland, Switzerland: IUCN. x+62 pp. Available at: <https://portals.iucn.org/library/sites/library/files/documents/2020-030-En.pdf>

242 Boucher, J. & Bilard, G. (2020). *The Mediterranean: Mare plasticum*. Gland, Switzerland: IUCN. x+62 pp. Available at: <https://portals.iucn.org/library/sites/library/files/documents/2020-030-En.pdf>

243 European Commission (2020). *The EU Blue Economy Report*. 2020. Publications Office of the European Union. Luxembourg. Available at: https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf

244 UNEP (2015) *Marine Litter Assessment in the Mediterranean 2015*. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/7098/MarineLitterEng.pdf> <https://wedocs.unep.org/bitstream/handle/20.500.11822/7098/MarineLitterEng.pdf?sequence=1&isAllowed=y>

245 Vlachogianni (2019) *Marine Litter in Mediterranean coastal and marine protected areas – How bad is it. A snapshot assessment report on the amounts, composition and sources of marine litter found on beaches*, Interreg Med ACT4LITTER & MIO-ECSDE. Available at: https://mio-ecsde.org/wp-content/uploads/2019/02/SHOT-ASSESSMENT-OF-ML-IN-MED-MPAs_final.pdf

246 MARPOL – How to do it, Manual on the practical implications of ratifying, implementing and enforcing MARPOL 73/78, 2002 Edition (First published in 1993), International Maritime Organisation, London, 2003; IMO sale number IA636E; ISBN: 92-801-4152-X.

247 *Comprehensive Manual on Port Reception Facilities*, 1999 Edition (First published in 1995), International Maritime Organisation, London, 1999, IMO Sales number IMO-597E; ISBN 92-801-6094-X.

248 Bibagli et al (2019) *Tackling Marine Litter in the Mediterranean: Knowledge & Tools*, Interreg MED Biodiversity Protection Community. Available at: https://planbleu.org/sites/default/files/upload/files/panacea_ML_policy_report_20190408.pdf

249 UNEP (2015) *Marine Litter Assessment in the Mediterranean 2015*. Available at: <https://wedocs.unep.org/bitstream/handle/20.500.11822/7098/MarineLitterEng.pdf> <https://wedocs.unep.org/bitstream/handle/20.500.11822/7098/MarineLitterEng.pdf?sequence=1&isAllowed=y>

FUTURE (2021-2030)

The Mediterranean Sea is considered as one of the most important biodiversity hotspots in the world, hosting 7.5-9% of global marine biodiversity.²⁵⁰⁻²⁵¹

Mediterranean ecosystems are increasingly threatened by direct and indirect anthropogenic pressures, such as pollution (including marine litter), intensive fishing activities, maritime transport and climate change. These are the main factors causing loss of biodiversity, habitat destruction, eutrophication, and the introduction of non-native species.²⁵²

There is a growing evidence of global marine ecosystems being impacted by marine litter as a result of our unsustainable lifestyles associated with the 'plastic' revolution.²⁵³

As such, marine litter is at present perceived as a major menace to the conservation and sustainability of marine biodiversity as well as healthy and functional ecosystems, partly due to its wide distribution.²⁵⁴

The way litter pollution is affecting marine life at different scales is not fully understood yet.²⁵⁵

However, there is growing literature on its impact on marine species, with most available studies conducted on demersal (32.9%), pelagic (27.7%) species, followed by benthic (14.7%), benthopelagic (16.5%), neritic (5.3%) and mesopelagic (2.9%).²⁵⁶

Ingestion, entanglement, colonisation and rafting are among the most common risks for marine life.²⁵⁷

A recent study found that 116 different species ingested plastic, 44 species were found entangled in marine litter and 178 were found rafting on floating objects or using marine litter as a substratum in the Mediterranean Sea.²⁵⁸

Furthermore, marine litter will cause major economic impacts due to its effects on certain Blue Economy sectors (i.e. tourism, fisheries, etc.).

250 Angiolillo M and Fortibuoni T (2020) Impacts of Marine Litter on Mediterranean Reef Systems: From Shallow to Deep Waters. *Front. Mar. Sci.* 7:581966. doi: 10.3389/fmars.2020.581966. Available at: <https://www.frontiersin.org/articles/10.3389/fmars.2020.581966/full>

251 UfM Secretariat (2017) Bioindicator Selection in the Strategies for Monitoring Marine Litter in the Mediterranean Sea. Available at: https://ufmsecretariat.org/wp-content/uploads/2018/01/Bioindicator-Selection-in-the-Strategies-for-Monitoring-Marine-Litter-in-the-Mediterranean-SEA_UfM-Report-November-2017_print.pdf

252 Bibagli, E. et al (2019) Tackling Marine Litter in the Mediterranean: Knowledge & Tools, Interreg MED Biodiversity Protection Community. Available at: https://planbleu.org/sites/default/files/upload/files/panacea_ML_policy_report_20190408.pdf

253 ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc.uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

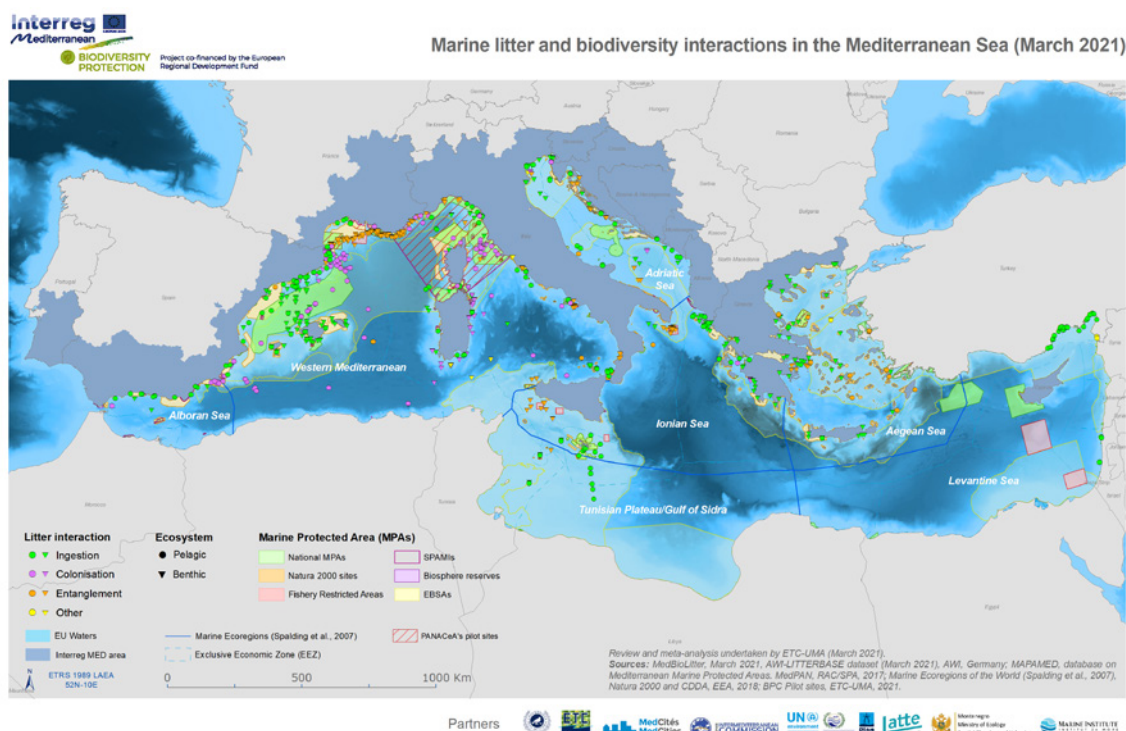
254 Angiolillo M and Fortibuoni T (2020) Impacts of Marine Litter on Mediterranean Reef Systems: From Shallow to Deep Waters. *Front. Mar. Sci.* 7:581966. doi: 10.3389/fmars.2020.581966. Available at: <https://www.frontiersin.org/articles/10.3389/fmars.2020.581966/full>

255 ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc.uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

256 SCP/RAC (2019) 25 Solutions innovantes et motivantes pour lutter contre les déchets marins plastiques dans la région Méditerranéenne. Available at: <http://www.cprac.org/es/archivo-de-noticias/genericas/25-soluciones-innovantes-pour-lutter-contre-les-dechets-plastiques-mari>

257 PANACeA (2019) Knowledge and tools to manage the impact of marine litter in Mediterranean Marine Protected Areas (MPAs). State of play and challenges ahead. Available at: https://biodiversity-protection.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/horizontal_project/News_events/Panacea_report_Marlice_final_v5.pdf

258 Anastasopoulou and Fortibuoni (2019). Impact of plastic pollution on marine life in the Mediterranean Sea, in: *Handbook of Environmental Chemistry*, eds F. Stock, G. Reifferscheid, N. Brennholt, and E. Kostiania (Cham: Springer), 1–12. Available at: https://link.springer.com/chapter/10.1007%2F698_2019_421

Figure 14 Biodiversity interactions with marine litter

Source: Carlos Guitart (ETC-UMA), Dania Abdul Malak (ETC-UMA), Antonio Sánchez (ETC-UMA), Carolina Pérez Valverde (MedCities), Emanuele Bigagli (Independent Consultant, MedCities), Sonsoles San Román (ETCUMA). Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project, 2019. | Knowledgebase: <https://cica-esri.maps.arcgis.com/apps/dashboards/670e73343bc645ef9a8b10da0aab8542>

As an example, UN Environment estimated the total natural capital cost to marine ecosystems from plastic littering damage to be at \$13 billion per year globally.²⁵⁹

Looking at the main opportunities for tackling marine litter in the future, there is a need to increase knowledge and information regarding the topic (i.e. marine litter, circular economy efforts, sustainable consumption and production efforts, legal actions, social actions and infrastructure and economic actions around marine litter lead the way).

Increased, long-term information and reliable knowledge base on marine litter and its impacts on biodiversity and humans for the whole Mediterranean

The way litter pollution (from macro down to micro and nano scales) is affecting marine life is not fully understood yet, especially beyond short spatial and temporal scales. Such studies need to be urgently prioritised to enable the understanding of potential future scenarios and to support finding solutions to guarantee functional marine ecosystems, and so the provision of proper ecosystem services.²⁶⁰

Circular economy efforts & Sustainable consumption & production efforts

The EU Circular Economy Action Plan envisages that, by 2030, all plastic packaging within the EU market will be either reusable or recyclable.²⁶¹

As such, circular economy policies and practices could be key to solving the marine litter problem, given its potential to retain waste within the economy; regaining the value embodied in plastics that leaked out of the economy as waste; and continuing efforts for recovering litter already discharged in the oceans.²⁶²

This, in conjunction with optimising landfill management, will help to substantially reduce the amount of those plastics most likely to end up as marine plastic litter.

Together with measures to tighten the management of marine based sources of marine litter, and with clean-up operations where feasible, increased plastic pollution of oceans may be stemmed and eventually prevented.²⁶³

²⁵⁹ UNEP. (2014). Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry

²⁶⁰ ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc-uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

²⁶¹ European Commission (2020) New Circular Economy Action Plan for a cleaner and more competitive Europe. Available at: https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

²⁶² UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

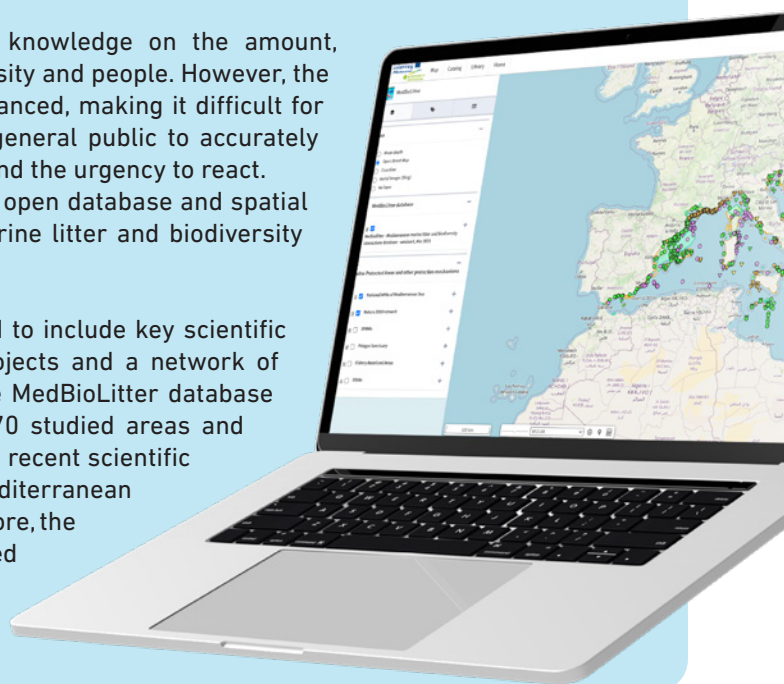
²⁶³ Ibid

BOX 19 MedBioLitter: an open database on marine litter and biodiversity science

Research efforts on marine litter are increasing our knowledge on the amount, composition and impacts on marine ecosystems, biodiversity and people. However, the number of studies is scattered and geographically unbalanced, making it difficult for policy makers, managers, the business sector and the general public to accurately understand the dimensions of such a modern challenge and the urgency to react.

The [PANACeA project](#) has developed the [MedBioLitter](#), an open database and spatial geoportal on current scientific knowledge related to marine litter and biodiversity interactions in the Mediterranean region.

The MedBioLitter thematic database is regularly updated to include key scientific findings by the Interreg Med Biodiversity Protection projects and a network of partner institutions active on marine litter research. The MedBioLitter database includes, in addition to the geolocation of more than 470 studied areas and species, direct access to more than 100 articles; the most recent scientific literature on marine litter and biodiversity in the Mediterranean including spatial data, metadata and authorship. Furthermore, the database includes a mechanism for any author interested to submit new information for analysis and inclusion in future updates (latest edition, version 6, Mar 2021).



Already at the product design stage, the following efforts might be considered:²⁶⁴

- a) Scrutinising the necessity of packaging altogether, including of plastics;
- b) Selection of renewable, bio-degradable and compostable materials and additives that are not or less toxic for essential plastic packaging or single-use plastic products;
- c) Designing for less material use to decrease waste;
- d) Designing packaging and products that use a single or small number of polymers that are easy to separate during recycling.

Policy measures to incentivise circular economy practices in design could consist of supporting implementation of innovations in design of existing and new products. Also, policies could be to support innovations and start-ups in particular related to new, biodegradable and compostable plastics.

Furthermore, there could additionally be support for development of effective infrastructure for collection and separation of waste streams to empower local authorities with sufficient financial and technical resources, which could induce product designs for ease of recyclability.²⁶⁵

In the service sectors, tourism and retail businesses as well as industrial laundries may be encouraged to implement circular economy practices. This could be in view of replacing single use packaging with durable and reusable packaging; substituting materials for packaging with renewable ones; implementing new business models that eliminate the need for packaging and single-use plastic products; and reducing and eliminating shedding of microfibers and microbeads into waste and waste water management systems.²⁶⁶

Opportunities for achieving circular economy may also come from Green Deal and Sustainable Blue Economy opportunities, especially in islands areas recognising the geographic constraints of islands and outermost regions).

²⁶⁴ UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

²⁶⁵ Ibid.

²⁶⁶ Ibid.

This is due to their challenges relating to insularity, making them particularly vulnerable to the threats posed by globalisation, demographic trends, climate change, and energy supply and, especially for the eastern areas, exposure to increasing migration flows.

Measures aiming at the reduction of marine litter are currently re-shaping industries related to production, use and disposal of items known to be a predominant part of marine litter.²⁶⁷

These include the production and use of single-use plastic and fishery related items, but also infrastructural measures, such as adjustment of port reception facilities and waste management logistics. While the use of bio-based materials and, under certain defined conditions “bio-degradable” materials, is being discussed, their use must be preceded by a thorough analysis of their impact not only on the environment, but also on related activities, e.g. in food production.²⁶⁸

In the production stage, design should be envisioned towards the Life Cycle, up-cycling and/or recycling of the products. As such, some measures could already prevent leakages of plastic raw materials and industrial plastic waste into the environment. These measures may include the strengthening management of plastic raw materials (to eliminate material losses into wastewater streams), as well as improving the resource productivity of manufacturing by implementing resource efficient cleaner production methods.²⁶⁹

In the use stage, suppliers as well as customers should be led towards choices supporting circular economy practices, in particular opting out of single-use plastic products, and supporting waste management systems that can collect, sort, separate and effectively recycle plastics.

At the end of the first life, products should have various directions to follow before becoming waste: reuse with or without repairs or refurbishment, recycling for secondary materials either for the same type of use; up-cycled to higher value uses or down-cycled to an alternative use. In a circular economy, waste recycling options are, or should be, the same for plastic packaging and short-lived, fast moving plastic product.

Legal Actions

Addressing marine pollution requires holistic and large scale policy frameworks at a regional, national and global level, due to the trans-boundary nature of pollution, spreading by air or ocean currents.²⁷⁰

This global and Mediterranean issue, and the managerial challenges arising from it, are the focus of governments and international organisations worldwide who are seeking to coordinate a global response to this common challenge.²⁷¹

Harmonised protocols for monitoring and assessing marine litter in the various marine compartments, its impacts on biodiversity as well as clearly defined baselines and targets to measure trends and progress, would also help fighting marine litter.²⁷²

The UN Environment/MAP Barcelona Convention was the first Regional Sea Programme to adopt a legally-binding Regional Plan on Marine Litter Management (2013). It is running an operational and collaborative platform to coordinate efforts at the basin scale as well as implementing the Integrated Monitoring and Assessment Program of the Mediterranean Sea and Coast (UN Environment/Barcelona Convention IMAP), including monitoring and assessment of marine litter (Ecological Objective 10).²⁷³

Furthermore, various Mediterranean countries have established National Action Plans or Programme Measures addressing the marine litter issue whilst others have adopted measures for the reduction in use of single-use plastic bags.²⁷⁴

267 Hanke G. et al (2019) EU. 2019. Directive on reduction of impact of certain plastics 2019/904/EU.

268 European Commission (2020). The EU Blue Economy Report. 2020. Publications Office of the European Union, Luxembourg. Available at: https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf

269 UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

270 European Commission (2020). The EU Blue Economy Report. 2020. Publications Office of the European Union, Luxembourg. Available at: https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf

271 ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc.uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

272 Hanke G. et al. (2019). EU Marine Beach Litter Baselines, EUR 30022 EN, Publications Office of the European Union, Luxembourg. ISBN 978-92-76-14243-0, doi:10.2760/16903

273 ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc.uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

274 <https://oceanconference.un.org/commitments/?id=19914>

The main legislative framework related to marine litter monitoring in European countries bordering the Northern part of the Mediterranean Sea is the EU Marine Strategy Framework Directive (MSFD) where marine litter is tackled through Descriptor 10 (D10) and other more recent policies, such as the European Strategy for Plastics in a Circular Economy or the 2020 Blue Manifesto.²⁷⁵⁻²⁷⁶

The MSFD requires that quantities or composition of marine litter do not cause harm to the coastal and marine environment. It has created the evidence basis for the adoption of the Directive on Single Use Plastics (SUP), which aims to reduce the impact on the marine environment from single use plastic products and from plastic fishing and aquaculture gear.

The SUP Directive as well as EU activities on microplastics are follow-up actions of the 2018 Strategy for Plastics adopted by the European Commission, which introduced an integrated approach to the production, use and environmental impacts from plastic and products containing it, including an international dimension.²⁷⁷

The latest UfM Ministerial Declaration on Sustainable Blue Economy²⁷⁸ already welcomed the progress in the implementation of the Regional Action Plan on marine litter management in the Mediterranean, the application of the Sustainable Consumption and Production approach as per the 2014 UfM Ministerial on Environment and Climate Change, and the following approval of the 2016 Regional Action Plan on Sustainable Consumption and Production (SCP) of the Barcelona Convention.

At the same Ministerial Declaration, ministers also welcomed the Barcelona Convention's COP 21 commitment to take urgent action to prevent plastic leakage in the Mediterranean Sea, by promoting prevention measures and circular approaches, and adopting national plans to progressively achieve 100% plastic waste collection and recycling, by 2025.



Photo by: Mariano Cebolla/ACT4LITTER

They also welcomed UfM Secretariat's support and actions to promote regional coordination and partnership on marine litter, possibly within a wider green, circular economy approach, in close cooperation with the Barcelona Convention Secretariat and many other relevant (international, regional, national and local) stakeholders and frameworks.

Social Actions

Consumers could also be encouraged to shift to business models based on product-as-service or sharing to extend the lifetime of the plastic products consumed. They could also reject products containing microbeads or that shed microfibers, but also apply retrofits to e.g. household washer/driers, which could filter out these microbeads/microfibers.²⁷⁹

Similarly, established consumption patterns, lifestyles and economic inertias could be challenged through the implementation of circular economy models where bulk consumers could deploy their purchasing power along circular use patterns.²⁸⁰⁻²⁸¹

Policies facilitating the proposed changes should be complemented by consumer education that starts at early ages for a future without plastic litter.²⁸²

²⁷⁵ Vlachogianni, Th. (2019) Marine Litter in Mediterranean coastal and marine protected areas – How bad is it. A snapshot assessment report on the amounts, composition and sources of marine litter found on beaches, Interreg Med ACT4LITTER & MIO-ECSDE. Available at: https://mio-ecsde.org/wp-content/uploads/2019/02/SHOT-ASSESSMENT-OF-ML-IN-MED-MPAs_final.pdf

²⁷⁶ 2020 Blue Manifesto. Available at: https://seas-at-risk.org/images/pdf/publications/SAR_BLUE_MANIFESTO_DEPLIANT_A4_plie_BaT.pdf

²⁷⁷ European Commission (2020). The EU Blue Economy Report. 2020. Publications Office of the European Union. Luxembourg. Available at: https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf

²⁷⁸ <https://ufmsecretariat.org/ufm-ministerial-conference-blue-economy/> & <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

²⁷⁹ UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

²⁸⁰ ETC-UMA (2019) Mediterranean biodiversity and marine litter: an interaction knowledge base, Interreg Med Biodiversity Protection project. Available at: http://www.etc.uma.es/wp-content/uploads/PAN_report_Mediterranean-biodiversity-and-marine-litter_LowRes.pdf

²⁸¹ UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

²⁸² Ibid.

Similarly, effective cross-border and cross-sector cooperation and coordination at the Mediterranean scale in the implementation of existing policies and promotion of best practices (i.e. fisheries, tourism, diving, etc.) would also help advancing towards the fight against marine litter. As regards to the reduction of marine litter generated by blue economy sectors, Ministers also called for an exchange of best practices to address the issue of marine litter from aquaculture and the issue of abandoned, lost or otherwise discarded fishing gear, in the framework of the General Fisheries Commission for the Mediterranean (GFCM).-UfM member countries were invited to engage with fishermen to involve them in the collection of marine litter at sea.²⁸³

User-awareness campaigns, the mobilisation of better awareness, scientific research and priority actions, as well as empowering managers with the necessary tools and knowledge, would also help tackling this problem.

Increasing awareness and concern on this issue by citizens, governments, international and national organizations could stimulate monitoring programs, scientific research and NGO activity in the Mediterranean (i.e retrieval of fishing gear in cooperation with fishermen, engaging with fishermen to involve them in the collection of marine litter at sea, etc.).²⁸⁴

In this regard, the latest UfM Ministerial Declaration on Sustainable Blue Economy²⁸⁵ already invited all UfM countries to develop further initiatives to raise public awareness on marine litter and address it, including micro-plastics, through actions that include among others marine litter monitoring and removal.

Infrastructures & Economic Actions

Actions supporting waste management systems that can collect, sort, separate and effectively recycle plastics (such as the improvement of waste management practices) would also help tackling marine litter. Similarly, business should continue its efforts to curtail virgin plastic use and increase plastic recycling to live up to their corporate social and environmental responsibilities.

Amongst potential economic actions to fight marine litter. These can be achieved through means such as the enforcement of bans for some and levies for other plastic products, enforcement and fees in cases of non-compliance, deposit return schemes for reducing single-use or short-lived plastic product use and eco labelling efforts.²⁸⁶

A number of initiatives could also trigger both supply side motivation for circular product designs and preference for such products on the demand side, such as measures for creating markets for recycled plastics and improving markets for bio-based plastics; differentiated taxes on virgin and recycled plastics; introduction of standards for recycled content; improving information on recycled content in products in combination with educational campaigns for consumers.²⁸⁷

Box 20 gathers a short sample of some of the initiatives and projects tackling marine litter in the Mediterranean Sea.

283 UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

284 Angiolillo & Fortibuoni (2020) Impacts of Marine Litter on Mediterranean Reef Systems: From Shallow to Deep Waters. *Front. Mar. Sci.* 7:581966. Available at: <https://www.frontiersin.org/articles/10.3389/fmars.2020.581966/full#B36>

285 <https://ufmsecretariat.org/ufm-ministerial-conference-blue-economy/> & <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

286 UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

287 UNIDO (2019) Addressing the challenge of Marine Plastic Litter Using Circular Economy. Available at: https://www.unido.org/sites/default/files/files/2019-06/UNIDO_Addressing_the_challenge_of_Marine_Plastic_Litter_Using_Circular_Economy_0.pdf

BOX 20 Maritime safety and security initiatives

ACT4LITTER	Aims to fill some of the gaps identified by marine protected area (MPA) managers to tackle marine litter pressures increasingly affecting protected areas in the Mediterranean Sea. The initiative gathered, reviewed, and shortlisted a set of effective transferable measures that can be implemented by MPA managers to tackle the problem of marine litter on site.
MEDSEALITTER	Analysed the ingestion of plastics by several marine species including fishes, the loggerhead turtle, bogues and Polychaeta (marine annelid worms).
PANACeA	Has now become the Mediterranean Biodiversity Protection Community project (2019-2022) to move forward networking and management efforts inside and outside protected areas (PAs), and so enhance nature conservation and management in the region.
PLASTIC BUSTERS MPAs	Provides a comprehensive, multifaceted and coordinated approach to fight marine litter in Mediterranean coastal and marine protected areas towards healthy marine ecosystems. It does so by addressing the entire litter-management cycle, developing ML monitoring protocols and running mitigation actions.
COMMON	Aims to apply the Integrated Coastal Zone Management (IZCM) principles to the challenge of marine litter.
BLUEMED Pilot Action	Aims to promote the circulation of good practices, R&I actions, but also demonstrations, communication and education actions specifically addressed to face the challenges posed by marine litter.

EMPLOYMENT

New employment opportunities may arise around the topics of plastic waste management, marine litter prevention, circular economy, marine litter and micro-plastics consultancy, product and packaging designer; circular investment specialist; reverse logistics manager; product lifecycle manager, etc.

Judging by the corporate momentum toward circularity, the opportunities are only going to expand. Ultimately, the circular economy only reaches its world-changing potential once circularity-related work becomes understated and broadly understood as business as usual.

The circular niche will become the mainstream, and nobody will feel the need to spell it out as part of a job

function. However, that hasn't even happened yet with roles explicitly related to sustainability, which leaves plenty of opportunities to make progress.

With regards to circular economy, 3 typologies of jobs have been described:²⁸⁸

- "Core" circular jobs, including those that involve regenerative resources, extend the life of products and rethink business models.
- "Enabling" circular jobs, including designing for the future.
- "Indirectly" circular jobs, in education, government and professional services, all support the more core circular functions.

BOX 21 Knowledge and skills required

Knowledge-basis for potential new jobs related to marine litter

- Knowledge on Green procurement policies and processes;
- Knowledge of the International framework on marine litter from sea-based sources, especially the International Convention for the Prevention of Pollution from Ships (MARPOL);
- Knowledge of EU strategy regarding port reception facilities;
- Knowledge of policies related to circular economy, plastic and sustainable consumption and production;
- Insight into the functioning of the EU institutions and their framework related to circular economy and marine litter.

Skills and capacity for potential new jobs related to marine litter

- Capacity to establish dialogue and cooperation amongst relevant marine stakeholders e.g. on environment, fisheries and industry, concerning plastic production and management;
- Capacity for implementing the waste hierarchy, extending it to the producer responsibility, and supporting deposit return schemes for plastic products and plastic waste;
- Enhancing and/or suggesting activities for implementing a sustainable consumption and production of plastic;
- Supporting efforts for the reduction of litter from sea-based sources;
- Capacity to raise awareness of public authorities and consumers about sustainable consumption and production of plastic and impacts on the environment of littering.

²⁸⁸ Circle Economy (2018) Arming the workforce for a circular revolution: Skills and labour in a circular economy. Available at: <https://www.circle-economy.com/news/arming-the-workforce-for-a-circular-revolution-skills-and-labour-in-a-circular-economy>

MARINE RESEARCH & INNOVATION



INTRODUCTION

Research and innovation are essential drivers for the sustainable blue economy in the Mediterranean region.

A wide range of initiatives exist to support greater research and innovation capacity across the two shores of the region.

Yet, disparities persist, both in the southern and the northern shores as well as across different sectors in the blue economy.

To be fully effective and impactful, research and innovation should reflect on the specific needs and challenges of the blue economy sectors, while transforming those into real opportunities for local areas.

Increasing the collection and dissemination of robust scientific evidence across the Mediterranean region is thereby an essential prerequisite for a smart and sustainable development of the blue economy.



Photo source: http://www.bluedmed-initiative.eu/wp-content/uploads/2018/11/IMG_1925.jpg

CROSS-CUTTING THEMES

OVERVIEW

A wide range of policy actions have been promoted throughout the past decade, with the aim to support greater research and innovation capacity in the field of the blue economy across the two shores of the Mediterranean region. A sample of relevant initiatives and platforms is presented in this section, allowing for greater innovation in the region.²⁸⁹

Policy initiatives and stakeholder platforms

The role of the European Commission has been essential in fostering some relevant initiatives aimed at increasing research and innovation capacity in the region. For example, the Blue Med Initiative was launched in 2014 and endorsed by the Union for the Mediterranean (UfM) in 2017, as part of the Valletta Declaration.

Furthermore, to support a sustainable blue economy across the seabasin, a common Strategic Research and Innovation Agenda (SRIA) for the Mediterranean was agreed in 2018.²⁹⁰

The agenda has allowed to set a number main challenges, knowledge gaps and enabling activities to be addressed as well as relevant response measures for capacity creation and skills' enhancement.

An additional Implementation Plan has also been drafted in June 2020,²⁹¹ resulting from the priorities provided by each Mediterranean country. This addresses a number of structural challenges for a sustainable blue economy across the seabasin.

Thematic groups are active across a number of pivotal areas²⁹² (policy, knowledge, economy, technology) and allow for the participation of relevant national representatives. In this context, in February 2021,²⁹³ a conference was organised to present the main achievements so far and the challenges ahead.

Figure 15 BlueMED Mediterranean top priorities for Research and Innovation



Source: [BlueMED website](https://www.bluedmed-initiative.eu/)

²⁸⁹ <http://www.bluedmed-initiative.eu/about-the-bluedmed-initiative/>

²⁹⁰ http://www.bluedmed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf

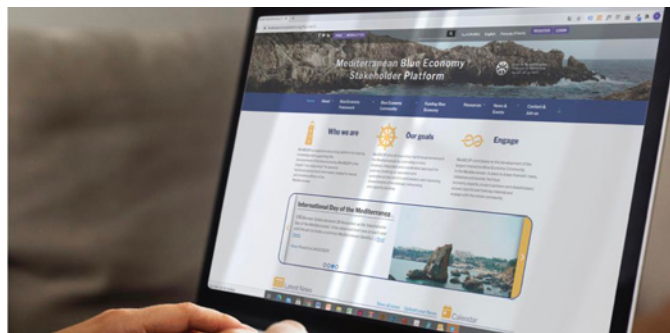
²⁹¹ http://www.bluedmed-initiative.eu/wp-content/uploads/2020/07/bluedmed-preliminary-implementation-plan_version-complete.pdf

²⁹² <http://www.bluedmed-initiative.eu/about-the-bluedmed-initiative/#organization>

²⁹³ <http://www.bluedmed-initiative.eu/bluedmed-final-conference/>

A critical infrastructure for the coordination of actions and exchange of practices amongst regional stakeholders is the [Mediterranean Blue Economy Stakeholders Platform](https://medblueeconomyplatform.org/#gsc.tab=0).²⁹⁴

The initiative is the largest “one-stop-shop” for general, technical and sectoral information related to marine and maritime affairs in the Mediterranean.



Implemented by the UfM Secretariat, the platform is a regional networking tool which enables the sharing of knowledge amongst regional practitioners (researchers, entrepreneurs, civil society actors, policymakers, etc.) and supports the development of a sustainable blue economy.

It therefore allows relevant actors across the region to work together across sectors and engage in sector-specific partnerships, to address gaps in access to knowledge and innovation, while also fostering a sustainable blue economy across the seabasin.²⁹⁵

Another essential initiative aimed at fostering regional research and innovation is the [Joint Programming Initiative Healthy and Productive Seas and Oceans \(JPI Oceans\)](https://www.jpi-oceans.eu), established in 2011.²⁹⁶

Acting as an intergovernmental platform, open to all EU Member States and Associated Countries who invest in marine and maritime research, the initiative identifies strategic Joint Actions aimed to implement the Mediterranean Strategic Research and Innovation Agenda (SRIA).

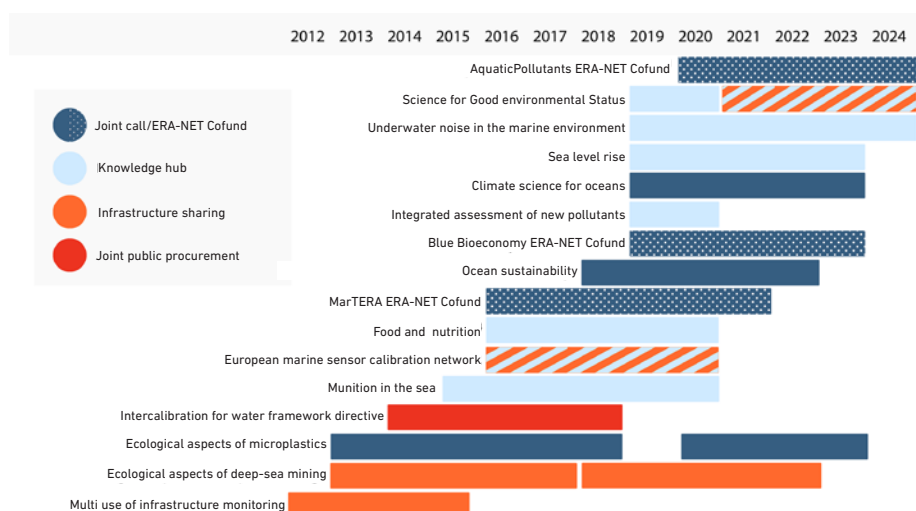
The size, scope and methods identified for each action vary depending on the research needs and the objectives to be achieved.²⁹⁷

A new strategic framework is currently being launched, aiming to refresh the current framework and providing the building blocks for a coherent and successful pathway beyond 2020.²⁹⁸

SEMED is also an important digital platform aimed at connecting innovation ecosystems and create innovation partnership opportunities.²⁹⁹

By joining SEMED, innovators can find the connections and resources they need, share opportunities and knowledge across the network and grow partnerships and further opportunities for businesses and across local ecosystems.

Figure 16 JPI Oceans Joint Actions to solve the Strategic research and Innovation Agenda



Source: <https://www.jpi-oceans.eu/joint-actions-0>

²⁹⁴ <https://medblueeconomyplatform.org/#gsc.tab=0>

²⁹⁵ <https://medblueeconomyplatform.org/blue-economy-community/>

²⁹⁶ <https://www.jpi-oceans.eu>

²⁹⁷ <https://www.jpi-oceans.eu/joint-actions-0>

²⁹⁸ <http://jpi-oceans.eu/draft-strategy-framework-beyond-2020>

²⁹⁹ <https://semed.eu/search?q=join%20us>

The Copernicus Marine Service is an open platform offering access to satellite data and allowing all Mediterranean stakeholders. This access is to a range of enabling data-related services which are related to marine policy and scientific innovation.³⁰⁰

Services offered include data provisioning, monitoring and reporting services as well as visualisation of trends and forecasts based on a wide range of available maritime and scientific indicators.³⁰¹

Data is collected from satellite accounts, direct ocean sampling and numerical models for the global oceans including the Mediterranean.

Furthermore, Ocean Monitoring Indicators (OMIs) are available as well as an extensive scientific report published periodically with over 30 institutions and over 100 scientists.³⁰²

Observations and forecasts produced by the service support all marine sectors, both for service development but also for effective improvement in policymaking. These include policy areas such as marine safety, management of marine resources, coastal and marine environment as well as weather, seasonal forecasting and climate.³⁰³

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EU's integrated maritime policy.³⁰⁴

These organisations work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products.

A series of 'Seabasin Checkpoints' were established to assess how findable, accessible, interoperable and re-usable marine data are in all European seabasins, starting with the Mediterranean and North Sea since 2013.

The EMODnet Data Ingestion Portal was launched in 2017. It takes a pro-active and strategic approach to target datasets that can fill key gaps by reaching out to other initiatives, or, specific communities that are collecting data but who do not traditionally share their data, such as the private sector.

Relevant actors and bodies for innovation

In addition to the previous initiatives and platforms discussed, the role of **Maritime Clusters** should be highlighted.

Clusters are typically structured as organisations of interconnected companies, associated institutions, research bodies, etc.³⁰⁵ As such, they are becoming increasingly relevant actors in an effective innovation ecosystem across the Mediterranean and are key players in developing a fully sustainable blue economy in the region.

They are also essential drivers for the uptake of sustainable innovation by businesses and other stakeholders in essential areas for the development of the blue economy in the Mediterranean.

To do so, they tend to play an important role in the engagement with sustainable public and private investors, which are increasingly interested in financing innovative and appealing sustainable enterprises.

Figure 17 Distribution of maritime clusters across the Med to solve the Strategic research and Innovation Agenda

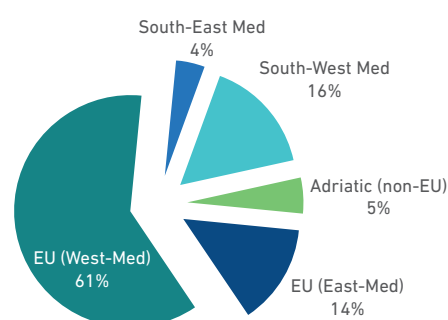
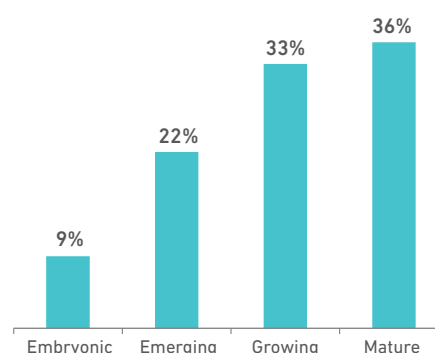


Figure 18 Distribution of maritime clusters across size



Source (figures 17/18): Maritime Clusters in the Mediterranean Region (UFM 2019)

300 <https://www.copernicus.eu/en>

301 <https://www.copernicus.eu/en/copernicus-services/marine>

302 <https://marine.copernicus.eu/access-data/ocean-monitoring-indicators>

303 <https://www.copernicus.eu/en/copernicus-services/marine>

304 <https://emodnet.eu/en/what-emodnet>

305 https://ufmsecretariat.org/wp-content/uploads/2019/12/Maritime-Clusters-in-the-Mediterranean-Region_Dec-2019.pdf

Universities and research centres are also pivotal actors in promoting research and innovation in the region. In this respect **UNIMED, the Mediterranean Universities Union**, has played a pivotal role in bringing together 130 Universities from 23 countries across the Mediterranean region.³⁰⁶

In an essential effort for accelerating sustainable innovation, UNIMED's mission is to develop research and education in the Euro-Mediterranean area to promote scientific, cultural, social and economic cooperation in different scientific fields across the region.

In acting as a 'university without walls', UNIMED promotes capacity development through internationality and mobility, plans fund-raising activities, supports quality assurance in education, including events and training.

Through its many initiatives carried out over two decades, UNIMED has become a point of reference for international university cooperation and in response to the challenges facing the Mediterranean region.

In particular, UNIMED has supported the southern Mediterranean countries, including through thematic subnetworks (transport and logistics, climate, tourism, natural resources, etc.).³⁰⁷ In this regard, it has had a focus on youth and women entrepreneurship as well as on fostering university incubators across the region.³⁰⁸

Investment in research and innovation so far has proven to play a significant role in pursuing an innovative and truly sustainable in the blue economy on both shores of the Mediterranean.

³⁰⁶ <https://www.uni-med.net/en/about-us/>

³⁰⁷ <https://www.uni-med.net/tag/subnetwork/>

³⁰⁸ <https://ufmsecretariat.org/reinforcing-innovation-employability-nexus-mediterranean-new-handbook/>

FUTURE (2021-2030)

Research and innovation is playing an increasingly vital role for developing a sustainable blue economy for the region in the future, while partnerships and cooperation between academia, industries and governments have become pivotal enablers.

In order to deliver on these expectations, universities and research institutes have to be highly responsive, adaptable, strategically directed, autonomously governed, and fully interlinked with regional partners and international networks.

It is also essential to allow for greater cooperation between academia, industry and government to power innovation and employability.

In this regard, the priorities for innovation and research for the blue economy in the Mediterranean set by the Blue Med Strategic Research and Innovation Agenda (SRIA) should serve as a guidance.

Sectors of interest include: ecosystems, climate change, biotechnologies, aquaculture, fisheries, tourism, shipbuilding, transportation, observing systems, data, off-shore platforms, cultural heritage and spatial planning.

And yet, in order to accelerate the transfer of innovation from research towards blue economy businesses, boundaries between different spheres are increasingly fading, giving rise to a system of synergetic actions to be further accelerated in the future:

- Universities and research centres are the source of new knowledge and technology;
- Industry businesses operates as the centre of production;
- Governments provide an enabling environment (e.g. providing incentives, autonomy and stability);
- Civil society and the third sector catalyse local interests and pursue effective supply of services and innovation at the grassroot levels, while voicing local needs.

Industry will have to further contribute through more ambitious commitment to sustainable innovation and collaborative research.

This will be possible by offering employment opportunities to young and skilled researchers and innovators, while participating in curriculum development to make such position stably embedded in the Mediterranean blue economy enterprises of the future.

However, policymakers will still have a pivotal role to play, notably in improving the regulatory and policy environment. Also, effective incentives for both academia and industry are critical to facilitate a collaborative and innovative sustainable blue economy development across the Mediterranean.

A collective push is required to reinforce the future 'innovation-employability nexus' in the Mediterranean. This push should be provided collectively by all actors, females and males, being them policymakers/authorities, entrepreneurs, researcher or member of the civil society.³⁰⁹

309 <https://ufmsecretariat.org/reinforcing-innovation-employability-nexus-mediterranean-new-handbook/>

MARITIME SKILLS, CAREERS AND EMPLOYMENT



INTRODUCTION

An acceleration of jobs across all blue economy sectors has been visible throughout the past decade – with some relevant sectors such as transport, fisheries, as well as tourism representing the largest share of the market, but also with interesting developments in aquaculture and energy for example.

Grounded on the relevant role of fisheries and tourism, particularly for the southern Mediterranean shore, in fact, employment opportunities have recently grown in the area of marine aquaculture, with (largely unassessed) potentials remaining in emerging sectors such as blue-biotech and marine renewable energies. The potential therefore exists for a wide range of new employment and career opportunities both in the north and southern shores of the Mediterranean. In order to support a fully sustainable blue economy,

importantly, a wide range of innovative skillsets are essential in the Mediterranean region. Training and education support is therefore needed across maritime-related professions in order to support technological developments and address environmental challenges.

Targeted educational and employment policies should carefully reflect on sub-sectoral as well as regional specificities, if they aim to be fully effective as a means to ensure greater career opportunities and quality jobs in the blue economy across the region. Importantly, many training and educational networks and tools are already available, but they should be further promoted and shared across the region and its different actors.

Particularly, a mismatch still persists between the skills of the labour force and the evolving needs of the various blue economy activities.

Effective employment and career support therefore requires great cooperation through decentralised approaches, across all ranges of local and regional actors (quadruple helix involving public, private, research and third-sector stakeholders). This is an area where policy support is needed to even existing practices.



OVERVIEW

The blue economy is a vital component of the Mediterranean business ecosystem, and as such represents a growing portion of jobs and professional careers across the region.

As documented in this report, the two main employers for the sector are clearly coastal and maritime tourism and fisheries, with also a relevant number of professionals employed in maritime transport and other various port activities.

And yet, substantial potentials for group creation and innovative career-path are emerging in a number of less prominent but certainly highly innovative areas, such as sustainable marine aquaculture, blue biotechnologies, and marine renewable energies. Although currently prominent on the northern Mediterranean shore – as documented in the specific sections of this report – those emerging areas have also a potential for job generation in the southern shore.

Furthermore, innovative new technologies can allow for relevant job opportunities across the region, hence providing a pathway for greater access for youth and women to fulfilling their careers within the sector.

When young workers, graduates and researchers, are unable to find decent job opportunities – be it in their countries or the wider region in general – they risk to entering a status of under- or full un-employment. In this context, moving to another country offering opportunities becomes a natural choice, therefore contributing to the migration of a skilled workforce (brain drain).³¹⁰

An overview of the main challenges and opportunities across relevant blue economy activities is provided in box 16. Note that further details on jobs/career opportunities, including for youth and women, as well as specific skills needs for each sector can be found in the specific sections of this report.

Importantly, the regional **UfM Seminar on blue skills, careers, jobs**³¹¹ (held on the 19 November 2019, in Brussels) revealed a number of pivotal aspects for the promotion of valuable jobs and career-path in the region.

The event highlighted that a variety of strategies and tools for blue career development are already in place in the Mediterranean. As such, they can be further adopted across the region if properly tailored to the specific needs of sectors and local actors in each country.

Amongst those, the **BlueSkills project aimed at promoting opportunities for marine and maritime career**³¹² – by developing skills, exchanging knowledge and valorising research for a more sustainable Mediterranean region.

Its aim is to develop new curricula and increase employability in the marine and maritime sectors. By supporting the Euro-Mediterranean communities of the Blue Economy stakeholders through higher education, research and innovation, the project will enhance the shared knowledge of the Mediterranean Region.

Other important projects and initiatives that have taken place in the Mediterranean region include the **Deep Blue Project**, the **BlueMED Initiative**, the **EMSEA Med**, the **High Opportunity for Mediterranean Executive Recruitment (HOMERe) Programme**, the **Mediterranean New Chance (MedNC) project** or the **Mediterranean Initiative for Jobs (Med4Jobs) project** (see box 23).

³¹⁰ https://ufmsecretariat.org/wp-content/uploads/2020/12/UfM_Handbook_Innovation-Employability-Nexus_2020_for-online-_20201210.pdf

³¹¹ <https://medblueconomyplatform.org/wp-content/uploads/2020/12/SeminaronBlueskillsCareersandJobs19November2019.pdf>

³¹² <https://ufmsecretariat.org/project/blueskills-blue-jobs/>

BOX 22 Overview of specificities in skill needs
and career potentials across sectors in the Mediterranean

BLUE ECONOMY ACTIVITY	PERFORMANCE	SKILLS NEEDS AND CAREERS	YOUTH AND WOMEN
Tourism	Persisting activity (need of support to push full sustainability)	<ul style="list-style-type: none"> ► Wide range of hard (certification, technical competencies, etc.) and soft skills (languages, managerial abilities, etc.) need to foster sustainable development in the sector. A comprehensive skills-support strategy is needed. 	<ul style="list-style-type: none"> ► 54% employed in core activities are women ► Youth employment opportunities exist (new techs, innovation)
Marine renewable energy	Emerging activity (with valuable niches)	<ul style="list-style-type: none"> ► Technical and professional skills needed in sustainable energy production sectors, eco-jobs, design & planning; energy policy analysis; energy economics and consulting; R&D, etc. 4% employed in core activities are women 	<ul style="list-style-type: none"> ► Young professionals potentially attracted by the renewable sector and its employment opportunities ► Various opportunities for high-skilled youth/women ► Women face barriers to recruitment and job retention in a still male-dominated energy industry
Fisheries & Aquaculture	Persisting activity (fisheries) and growing activity (aquaculture) (i.e. diversification from fisheries to aquaculture)	<ul style="list-style-type: none"> ► Technical and professional skills needed in sustainable aquaculture/mariculture, design & planning ; circular economy implementation ► Greater skills needed for policymakers to establish effective coastal zones dedicated to aquaculture in the Mediterranean ► Overall know-how of small-scale businesses to be improved (including ability to engage with sustainable investors in the sector) 	<ul style="list-style-type: none"> ► Potentials for youth and women (full-time, part-time and seasonal employment) ► Women also play an important role in aquaculture, with their key contribution being in both small-scale and industrial fisheries at the processing and marketing stage
Safety & Security	Growing activity (niche for new careers)	<ul style="list-style-type: none"> ► Multi-disciplinarity (ICT, management, math, sociology, law, etc.) ► Soft skills for data validation processes, integration of various security data sources, new applications of security data, cross-sectoral integration of knowledge generated, etc. 	<ul style="list-style-type: none"> ► Various opportunities still to be defined for young professionals, as this is a relatively emerging sectors ► Still a male-driven sector with efforts needed to reduce gender gaps

BLUE ECONOMY ACTIVITY	PERFORMANCE	SKILLS NEEDS AND CAREERS	YOUTH AND WOMEN
Transport and ports	Established activity (greening as a booster)	<ul style="list-style-type: none"> ▶ Green ports as an emerging job opportunity ▶ Shortages in foreign trade, environment and sustainability, digitalisation and port logistic operations ▶ Managerial ability to redefine just-in-time models and re-define the current supply chains 	<ul style="list-style-type: none"> ▶ Enhance career-path for youth and women – good social conditions and attractive new positions ▶ High employability of youth in Logistic Port Communities
Research & innovation (transversal to sectors)	Growing activity (cross-cutting careers)	<ul style="list-style-type: none"> ▶ A wide range of new opportunities within and across traditional and newly emerging sectors 	<ul style="list-style-type: none"> ▶ An important area for employment of young researchers and women ▶ Advocacy for a litter-free economy can find an essential ally in youth across the region ▶ Niches for youth and women currently not active in the labour market.
Fighting marine litter (opportunity for valuable new jobs)	Persisting activity	<ul style="list-style-type: none"> ▶ Gather relevant cross-regional data on litter ▶ Litter-free solutions for businesses and start-ups ▶ Multi-stakeholder's engagement capacity 	<ul style="list-style-type: none"> ▶ Advocacy for a litter-free economy can find an essential ally in youth across the region ▶ Niches for youth and women currently not active in the labour market

Source: based on sections across this report

BOX 23 Maritime skills and careers initiatives

BlueSkills project	Promotes opportunities for “Blue” marine and maritime careers by developing skills, exchanging knowledge and valorising research for more sustainable Mediterranean Sea. ³¹³
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. ³¹⁴
BlueMED Initiative	Aims to advance 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. ³¹⁵
EMSEA Med	Is the Mediterranean branch of European Marine Science Educators Association formed at the #EMSEA15 Annual Conference in Crete in October 2015. ³¹⁶
HOMERe	High Opportunity for Mediterranean Executive RecruitmentPromotes internship mobility between Mediterranean countries, and is predominantly aimed at high-profile students in their last year of study before graduation. ³¹⁷
MedNC	Mediterranean New Chance Addresses the challenge of socio-professional integration of young people and, particularly, of NEETs, by mobilizing and strengthening cooperation among stakeholders from both rims of the Mediterranean, including second chance schools. ³¹⁸
Med4Jobs	Mediterranean Initiative for Jobs (Med4Jobs) project aims to help increase the employability of youth and women, close the gap between labour demand and supply, and foster a culture of entrepreneurship and private sector development. ³¹⁹

313 BlueSkills website: <https://ufmsecretariat.org/project/blueskills-blue-jobs/>

314 Deep Blue website: <https://deepblue.co.in/>

315 BlueMED Initiative website: <http://www.blued-med-initiative.eu/>

316 EMSEA Med website: <http://www.emsea.eu/info.php?pnum=15>

317 HOMERe Programme website: <https://ufmsecretariat.org/project/homere-high-opportunity-for-mediterranean-executive-recruitment/>

318 MedNC project website: <https://ufmsecretariat.org/project/mednc-new-chance-mediterranean-network/>

319 Med4Jobs project website: <https://ufmsecretariat.org/project/mediterranean-initiative-for-jobs-med4jobs/>

An important area of support to boost innovative blue economy skills and career development is the provision of services for coaching, mentoring and matchmaking for job seekers across industries.

Existing practices in some areas and blue economy sectors in the Mediterranean can be streamlined to the whole region and range of blue economy activities.

Furthermore, upskilling and reskilling of current workers in the blue economy are pivotal activities to rebalance blue career and skills across the Mediterranean region, both at the local and national levels.

Notably, an increase in growth and employment opportunities in the southern countries will have positive implications for the entire region.

Education and training providers need in this sense to respond timely to a constantly-changing range of needs across sectors and regions, by introducing greater multi-disciplinarity in future training offer.

Cross-cutting aspects should be introduced – including digitalisation, greening, soft- and technical-skills (including entrepreneurship, social media management and language ability), as well as statistics and maritime spatial planning.

‘Brain drain’ (i.e. the tendency of skilled individuals to leave places/countries of origins to move to foreign location where they can find more valuable jobs) is a major problem to be immediately addressed: better provisioning of skills and competences for the blue economy as a whole is one of the two sides of the coin in this relevant challenge – the other being the need for further investments to boost competitiveness and innovation of the sector, which provides a greater demand for qualified professionals.

Similarly, there is a lack of awareness/sensibilization tools about new professional careers (open days, high level orientation etc.) particularly targeting young professionals across gender (males and females).

An overview of the different conclusions by the UfM Regional seminar is provided in box 24.³²⁰

BOX 24 Conclusions from the 1st regional UfM seminar on Blue Skills, Careers and jobs 19-11-2019 Brussels

Propagate the use of the Med Blue Economy Platform (VKC) as a platform for exchange of information/pedagogic tools/projects and contact - smart specialization strategie	Work towards sharing and opening access to information and data on skills employment issues.	Enhance mobility programs and operational internships (i.e. OGS Deep Blue programme) and request to loosen eligibility and participation conditions to EU programmes that address skilling and careers (as in Erasmus+, Interreg, various EMFF, etc.).
Keep track of coaching/mentoring/matchmaking needs (i.e. Med4jobs Initiative , MENTOR project , MARINEM project).	Foster competences and skills on on digitalisation, environment, soft skills and technical skills, security, entrepreneurship, socio-economics, multi-disciplinary approaches, social media, languages, statistics, law and maritime spatial planning	Develop vocational skills in the Med: VET training as well as short term training/lifelong learning are required more than university degrees. In general, training that links directly to employers is needed
Raise awareness/sensibilisation tools about new professional careers (open days, high level orientation etc.).	Address the mismatch between the education curricula and skillset needed by the market.	Introduce more multi-disciplinarity approaches in the trainings.

³²⁰ <https://medblueeconomyplatform.org/wp-content/uploads/2020/12/SeminaronBlueskillsCareersandJobs19November2019.pdf>

An overview of the wide range of training and types is available across the EU shore of the Mediterranean – but potentially applicable also to the southern shore – is presented in box 25 as provided by the European MarineBoard,³²¹ to illustrate the options available to professionals.

BOX 25 Training typologies across graduate courses

TRAINING TYPE	TRAINING CONTENT	TRAINING CONDUCTED BY WHOM	POTENTIAL JOB MARKET	TRAINING FORMAT
Research-based University degree Courses (Bachelor, Masters, PhD)	Disciplinary and multidisciplinary scientific, curiosity-driven research training. Mostly requiring a research thesis.	University Staff with research and teaching duties	Scientific research, teaching, private sector, industry, science administration	Mostly full-time presence courses, incremented with e-learning
Maritime training for professionals vocational diploma courses	Shipbuilding and repair, operation, pilotage, maritime law, management of shipping affairs	Universities and institutes of further education	Maritime traffic and all aspects of the shipping and offshore industry	Presence teaching and distance learning
Engineering and technology degrees (Bachelor and Masters)	Maritime engineering, ocean engineering, naval architecture, hydrodynamics, marine technology	Technical universities and polytechnics	Engineers and technicians	Mostly full-time presence, work-based training, online and distance learning
Specialized sectorial diplomas, certified courses, vocational training courses (Diploma, Bachelor, Masters)	Sector-specific e.g. tourism management, aquaculture and fishing technology, Marine Protected Areas, marine resource management, marine insurance, coastal management	Industry and certified teaching institutes, (technical) universities, NGOs, profit-seeking and non-profit enterprises	Mid- and high-level management in the corresponding sector	Work-based learning, part and full-time, presence courses, distance learning, internships
In-house training of professionals diplomas and certificates	Technology, management and other skills defined per industry	External and internal professional trainers	Career-development within the industry, entry-level and add-on qualifications	Short, targeted offers

Source: European MarineBoard, *Training the 21st Century Marine Professional* (2018)

321 https://www.marineboard.eu/sites/marineboard.eu/files/public/publication/EMB_FSB2_2018_Web_v1.pdf

FUTURE (2021-2030)

There is more than one active agent involved in the process of building a healthy environment, for future careers in sustainable blue economy across the Mediterranean. Businesses, institutions, schools and training centres, as well as other relevant civil society actors are all pivotal actors.

As stated in the UfM Handbook for Academia, Industry and Policymakers,³²² a concerted effort to step-up dialogue on innovation and employability is therefore crucial to unlocking our region's true potential. The lack of communication between these two interdependent worlds, if left unchecked, can hamper employment and job creation.

Strengthening the nexus between innovation and employability is the key to contribute even further towards the sustainable development of our region. To do so, a full engagement of all concerned stakeholders is essential – higher-education institutions, businesses, ministries, intermediary institutions, or civil society associations.

A visualization of the interaction between academia-industry-government ('Triple Helix'), with the integration of civil society ('Quadruple Helix') and the effects of investment in education on sustainable development ('Quintuple Helix') is illustrated below (Source UfM³²³).

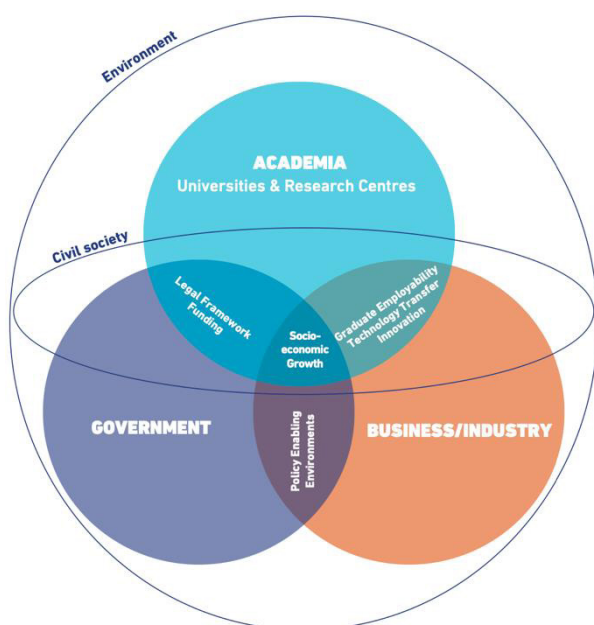
If we look ahead, great potentials emerge for further bridging and linking the two shores of the Mediterranean – so to leverage skills and competences.

New areas for proper training of public and private actors, as well as researchers, are to be addressed to anticipate transformative trends and promote just transitions.

For the industry, sector-specific partnerships will offer a means to develop and implement tailored strategies as a way to address skill gaps, including through public and private partnerships.

Furthermore, building on existing good practices across the region, it is possible to achieve further developments in vocational skills, short term training and lifelong learning.

Figure 19 Quintuple Helix



Source: UfM

³²² https://ufmsecreariat.org/wp-content/uploads/2020/12/UfM_Handbook_Innovation-Employability-Nexus_2020_for-online-_20201210.pdf
³²³ https://ufmsecreariat.org/wp-content/uploads/2020/12/UfM_Handbook_Innovation-Employability-Nexus_2020_for-online-_20201210.pdf

The Strategic Research and Innovation Agenda (SRIA)³²⁴ for the Mediterranean has identified for specific enablers to boost innovative skills and careers in the blue economy sector for the region.³²⁵

The first enables reflect the need to support the full access to data and information, so to boost knowledge in the region – this is an area with relevant consequences in employment for researchers and knowledge-related companies.

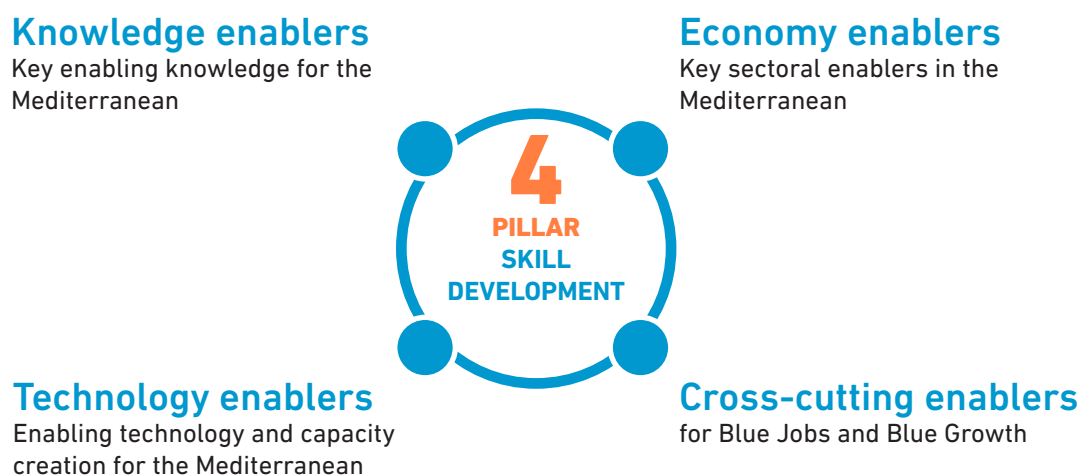
The second area reflect the need to support innovative businesses and new services and/or business models – hence providing an excellent opportunity for managers, innovators, business consultants and other professionals in this area.

Fostering enabling technologies and capacity creation is a further axis identified by the strategy – with clear employment and career potentials for engineers, technicians, applied researchers, etc.

Finally, and importantly, a number of key crosscutting enabling actions are identified be useful to facilitate the implementation process to assure effectiveness of Knowledge, Economy and Technology actions and their transfer the blue economy sectors and value chains. These are policy-driven enables and require policy decisions for their implementation.

In this regard, a valuable source of further insights is provided by the BLUEMED Implementation Plan,³²⁶ which outlines the most relevant mismatches to be addressed in the future to streamline the needs of the industry and the policy actions to be put in place for effective support to jobs and careers.

Figure 20 4-Pillar skill development



Source: [BLUEMED Strategic Research and Innovation Agenda 2018](#)

³²⁴ <http://www.bluedmed-initiative.eu/strategic-research-and-innovation-agenda/>

³²⁵ http://www.bluedmed-initiative.eu/wp-content/uploads/2018/12/BLUEMED-SRIA_Update_2018.pdf

³²⁶ <http://www.bluedmed-initiative.eu/wp-content/uploads/2020/07/bluedmed-preliminary-implementation-plan.pdf>

BOX 26 Matching policy and industry needs

Develop a **network of capacity-building and research centers** to train new professionals on sampling, recording and working at marine level for environmental, engineering and scientific studies.

Align high education curricula, establish **joint MSc, PhD programs, short term scientific exchanges**, to prepare the next generation of blue-economy scientists, technologist and entrepreneurs.

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.

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.

Improve Mediterranean **training centers and capabilities** to carry out projects that ensure safety in oil & gas offshore operations, including environmental risk and new technologies.

Develop **new modalities of training** security operators, exploiting the opportunities offered by the augmented reality technique.

Exploit **new digital technologies for training purposes**, with solutions based on Virtual Reality or Augmented Reality.

Promote capacity building to **increase resilience** of Mediterranean countries.

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

Source: BlueMed Implementation Plan³²⁷

³²⁷ <http://www.blued-med-initiative.eu/wp-content/uploads/2020/07/blued-med-preliminary-implementation-plan.pdf>

An aerial photograph of a large, powerful ocean wave. The water is a deep, vibrant blue-green color. The wave's surface is covered in intricate, swirling patterns of white foam and darker blue water, creating a textured appearance. The wave is moving from the top right towards the bottom left, with its crest beginning to curl. The lighting is bright, highlighting the white foam and the shimmering surface of the water.

SUSTAINABLE BLUE ECONOMY AS AN OPPORTUNITY

FINANCING SUSTAINABLE RESULTS

INTRODUCTION

Calls for fully sustainable financing (and investments) are increasingly emerging as an opportunity for the Mediterranean region. A wide array of public and private streams of finance are increasingly available.

These are both through regional and global initiatives addressing the blue economy as well as more broadly aiming to support climate change mitigation and adaptation across the sea basin. Globally, the blue economy generates over 2.5 trillion euros a year, making oceans the 7th largest economy in the world in terms of GDP.³²⁸

Across the Mediterranean, as this report shows, the blue economy sector as a whole is an essential driver for growth and jobs for the region. And yet, this source of wealth for individuals and businesses remains under threat from several human induced challenges, including over-fishing, pollution and environmental degradation, not to mention the effects of global climate change.³²⁹

If the current ecosystem threats are not urgently addressed, by 2030 one third of investments in the blue economy could be unsustainable – meaning approximately 250 billion euros would be invested in activities that are harmful for our oceans across the planet.³³⁰

Despite these concerns, there is a persistence of poor understanding or acceptance of the risks posed by business-as-usual investments.

This is in turn affecting the longer-term returns of economic and financial initiatives of the sector.³³¹ All these aspects are of particular relevance in the Mediterranean,³³² with negative implications for economic stability, the quality of its ecosystem, as well as access to food, health and overall security for regional livelihoods.

A wide range of funds and financing opportunities are nevertheless available for the next decade, in support of a sustainable blue economy in the Mediterranean.³³³ These should be fully optimised in order to address such challenges, by strengthening synergies between public grants and private investments, but also in order to address the different bottlenecks for a truly sustainable Mediterranean blue economy.



BLUE ECONOMY

328 <https://www.unepfi.org/wordpress/wp-content/uploads/2020/07/Sustainable-Blue-Economy-Flyer.pdf>

329 <https://www.credit-suisse.com/about-us-news/en/articles/news-and-expertise/ocean-preservation-and-sustainable-investing-202006.html>

330 <https://op.europa.eu/en/publication-detail/-/publication/2c390547-2a1b-11eb-9d7e-01aa75ed71a1/language-en/format-PDF/source-173288055>

331 <https://www.metabolic.nl/publications/value-at-risk-in-the-blue-economy-pdf/>

332 <https://www.unenvironment.org/news-and-stories/story/restoring-ecosystems-mediterranean>

333 <https://www.oecd-ilibrary.org/sites/bede6513-en/1/3/3/index.html?itemId=/content/publication/bede6513-en&csp=b7545bd11087d48c1bbc2341619b3830&itemIG0=oecd&itemContentType=book>

OVERVIEW

Sustainable public finance: transforming regional investments

Since 2018, the UN has actively worked to promote the implementation of SDG 14 (Life Below Water), and has set out ocean-specific standards, enabling the financial industry to mainstream sustainability of ocean-based sectors.

As a result, the Sustainable Blue Economy Finance Principles have been set-up as a 'gold standard' – the world's first global guiding framework for banks, insurers and investors to finance a sustainable blue economy.³³⁴

In this respect, the UN Environment Programme Finance Initiative (UNEP-FI) is supporting the Sustainable Blue Economy Finance Initiative,³³⁵ a UN-convened global community focused on the intersection between private finance and ocean health, supporting the implementation of the Sustainable Blue Economy Finance Principles.

As part of this initiative, a [practical guide](#) has been issued for financial institutions to lead a sustainable ocean recovery.³³⁶

This is an initiative closely related to the work of other International Organisation, such as the EU Commission and its action plan on financing sustainable growth,³³⁷ on the basis of which they have established an EU classification system for sustainable activities (EU taxonomy).³³⁸

This new approach will allow to coordinate all EU financing efforts towards a sustainable development, including for the blue economy in the Mediterranean.

In the Mediterranean region, the main sources of investments in the sustainable blue economy include public funding opportunities offered by International Organisations, governments, Multilateral Development Banks (MDBs) and "green funds". Such funding is offered in the form of grants or lending instruments aiming at co-financing of projects and providing support to infrastructure development and SMEs.

As a key example, the Environmental Fund for Mediterranean Marine Protected Areas (MedFund)³³⁹ aims at strengthening long-term financial sustainability of Marine Protected Areas (MPAs) through the establishment of a "trust fund", jointly managed by Mediterranean states and regional organisations (MedPAN, WWF-Mediterranean, IUCN-Mediterranean, among others).

In parallel, the private sector is showing a growing interest in sustainable investments through innovative financial instruments, such as "blue bonds".

The "Funding Blue Economy" section within the UfM Mediterranean Blue Economy Stakeholder Platform³⁴⁰ provides an overview of the organisations, initiatives, programmes, and specific calls promoting and financing the diversification and sustainable development of maritime economies in the Mediterranean.

There are also specific tools available such as the handbook for practitioners "Facilitating application procedures for Blue Economy project funding",³⁴¹ which offers step-by-step guidance and advice to access blue economy finance.

³³⁴ <https://www.unepfi.org/blue-finance/the-principles/>

³³⁵ <https://www.unepfi.org/blue-finance/>

³³⁶ <https://www.unepfi.org/publications/turning-the-tide/>

³³⁷ https://ec.europa.eu/info/publications/sustainable-finance-renewed-strategy_en

³³⁸ https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en

³³⁹ <https://ufmsecretariat.org/project/medfund/>

³⁴⁰ <https://medblueeconomyplatform.org/funding-blue-economy/>

³⁴¹ <https://medblueeconomyplatform.org/wp-content/uploads/2020/08/file-library-29ecee7fda97fabe077.pdf>

Public grants for a sustainable Blue Economy

A wide range of funding opportunities have been traditionally available in the EU.³⁴² However, new specific streams of funding are now targeting both northern and southern Mediterranean countries.

The EU Commission has recently planned to allocate unprecedented €1.8 trillion of funding to support recovery from COVID-19 pandemic and the EU's long-term priorities across different policy areas, including green and digital transitions.³⁴³

This support is aimed at EU countries, but also at neighbouring partners, particularly through the relaunch and strengthening the strategic partnership between the European Union and its Southern Neighbourhood partners.³⁴⁴

Accordingly, a 'new agenda for the Mediterranean'³⁴⁵ has been set in early 2021, through a Joint Communication calling for a green, digital, resilient and just recovery. This is guided by the 2030 Agenda for Sustainable Development, the Paris Agreement and the European Green Deal.³⁴⁶

In this framework, an unparalleled range of opportunities to finance blue economy projects in the Mediterranean emerge.

The Neighbourhood, Development and International Cooperation Instrument (NDICI) is the new EU financing instrument aimed to support such renewed regional partnership, amongst other funds.³⁴⁷ The instrument is based on regional pillars (of which neighbouring countries in the south and east is one) as well as thematic and rapid-response pillars.

The European Commission's budget proposal of May 2020 earmarks €86 billion* (in 2018 prices) for the entire NDICI geographic coverage (worldwide), including a top-up of €10.5 billion for the External Action Guarantee financed under the new EU Recovery Instrument, more than an 8% increase to the 2018 proposal.

The next **INTERREG EURO MED programme 2021-27**, for example, has a strong focus on the circular economy, enhancing biodiversity and reducing pollution. A consensus has been reached on the next programme's geographical coverage which is to expand its cooperation area by welcoming two new IPA countries (Bulgaria and the Republic of North Macedonia) and three new Spanish regions. The launch of the future Interreg MED Programme is expected in the second semester of 2021.³⁴⁸

In parallel, the new **"INTERREG NEXT programme"** on EU external borders will target neighbouring partner countries. The post-2020 Interreg NEXT programmes will be developed by partners from the eligible areas, based on the principles of partnership and ownership. Proposed provisions for financial allocations foresee that Interreg NEXT programmes will receive funding from NDICI and the European Regional Development Fund (ERDF).

A joint paper on Interreg NEXT Strategic Programming 2021-2027 was published in January 2020.³⁴⁹ It proposed a response strategy including new policy objectives based on those set for the European Structural and Investment Funds. Specific priority orientations for each of the five new geographic clusters have been established, including the Mediterranean Sea Basin.

The new EU Cohesion Policy also foresees the creation of an Interregional Innovation Investments Instrument, supporting investments and development of sustainable value chains in less developed regions.³⁵⁰ These aspects will be further clarified later this year, for instance through (potential) additional Communications by DG MARE.

With the implementation of the new 2021-2027 EU budget, the newly established European Climate, Infrastructure and Environment Executive Agency (CINEA), previously INEA, will support the implementation of the European Green Deal by managing relevant EU programmes, with a total budget of €52bn. Specifically, the new Agency will manage the European Maritime and Fisheries Fund (EMFF), the Life Programme, and to some extent Horizon 2020.

³⁴² https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/publications/brochure-eu-funding-opportunities-for-the-blue-economy-2014-2020_en.pdf

³⁴³ https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2073

³⁴⁴ https://ec.europa.eu/neighbourhood-enlargement/news_corner/news/southern-neighbourhood-eu-proposes-new-agenda-mediterranean_en

³⁴⁵ https://eeas.europa.eu/headquarters/headquarters-homepage/92844/joint-communication-southern-neighbourhood_en

³⁴⁶ https://eeas.europa.eu/sites/default/files/joint_communication_renewed_partnership_southern_neighbourhood.pdf

³⁴⁷ https://ec.europa.eu/international-partnerships/system/files/factsheet-mff-multiannual-financial-framework-v09_en.pdf

³⁴⁸ <https://interreg-med.eu/about-us/futureinterregmedprogramme/>

³⁴⁹ <http://kokoushallinta.ekliitto.fi/djulkaisu/kokous/2020293-5-1.PDF>

³⁵⁰ https://s3platform.jrc.ec.europa.eu/documents/20182/347039/02_Warsaw_VP_FINAL_June+2019.pdf/a75cee23-128c-4107-b1cf-53279a026dbb



The **European Maritime, Fisheries and Aquaculture Fund (EMFAF)**³⁵¹ has a simplified process to unlock its €6.108 billion budget for the period 2021-2027. The new EMFAF will focus on supporting small-scale coastal fisheries, promoting sustainable aquaculture by encouraging investments in the sector.

Furthermore, for the first time, it will also include provisions on international ocean governance and measures to respond to exceptional crises causing market disruptions. It will be encouraged to use the available funds to finance the replacement or modernisation of fishing fleets as well as to promote the generational renewal in the profession by supporting the acquisition of vessels by young professionals. EMFAF will co-finance projects by 70%.



Additionally, the renewed **Horizon Europe**,³⁵² partly inspired by the Apollo 11 mission to “put a man on the moon”,³⁵³ will incorporate five new research and innovation Missions.

These will operate as a portfolio of actions tackling major societal challenges through measurable and time-bound goals.

The mission “Healthy oceans, seas, coastal and inland waters” will support the development of solutions for the prevention and reduction of marine pollution, including plastics; the transition to a circular and blue economy; the development of new materials including biodegradable plastic substitutes and urban, coastal and maritime spatial planning, among others.³⁵⁴

The report “Mission Starfish 2030: Restore our Ocean and Waters”,³⁵⁵ produced by the mission’s board, proposes concrete targets and timelines and sets out overall investment needs. The launch of the Horizon Europe missions in full implementation phase is expected in the 3rd and 4th quarters of 2021.



The new **LIFE** Programme will provide even more concrete opportunities in the areas of nature and biodiversity, circular economy and quality of life, climate action and, as a new branch of action, the clean energy transition.³⁵⁶ The European Commission has proposed an increase in the programme’s budget from €3.4 billion to €5.4 billion, and

it is expected that the proportion of the budget devoted to grants will increase from 81% to 85%.³⁵⁷ A new launch of the LIFE Call for proposals is expected for late spring 2021.



The **Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans)**³⁵⁸ was established in 2011 as an intergovernmental platform, open to all EU Member States and Associated Countries who invest in marine and maritime research. The platform provides resources to address ocean-

related international challenges, mainly through joint calls for transnational research and innovation projects (e.g. MarTERA Cofund on marine technologies, Blue Bioeconomy ERA-NET Cofund, etc.) JPI Oceans is to adopt a new Strategy Framework 2021-25 with three priority areas (Ocean Health, Ocean Productivity and Ocean Stewardship & Governance)



The **SwitchMed**³⁵⁹ initiative aimed to speed up the shift to sustainable consumption and production patterns in the Southern Mediterranean, notably through the promotion of circular economy approaches. The SwitchMed initiative is funded by the European Union and implemented by the United Nations

(UNIDO, UNEP and UNEP/MAP) and the Regional Activity Centre for Sustainable Consumption and Production (SCP/RAC), in close coordination with the Directorate-General for Neighbourhood and Enlargement (EU DG NEAR). To promote the development of the circular economy in the Mediterranean, SwitchMed offers direct support to the private sector (industry, start-ups and entrepreneurs), contributes to the creation of enabling policy frameworks and provides coordination, networking and communication services through a Networking Facility.

351 <https://www.consilium.europa.eu/en/press/press-releases/2020/12/04/informal-deal-on-european-maritime-and-fisheries-fund-for-the-period-2021-2027/>

352 https://ec.europa.eu/info/horizon-europe_en

353 https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_mission-oceans-citizens-summary_en.pdf

354 https://ec.europa.eu/info/horizon-europe/missions-horizon-europe/healthy-oceans-seas-coastal-and-inland-waters_en

355 <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/672ddc53-fc85-11ea-b44f-01aa75ed71a1>

356 <https://ec.europa.eu/easme/en/section/life/calls-proposals>

357 https://ec.europa.eu/easme/sites/easme-site/files/life_conference_report_v7.pdf

358 <https://www.jpi-oceans.eu/about>

359 <https://switchmed.eu/about-us/>



The Switchers Fund,³⁶⁰ developed by UNEP/ MAP and funded by SwitchMed among other institutions, is an impact fund for green start-ups covering the whole Mediterranean region. Their investment targets are mainly entrepreneurs who create value through eco-innovation by turning environmental challenges into business opportunities. It covers blue sectors such as sustainable tourism, energy, mobility and food production.



Importantly, the **UfM's smaller grants** have also been used in the past, for example to address employment opportunities in the region. Those have provided a valuable access to finance particularly for southern partners. An example is the UfM Grant Scheme for Employment Promotion – Regional response to the COVID-19 pandemic,³⁶¹ focused on improving work and living conditions in Mediterranean countries by supporting non-profit organisations, and other organisations who support entrepreneurs and micro, small and medium-sized enterprises (MSMs) at a regional level.

This call particularly targets MENA countries and regional actions, and supports projects aiming at improving economic resilience, promoting training, skills development and employability, entrepreneurial activity and capacity building.

Clearly, many other financing sources are also available at the sub-regional and country levels – including bilateral cooperation – for which a dedicated and further elaborated study would be needed to provide a good coverage. The Box below provides an overview of some of the main national public finance opportunities for the Mediterranean Blue Economy and climate change adaptation.

BOX 27 National public finance opportunities for climate adaptation and the Blue Economy in the Mediterranean

GERMANY

Through the Ministry for Economic Cooperation and Development (BMZ) and GIZ, Germany's national development agency, the German government leads international financing of climate change mitigation and biodiversity in developing, emerging and transition countries. Together with Morocco and the World Resources Institute launched the "NDC Partnership Instrument", which supports countries implement their Nationally Determined Contributions under the Paris Agreement. GIZ offers financial and technical cooperation in developing countries in areas such as sustainable fisheries and aquaculture, sustainable tourism, biodiversity and eco-system services.

France

The Agence Française de Développement (AFD) and its subsidiary entities PROPARCO (dedicated to the private sector) and the French Facility for Global Environment (FFEM) provide funding and support to over 4,000 projects across the world. In 2019, AFD Group committed nearly 2 billion euro to climate adaptation projects. In the Mediterranean, to mention a few key examples, the project "Depolluting the Mediterranean" aims to preserve the quality of water on Tunisia's Mediterranean coast, and the project "Fishing for Best Practice", based in Morocco, contributes to the development of the coastal and small-scale fishing sector.

Netherlands

The Dutch Fund for Climate and Development (DFCD), earmarked €160 million in the period 2019-2022 for climate adaptation and mitigation, of which at least 50% is earmarked for climate adaptation projects. DFCD is particularly relevant for Mediterranean businesses, and specially for OECD DAC Least Developed Countries (LDCs) in the region. Among its priority areas, the fund focuses investments in the four Rio Markers, including climate resilient water systems.

Luxembourg

The Blue Natural Capital Financing Facility (BNCFF) supported by the Government of the Grand Duchy of Luxembourg and managed by the International Union for Conservation of Nature (IUCN) supports blue natural capital projects with clear ecosystem service benefits, based on multiple income streams and appropriate risk-return profile.

³⁶⁰ <https://www.theswitchersfund.eu/en/>

³⁶¹ <https://ufmsecretariat.org/grant-scheme-2020/>

Impact financing: targeting sustainable infrastructures and SMEs

As part of the broader calls for sustainable and impactful investments, aimed to address climate change mitigation and adaptation challenges worldwide, a wide range of new impact funds are emerging.³⁶²

In this regard, a pivotal role is played by Multilateral Development Banks (MDBs) in financing blue economy initiatives in the Mediterranean, mainly through traditional streams of funding (such as grants and loans) but also via innovative financial instruments (blue bonds, equity, guarantees, etc.). This process is already having relevant consequences in reshaping the access to sustainable finance for businesses and SMEs in the Mediterranean.



The World Bank Group (WBG) has promoted **PROBLUE**,³⁶³ a new Multi-Donor Trust Fund, housed at the World Bank, that supports the development of integrated, sustainable and healthy marine and coastal resources.

PROBLUE's current commitments amount to over \$150 million, devoted to cross-sectorial initiatives in four thematic pillars: fisheries and aquaculture, marine pollution, oceanic sectors and seascape management. It has a global geographic coverage, although specifically in the Mediterranean Sea basin PROBLUE, it has supported the development of approaches for cleaner marine and coastal ecosystems in Maghreb countries, and the formulation of fishery performance indicators of Gaza fishery along the Mediterranean coast.³⁶⁴

In the EU front, the European Investment Bank (EIB) acts as the EU climate bank by investing in the sustainable blue economy and supporting initiatives aimed at reducing pollution and preserving this natural resource.³⁶⁵



The **European Investment Fund (EIF)** is the main EIB risk finance targeted at small and MSMEs across Europe. Three Mediterranean countries (Italy, France and Spain) rank as the main beneficiaries of EIF loans, mainly in the sectors of manufacturing, wholesale and retail trade and ICT. Micro enterprises constitute 92% of MSMEs supported.³⁶⁶

Recently, the EIF has piloted some regional partnerships with EU Member States – such as the 'Portugal Blue' Fund,³⁶⁷ a €50 million equity partnership targeting Portuguese companies in the blue economy ecosystem. Recently, the sub-national Climate Fund Initiative has been launched by the R20 Regions for Climate Action. The initiative has a dedicated Technical Assistance (TA) Facility attached to the main Blending Fund, in order to allow for support to valuable project idea in achieving a relevant maturity level and partnership capacity.

In December 2020, the European Bank for Reconstruction and Development (EBRD) became a signatory to the Sustainable Blue Economy Finance Principles and plans to expand the proportion of its sustainable lending to over 50% during the next five years.³⁶⁸

Similarly, the World Bank has issued in 2019 a 28.6 million euros 5-year Sustainable Development Bond, aimed to support the financing of development programs that are aligned with the Sustainable Development Goals (SDG).³⁶⁹



The **EU BlueInvest**, enabled by the European Maritime and Fisheries Fund, aims to boost innovation and investments in sustainable blue economy technologies. To do so, it supports readiness and access to finance for early-stage businesses, SMEs and scale-ups.³⁷⁰

Similarly, the European Union Initiative for Financial Inclusion (EUIFI),³⁷¹ created by the European Commission, aims to support MSMEs across the southern Mediterranean region of the Middle East and Northern Africa by improving their access to finance. The initiative is managed in partnership with EIB; EBRD; KfW; and the Agence française de développement (AFD). The EUIFI total budget amounts to €1.5 billion, structured in five regional facilities: microfinance, risk capital, advisory services, credit lines and guarantee funds.

³⁶² <https://www.sdfinance.undp.org/content/sdfinance/en/home/solutions/impact-investment.html>

³⁶³ <https://www.worldbank.org/en/programs/problue/overview>

³⁶⁴ <https://www.worldbank.org/en/programs/problue/our-work#6>

³⁶⁵ <https://www.eib.org/en/about/initiatives/preserving-our-oceans/index.htm>

³⁶⁶ <https://www.eif4smes.com/>

³⁶⁷ https://www.eif.org/what_we_do/resources/portugal-blue/index.htm

³⁶⁸ <https://www.ebrd.com/news/2020/ebd-signs-up-to-sustainable-blue-economy-finance-principles.html>

³⁶⁹ <https://www.worldbank.org/en/news/press-release/2019/11/21/world-bank-and-credit-suisse-partner-to-focus-attention-on-sustainable-use-of-oceans-and-coastal-areas-the-blue-economy>

³⁷⁰ <https://webgate.ec.europa.eu/maritimeforum/en/frontpage/1451>

³⁷¹ https://ec.europa.eu/neighbourhood-enlargement/neighbourhood/eu-initiative-financial-inclusion_en

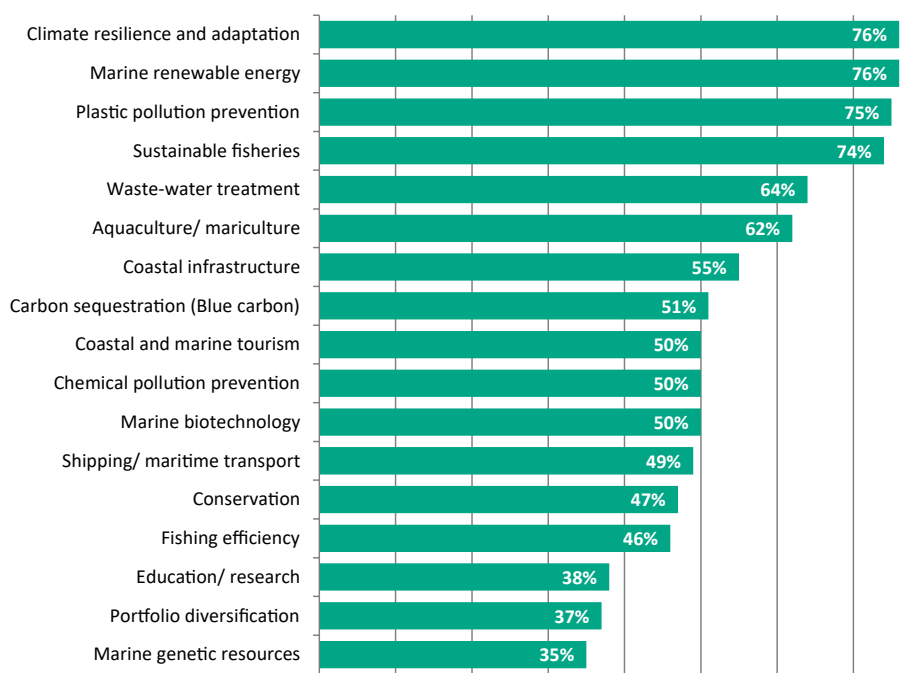
As for green funds, the Global Environment Facility (GEF)³⁷² provides developing countries and countries with economies in transition to meet the objectives of the international environmental conventions and agreements. In the Mediterranean area, the GEF offers co-financing possibilities for blue economy projects, such as the “Build back a blue and stronger Mediterranean” project,³⁷³ also focused in the area of MPAs.

Recently, the Sub-national Climate Fund Initiative³⁷⁴ has been launched by the R20 Regions for Climate Action.³⁷⁵ The initiative has a dedicated Technical Assistance (TA) Facility³⁷⁶ attached to the main Blending Fund,³⁷⁷ so as to allow for support to valuable project idea to get a relevant maturity level and partnership capacity.³⁷⁸

But a number of private sector initiatives are also emerging, targeting specifically enterprises – and SMEs – and aimed to support their sustainable business ideas (products or services) to reach a higher level of market readiness. For instance, the Katapult Ocean Accelerator³⁷⁹ investments targets blue economy start-ups at a global scale. So far, 32 enterprises in 17 countries have been supported, including Mediterranean start-ups such as ATLAN Space (Morocco) or Algaeing (Israel), who benefitted from early-stage impact investment and accelerator programmes.

All in all, private investors are more aware of (and keener on) sustainable ocean-related opportunities. As a recent study shows,³⁸⁰ this is especially true concerning climate change adaptation and mitigation, tackling marine plastic pollution and sustainable fisheries and aquaculture. However, to scale-up investors’ interest and awareness, the enabling conditions must be strengthened.

Figure 21 Investor opportunities in the sustainable Blue Economy
% of respondents. 218 respondents



Source: Responsible Investor, Credit Suisse, UNEPFI (2020) Ocean risk or opportunity? Is the sustainable Blue Economy investible?
<https://www.esg-data.com/blue-economy>

³⁷² <https://www.thegef.org/>

³⁷³ <https://www.thegef.org/project/build-back-blue-and-stronger-mediterranean>

³⁷⁴ <https://www.greenclimate.fund/project/fp152>

³⁷⁵ <https://regions20.org/sub-national-climate-fund-sncf-2/>

³⁷⁶ <https://www.climatefinancelab.org/project/sub-national-climate-finance-initiative/>

³⁷⁷ <https://www.climatefinancelab.org/project/sub-national-climate-finance-initiative/>

³⁷⁸ <https://regions20.org/approach-2/>

³⁷⁹ <https://katapultocean.com/>

³⁸⁰ <https://www.esg-data.com/blue-economy>

A close-up photograph showing several hands of different skin tones working together to assemble white puzzle pieces on a light-colored wooden table. One hand is in the process of placing a piece into the larger assembly. The background is softly blurred, focusing attention on the hands and the puzzle.

GOVERNANCE AND THE FUTURE OF SEA BASIN STRATEGIES

IN THE MEDITERRANEAN REGION

INTRODUCTION

The Mediterranean Sea is one of the most complex areas in the world. A bridge between three continents, this narrow area is surrounded by twenty-two countries with different levels of development, whose relationships have been shaped by several millennia of wars and alliances, conquests and retreats. This history results in a genuine mix of tensions and cooperation. The “Mare Nostrum” provides a strong common heritage for all surrounding countries and provides an opportunity to work together in the long term.

In response, Mediterranean countries have defined and endorsed at several frameworks addressing dedicated sectors or themes.

Notable examples include the environment (Barcelona Convention (UNEP/MAP)), fisheries (GFCM) as well as the Blue Economy (UfM). In addition, at subregional level, the Blue Economy has been a catalyst to develop dedicated cooperation taking the advantage of existing partnerships (eg. 5+5 or MAU).

All these frameworks have a common objective: the cooperation between actors for a sustainable blue economy in the Mediterranean region.

Further to all the work done and the progress achieved, the 2nd UfM Ministerial Conference on the Blue Economy has recalled the need to strengthen coordination and cooperation in the area of maritime affairs, in order to improve maritime governance and feasibility of maritime appropriate strategies, including at sub-regional level.



Source: UfM - 2nd Ministerial Conference on Sustainable Blue Economy (2 February 2021)

CROSS-CUTTING THEMES

OVERVIEW

At regional level



The Union for the Mediterranean (UfM) was set up with the mandate to “enhance multilateral relations, increase co-ownership of the process, set governance on the basis of equal footing and translate it into concrete projects, more visible to citizens” in the Mediterranean. It is based on the Paris Joint Declaration (2008). The UfM brings together

all countries of the European Union and 15 countries of the Southern and Eastern Mediterranean.

To enhance the political dimension, already two Blue Economy ministerial meeting have taken place, during which all UfM Parties have agreed on joint declarations to national and regional commitments for the sustainable development of the Blue Economy.

With the first ministerial declaration (17 November 2015),³⁸¹ the Ministers of the UfM countries decided to strengthen the potential of the blue economy in the Mediterranean region. On top of this, they agreed to improve maritime governance and achieving a conducive environment to promote jobs, innovation and knowledge-based business opportunities through the development of key maritime sectors.

As part of one of the deliverables of the UfM Ministerial Declaration of 17 November 2015 on Blue Economy, and in view of addressing maritime issues, a dedicated working group Blue Economy (BE WG) has been set to bring together the Mediterranean countries to exchange information, views and best practices, notably during the dedicated regional conference and to prepare the ministerial meetings.

The BE WG aims at creating/developing synergies among current initiatives as well as providing input to future actions and possible sea basin approaches/maritime strategies, without duplicating existing initiatives and bodies. In addition, the Ministerial Declaration stressed the importance of establishing appropriate networking mechanisms for blue economy stakeholders around the Mediterranean. To respond to the need to support the engagement of the stakeholders, the UfM Secretariat has established the Mediterranean Blue Economy Stakeholder Platform (MedBESP).

As a regional networking platform for sharing knowledge and supporting the development of the blue economy, MedBESP³⁸² is the largest “one-stop-shop” for general, technical and sectoral information related to marine and maritime affairs in the Mediterranean. It aims at improving maritime governance in the Mediterranean by promoting a more strategic, integrated and coordinated approach to policies; enabling cooperation and synergies across sectors and borders as well as improving dissemination of knowledge, networking and capacity building.

As part of the process leading to the 2nd UfM Ministerial on Sustainable Blue Economy, the UfM Co-Presidency and Secretariat launched an online Stakeholders Consultation in March 2020 to promote the exchange of knowledge and participation within the blue economy community.

The consultation was structured around priority themes identified with the UfM Member States, which ranged from maritime governance, sustainable food, tourism, maritime transport and ports management to adaptation to climate change, marine energy, blue skills development and employment, safety and surveillance. Around 100 entities – including research centres and universities, public administrations, private sector, international organisations and non-governmental organisations – submitted over 350 substantial feedbacks.

³⁸¹ https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

³⁸² <https://medblueeconomyplatform.org>

On the 2nd February 2021, six years after the first UfM Ministerial Declaration, Ministers renewed their political commitment towards a more ambitious declaration on Sustainable Blue Economy,³⁸³ firmly committing to cooperate closely and address joint challenges in key blue economy sectors.

They acknowledged the work carried out under existing co-operation and coordination frameworks. They called for further strengthening of synergies of projects and activities between the Union for the Mediterranean Secretariat, the European Commission, the International Maritime Organization, the UNEP/MAP, and other agreed relevant regional executive organisations. They also emphasised the need to strengthen coordination and cooperation in the area of maritime affairs.

This was in order to improve maritime governance as well as for exploring the added value and feasibility of maritime appropriate strategies, including at sub-regional level such as the European Union Strategy for the Adriatic and Ionian Region (EUSAIR) or the WestMED initiative. Ministers agreed to promote transformative policies and tools, such as maritime clusters or maritime spatial planning, and support the transition to carbon neutral and circular blue economy.

New joint activities and projects will be set up on a wide range of issues, including blue skills, marine litter, marine renewable energies and nature-based tourism, among others.

The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention), Mediterranean Action Plan (MAP) is a regional governance framework on environmental issues. The overall objective of the Barcelona Convention is to protect the Mediterranean Sea ecosystems and promote the sustainable development agenda of the region. This institutional cooperation framework implements a regional approach to address common challenges of environmental degradation as well as protect marine and coastal ecosystems.

The Barcelona Convention gathers the 21 Mediterranean countries and the European Union (as Contracting Parties of the Barcelona Convention). A Memorandum of Understanding between the Union for the Mediterranean (UfM) Secretariat and the United Nations Environment Programme/Mediterranean Action Plan (UNEP/MAP) was agreed in 2013. The 2nd UfM Ministerial Declaration on Sustainable Blue Economy reconfirms the commitment to achieve the existing long-term objectives for sustainable management of the sea and for a cleaner Mediterranean by the year 2020.

The General Fisheries Commission in the Mediterranean (GFCM) promotes the development, conservation, rational management and best utilisation of living marine resources, as well as the sustainable development of aquaculture in the Mediterranean, Black Sea and connecting waters. It consists of 23 Member countries along with the European Union. Membership is open to both Mediterranean coastal states and regional economic organisations as well as to United Nations member states, whose vessels engage in fishing in Mediterranean waters.

In the 2021 UfM BE Declaration, Ministers recalled the important role played by GFCM as the key pillar for regional cooperation on fisheries. Such importance was not only to define and endorse management recommendations with the view to sustainably manage key stocks in the region, but also to develop sustainable aquaculture.

383 <https://ufmsecretariat.org/wp-content/uploads/2021/02/Declaration-UfM-Blue-Economy-EN-1.pdf>

At subregional level



At subregional level, additional organisations were also set.

The 5+5 Dialogue is an intergovernmental cooperation initiative between Malta, Italy, France, Spain, Portugal, Mauritania, Morocco, Algeria, Tunisia, and Libya. Launched in 1990, 5+5 is steered through Ministerial Conferences of ministers of Foreign Affairs.

On June 23 of 2019 in Marseilles, the Ministers of Foreign Affairs of the 5+5 Dialogue States (France, Portugal, Spain, Italy, Malta, Mauritania, Morocco, Algeria, Tunisia, Libya) signed the "Commitments for a new ambition in the Mediterranean" in order to implement the projects the civil society suggested and provide a collective response to the common challenges in the Mediterranean with the "Summit of the Two Shores, Mediterranean Forum".³⁸⁴



The Maghreb Arab Union (MAU) is a cooperation initiative based on Marrakech Treaty (1989) between Mauritania, Morocco, Algeria, Tunisia and Libya (Southern members of 5+5). MAU aims to support "common policy in all the domains" in order to allow social and economic development through common projects and integrated or sectoral programmes. In economic matters, the common policy aims to ensure the industrial, agricultural, commercial and social development of the Member States.

In association with these regional, subregional, multilateral organisations, strategies and political initiatives were defined to deal with maritime affairs.

The Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025³⁸⁵ provides an integrative policy framework for all stakeholders, including MAP partners, to translate the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) at the regional, sub-regional, national and local levels in the Mediterranean region.



MSSD is under revision to define MED 2050. MED 2050 is an ambitious foresight exercise designed as an original science-policy interface, aiming at mobilising decision makers and stakeholders from the North and South of the Mediterranean, going beyond geographical and institutional borders. Its goal is to 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.³⁸⁶ For MED2050, a network has been built to be open, broad and to welcome interested stakeholders from the 3 shores of the Mediterranean.



Under the Barcelona Convention, various protocols have been adopted to help with the protection of the Mediterranean Sea and its coastal regions. Among them, the integrated coastal zones management (ICZM) protocol (adopted in 2010) is a first step for the blue economy

development. Although Maritime Spatial Planning (MSP) is not expressly mentioned in the Protocol on ICZM in the Mediterranean, spatial planning of the coastal zone is considered an essential instrument of the implementation of the same Protocol. One of the main objectives of ICZM is to "facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development" (art. 5).

To support the sustainability of the blue economy at their 18th Ordinary Meeting, the Contracting Parties to the Barcelona Convention committed to the implementation of the ecosystem approach (EcAp) to the management of human activities in the Mediterranean, with the ultimate objective to achieve a Good Environmental Status (GES) of the Mediterranean Sea. The implementation of the EU Marine Strategy framework Directive (MSFD, 2008) and EU Maritime Spatial Planning (MSPD, 2014) by the EU Member States in the region presents crucial opportunities and needs for the application of the ICZM/MSP and EcAp throughout the Mediterranean region with the common ultimate aim to achieve GES of the Mediterranean Sea.

The first BE UfM Ministerial Declaration promotes "the application of cross-cutting policy tools, such as maritime spatial planning and integrated coastal zone management, taking into account land-sea interactions through an ecosystem-based approach and the importance to accelerate efforts in taking necessary measures to develop a coherent and well-managed network of marine protected areas to meet the objectives of the Mediterranean Action Plan". In the second BE UfM Ministerial, the importance of these tools was recalled as enablers for "the development of sustainable blue economy sectors and activities, attract investment, and reduce impacts on the environment".

³⁸⁴ https://www.diplomatie.gouv.fr/IMG/pdf/engagements_de_marseille_eng_cle8d249d.pdf

³⁸⁵ https://wedocs.unep.org/bitstream/handle/20.500.11822/7097/mssd_2016_2025_eng.pdf?sequence=1&isAllowed=y

³⁸⁶ <https://planbleu.org/en/projet/med-2050-towards-a-shared-vision-on-a-sustainable-mediterranean-in-2050-and-transition-issues/>



The EU Strategy for the Adriatic and Ionian Region (EUSAIR)³⁸⁷ is a macro-regional strategy adopted by the European Commission and endorsed by the European Council in 2014. The EUSAIR covers nine countries: four EU Member States (Croatia, Greece, Italy, and Slovenia) and five non-EU

countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia).

The EUSAIR promotes economic growth and prosperity in the region by improving its attractiveness, competitiveness and connectivity. It also aims at protecting the sea, coastal and inland environment and ecosystems.

Its Pillar I is dedicated to Blue Growth with three specific objectives (i) to promote research, innovation and business opportunities in blue economy sectors, by facilitating the brain circulation between research and business communities and increasing their networking and clustering capacity, (ii) to adapt to sustainable seafood production and consumption, by developing common standards and approaches for strengthening these two sectors and providing a level playing field in the macro-region; and (iii) to improve sea basin governance, by enhancing administrative and institutional capacities in the area of maritime governance and services.

In 2015 the Union for the Mediterranean Ministerial Declaration on the Blue Economy³⁸⁸ invited the participating countries to explore the added value and feasibility of appropriate maritime strategies at sub-regional level. The initiative for the sustainable development of the blue economy in the western Mediterranean region³⁸⁹ was adopted by the European Commission on 19 April 2017 and endorsed by the Council on 26 June 2017.

In its Conclusions on Blue Growth,³⁹⁰ the Council has also invited the participating countries, the European Commission and the Union for the Mediterranean (UfM) Secretariat to take forward their implementation in coherence with all the other initiatives which are taking place in the region.



The WestMED initiative is the result of years of dialogue between ten countries of the western Mediterranean region involved in the 5+5 Dialogue, who work together on their shared interests for the region.

On December the 4th 2018, in Algiers, the 10 Ministers of the Western Mediterranean countries, together with the European Commission and the Union for the Mediterranean, adopted a declaration to strengthen regional cooperation on the WestMED initiative.

The signatories agreed on a common roadmap for the development of a sustainable blue economy in the sub-basin to generate growth, create jobs and provide a better living environment for Mediterranean populations, while preserving the services performed by the Mediterranean ecosystem.

In this roadmap, 6 priorities were agreed upon:

1. Maritime safety and the fight against marine pollution
2. Maritime cluster development
3. Skills development and circulation
4. Sustainable consumption and production
5. Biodiversity and marine habitat conservation and restoration
6. Development of coastal communities and sustainable fisheries and aquaculture

³⁸⁷ <https://www.adriatic-ionian.eu/wp-content/uploads/2018/04/For-a-prosperous-and-integrated-Adriatic-and-Ionian-region.pdf>

³⁸⁸ https://ufmsecretariat.org/wp-content/uploads/2015/11/2015-11-17-declaration-on-blue-economy_en.pdf

³⁸⁹ https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/com-2017-183_en.pdf

³⁹⁰ <http://data.consilium.europa.eu/doc/document/ST-10662-2017-INIT/en/pdf>

With the 2021 UfM Declaration, WestMED initiative and the EUSAIR were recognised by the ministers as successful examples of cooperation, focused on clear goals, priorities and measurable targets and as a catalyst for the development of sustainable blue economy projects in the region.

BOX 28 The 10 priorities of the 2nd UfM Ministerial Declaration on the Blue Economy

1. Governance and the future of sea basin
2. Marine research and innovation, skills, careers and employment
3. Sustainable food from the sea: fisheries and aquaculture
4. Sustainable, climate-neutral and zero-pollution maritime transport and ports
5. Interactions between marine litter and the blue economy
6. Coastal and maritime tourism
7. Maritime Spatial Planning and Integrated Coastal Zone Management
8. Marine renewable energies
9. Maritime safety and security of blue economy activities
10. Sustainable investment in the blue economy



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