Union for the Mediterranean
Union pour la Méditerranée
الاتحاد من أجل المتوسط

Towards a Sustainable Blue Economy in the Mediterranean region

2024 Edition

The UfM Secretariat is co-funded by the EUROPEAN UNION

Union for the Mediterranean
Union pour la Méditerranée
الاتحاد من أجل المتوسط

Follow The UfM on:

ufmsecretariat

@UfMSecretariat

union-for-the-mediterranean

@ufmsecretariat

Publication coordinator and supervisor	Alessandra Sensi, Head of sector, Environment and Blue Economy, UfM Adriana Salazar, Sustainable Blue Economy Expert, UfM
Study Team (Ecorys)	Javier Fernández Irene Alonso Matteo Bocci Celia Murcia Thanos Smanis Jan Wynarski
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.
Date of publication	31 October 2024

TABLE OF CONTENTS

Blue Economy Sectors

Cross-Cutting Themes

INTRODUCTION AND CONTEXT

This is the 3rd edition of the UfM periodic publication on the status of the sustainable blue economy in the Mediterranean, following the ~~2021~~ and 2017 versions.

The aim of this publication remains to provide an accurate depiction of the status of Blue Economy sectors in the Mediterranean region, focusing on key emerging trends and drivers for the sustainable development of BE sectors based on the most up-to-date quantitative and qualitative data available.

For each of the sectors addressed, an overview of the main economic indicators is provided, paired with key environmental, technological and social considerations.

The main regional cooperation platforms, initiatives, and projects are highlighted. Recent developments in terms of policy frameworks and technical cooperation -and particularly the role of the Union for the Mediterranean- are also outlined.

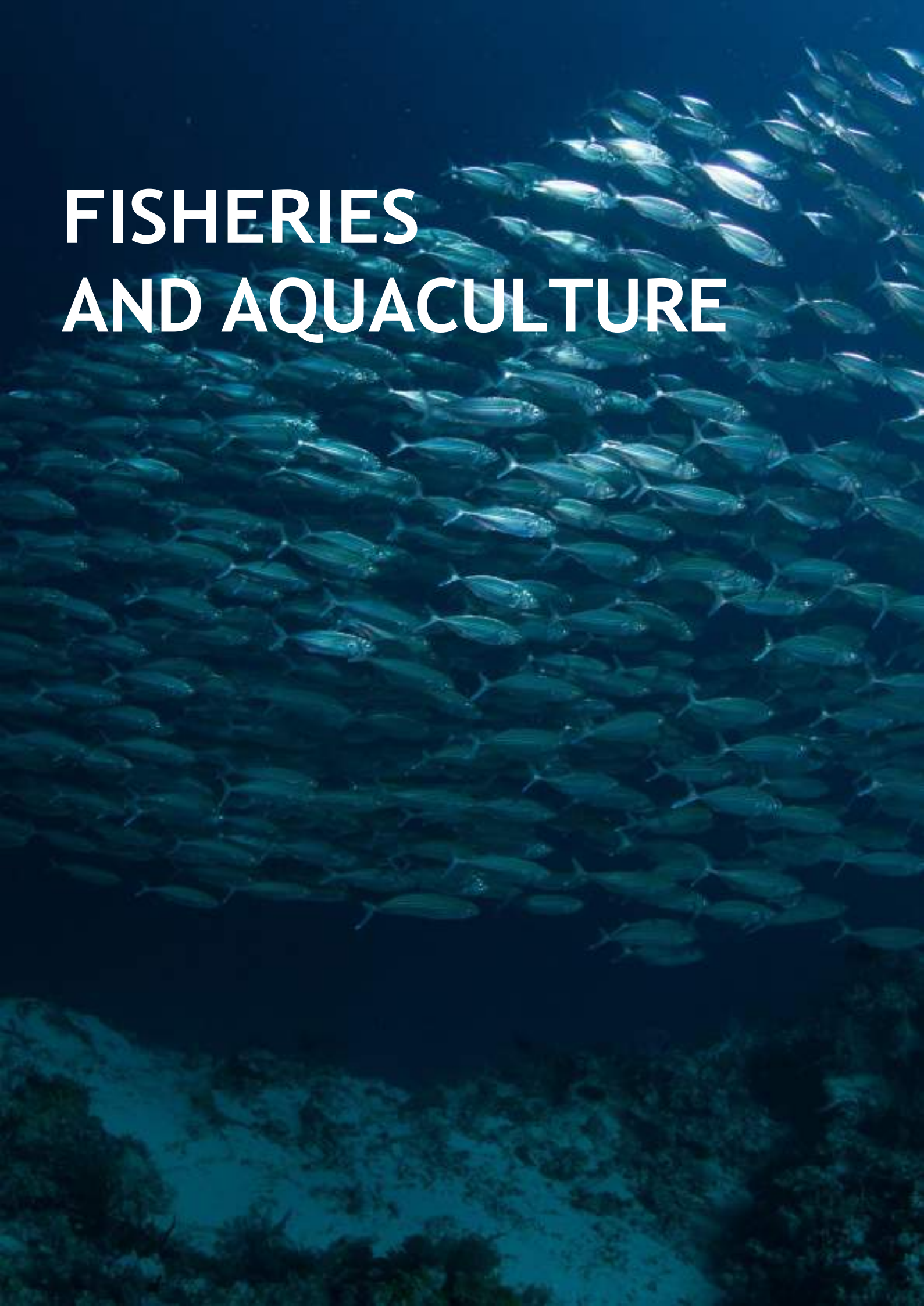
In addition, the report provides an assessment of the future outlook (2025-2030), based on observed trends, drivers and challenges.

Lastly, the present edition of the report places a specific focus on employment opportunities: an overview of expected career pathways and skills needs is provided for each sector.

Following the priorities of the 2nd UfM Ministerial Declaration on Sustainable Blue Economy, the publication covers the following sectors: *Maritime Transport & Ports, Marine renewable energies, Coastal and Maritime Tourism; Fisheries and Aquaculture; Interactions between marine litter and the blue economy; and Maritime safety and security*.

To complement the analysis, opportunities offered by key BE enablers and tools are also assessed: *Sustainable Blue Economy Financing Sustainable Results; Maritime skills, careers and employment; Marine Research and Innovation; Governance of the sustainable blue economy; and Maritime Spatial Planning and Integrated Coastal Zone Management.*

Blue Economy Sectors in the Mediterranean Sea



FISHERIES AND AQUACULTURE

INTRODUCTION

The 2021 UfM Ministerial Declaration on SBE[1] stresses the vital importance of Mediterranean fisheries for food security in the region and as a source of essential socio-economic value for coastal communities across the basin, particularly through small-scale fisheries, which make an important contribution to nutrition, food security, sustainable livelihoods, and poverty alleviation of coastal areas, particularly in the South/East of the basin.

The 2021 Ministerial also takes in to account the growing potential of sustainable aquaculture to sustainably manage key stocks in the region and diversify the sector towards innovative products and value-chains.

To ensure the environmental, social, and economic sustainability of Mediterranean fishery and aquaculture resources, both for present and future generations, UfM member countries are called to apply an ecosystem-based approach to fisheries management, provide adequate protection of marine environments and fight illegal and unreported fishing across the Mediterranean region.

The Declaration notably acknowledges the important role played by the General Fisheries Commission for the Mediterranean (GFCM) as the key pillar for regional cooperation and urges UfM member countries to comply with GFCM management recommendations, while welcoming the adoption of the MedFish4Ever Ministerial Declaration[2] as a strong political commitment to ensure the environmental, social and economic sustainability of Mediterranean Sea fishery resources for present and future generations.

More recently, in Athens[3] , Mediterranean stakeholders called for a level playing field to achieve growth of fisheries and aquaculture that is socially, economically, and environmentally sustainable.

Not all Mediterranean countries, in fact, have the same status or are facing the same challenges for the sector, and advancing towards the harmonization of the Mediterranean's approach to the sectors requires strong political will – notably, to drive collaborative and cooperative approaches, find cross-sectoral complementarities and strengthen a common regulation across the region.

Addressing the persisting overexploitation of fisheries, while equipping local operators to fully respond and adapt to the challenges posed by climate change are essential challenges for the sectors.

Leveraging the digital transition and smart data-driven governance is critical for the sector progress, and so is to offer valuable training and sharing of practices to support sectoral needed skills and competences through capacity building.

There is equally a need for greater gender parity, with more female representation at senior positions, whilst harnessing the enthusiasm and passion offered by young professionals for an innovative and sustainable sector. Small-scale fisheries are also a vital element of the sector for the whole region including for northern African countries, as a main source of nutrition, food security, sustainable livelihoods and poverty alleviation for some local communities in coastal areas.

1 Union for the Mediterranean (2021) Ministerial Declaration on Sustainable Blue Economy
2 GFCM (2023) GFCM high-level conference on MedFish4Ever initiatives https://oceans-and-fisheries.ec.europa.eu/news/mediterranean-fisheries-and-aquaculture-outcomes-gfcm-high-level-conference-medfish4ever-initiatives-2023-10-04_en
3 Union for the Mediterranean (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy: Outcomes and Main Messages

OVERVIEW

The fisheries and aquaculture sector in the Mediterranean[4] has reached a total production of over 1,5 million tonnes (about 55% from fisheries and 45% from aquaculture), generating revenues of around EUR 18 billion (approximately 40% from fisheries and 60% from aquaculture) and supporting over 700 thousand jobs (over 60% in fisheries and les then 40% in aquaculture) along the full value chain.[5]

Over time, aquaculture has become a much more efficient and economically relevant sector and steadily increased since 2011 as a relevant source of production for the region, even in the context of an overall decrease in the period 2019/2021 mainly due to the effect of the COVID-19 pandemic on fleets, demand, and trade.

As a result, aquaculture is increasingly making a valuable contribution to food security -in some Mediterranean countries such as Egypt, aquaculture provides 20% contribution of aquatic animal foods to animal protein supply,[6] employment, and economic development in the region. When it comes to social impacts, nevertheless, the relevance of fisheries as a larger employer segment for the sector in the region makes this activity extremely valuable and critical mostly for the local labour market. Therefore, due to different levels of labour intensity and specialisation, in fact, the transition from fisheries to aquaculture does not allow a direct substitution of one sector with another as a main source of employment for affected workers.

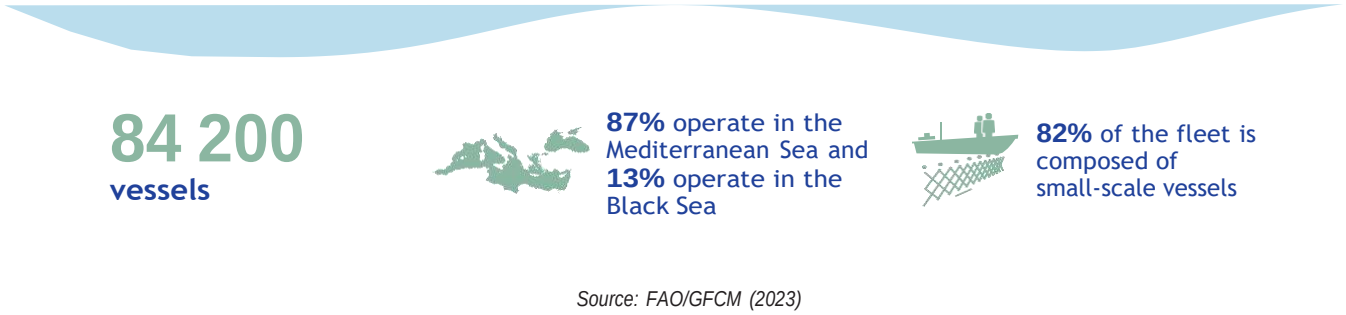
The sector is also facing a number of persisting challenges to be addressed towards 2030, including supporting sustainable fisheries and aquaculture practices, including through the energy transition[7] of the sector, eradication of illegal, unreported, and unregulated fishing, promotion of just and inclusive employment, greater technical cooperation and knowledge sharing as well as efficient regional and subregional partnerships.[8]
Before addressing these aspects in a later chapter, further details on each of the two thematic segments specifically are provided.

Fisheries

Landings in the Mediterranean remain largely dominated by small pelagic fish, mainly European anchovy (Engraulis encrasicolus) and sardine (Sardina pilchardus). It must be noted, nevertheless, that the overall composition of landings has shifted over time, with dramatic changes in the early '00s (following previous changes in the '90s).[9]

For example, all the main pelagic species has shown wide fluctuations through time[10] , while a number of demersal species followed an overall increasing trend[11] while several other species have decreased.[12]

Figure 1 A snapshot of fisheries across the Mediterranean (and the Black Sea)



Source: FAO/GFCM (2023)

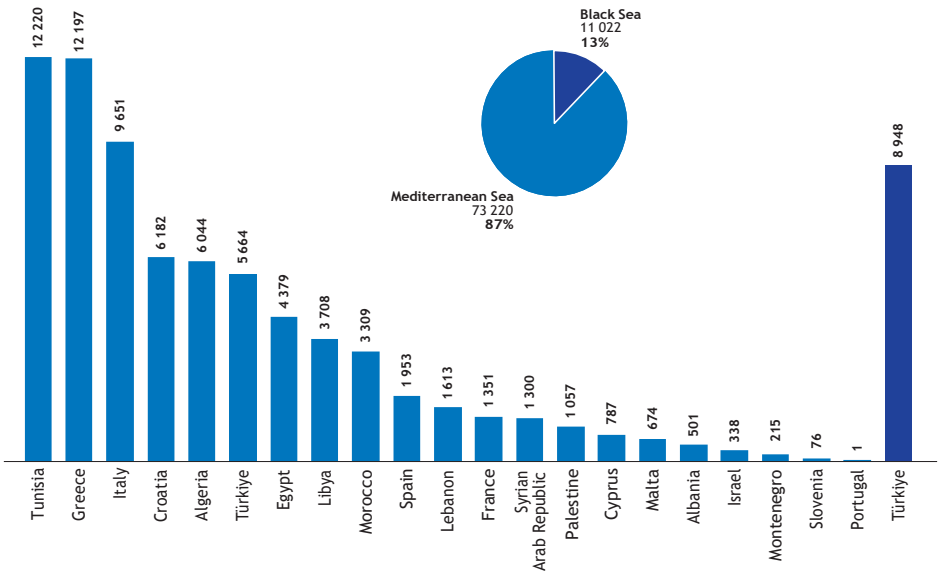
4 Given that FAO/GFCM data are aggregating both Mediterranean and Black Sea data and, to extract the Mediterranean specific data, we used the Mediterranean vessel shared as a proxy (87%). Black Sea practiced are anyhow residual if compared to the while Mediterranean
5 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
6 FAO (2024) The State of World Fisheries and Aquaculture 2024 - Blue Transformation in action
7 European Commission (2023) Energy transition of the EU fisheries and aquaculture. More information available at: https://etransition-fish-aquaculture.eu
8 FAO/GFCM (2021) 2030 Strategy for Sustainable Fisheries and Aquaculture
9 Ibid
10 European anchovy, European sprat and round sardinella (Sardinella aurita)
11 Deep-water rose shrimp (Parapenaeus longirostris), common cuttlefish (Sepia officinalis), rapa whelk (Rapana venosa), red mullet (Mullus barbatus) and surmullet (Mullus surmuletus)
12 Including European hake (Merluccius merluccius) and whiting (Merlangius merlangus)

The operating fishing fleet in the Mediterranean[13] is composed of around 75,000 fishing vessels, with a total capacity of over 750,000 gross tonnages (GT).[14] The trend, in this respect, signals a limited decrease in terms of numbers of vessels (-1.2%) and a small increase in capacity (+3%) from previous reporting years.[15]

In terms of individual country performance, Tunisia, Greece, Italy and Türkiye together account for the majority of the fishing fleet in the Mediterranean, while two-thirds of the total fishing capacity is represented by five countries - Italy, Türkiye, Tunisia, Egypt, and Algeria.[16]

"Small-scale vessels" remain the most prominent type, covering over 80% of the regional fleet, and particularly in the central and eastern subregions where it represents 85% of the operating fleet. The remaining 18% of the fleet ranges amongst "Trawlers and beam trawlers" (from 5% in central Mediterranean to 13% in the Adriatic), "Purse seiners and pelagic trawlers" -with its relative peak in the western Mediterranean (12%) and its lowest in the central Mediterranean and Adriatic Sea (3% each) – and a miscellaneous 'others' (5,1%).[17]

Figure 2 Number of fishing vessels operating across Mediterranean countries



Source: FAO/GFCM (2023)

Figure 3 Distribution of fisheries types across the fleets of different areas in the Mediterranean)

Source: FAO/GFCM (2023)

13 Mediterranean values obtained by using the Med vessels share (87%) as a proxy
14 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
15 Ibid
16 Ibid
17 Ibid

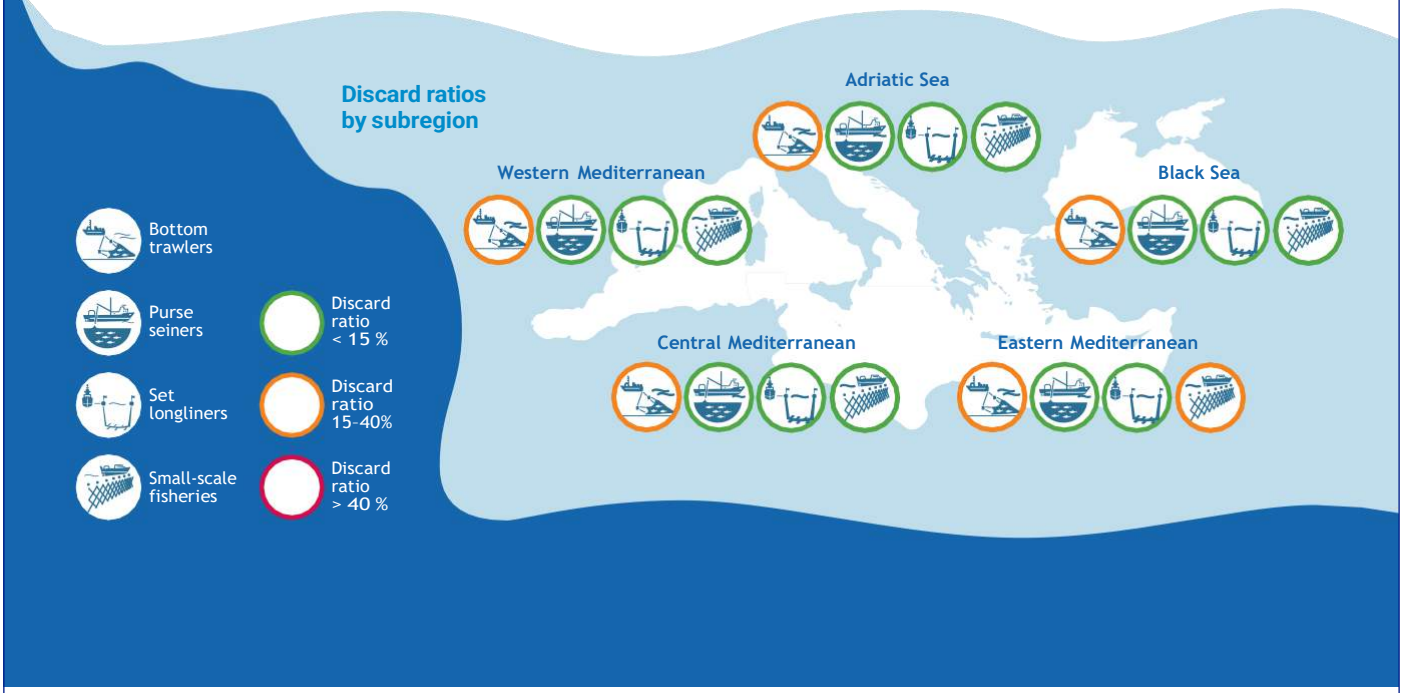
In terms of productivity and environmental damage, persisting high levels of fishing discards reduce the overall harvesting opportunities across the region, while negatively impacting the quality of marine ecosystems.[18]

In this respect, bottom trawlers remain the main responsible for high discards, despite some improvements since previous reporting years.[19]

Although small-scale fisheries seem to produce relatively low discard ratios, with estimates around 10 percent of the total catch in almost all subregions, the high ratio of such fisheries in the region makes it difficult to have a rigorous analysis of discards, resulting in scarce and limited information in some areas.[20]

A growing number of management plans and restricted areas across the Mediterranean offers a valuable regional framework to reduce unsustainable fishing pressure on key species. In this respect, 8% of the total fishing fleet operates within the context of fishery management plans (10 established) and management measures (8 established), with 154 vessels authorised to operate across fisheries restricted areas (3 established). Greater efforts are nevertheless needed, in terms of both extension and enhancement, to achieve greater sustainability across the region.

Figure 4 Relevance and type of discards across the different areas in the Mediterranean



Source: FAO/GFCM (2023)

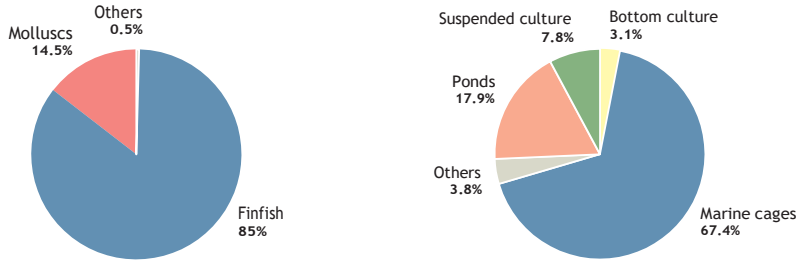
18 Ibid
19 Ibid
20 Ibid

Aquaculture

Although freshwater aquaculture remains the main source of farming in the region (about 70% of total volumes), marine (and brackish water) aquaculture showed a positive trend across the Mediterranean[21] over the past 10 reporting years (from 2011 to 2021): about 90% growth in production value (currently about EUR 5 billion) and 75% growth in value (currently about EUR 5 billion).[22] The majority of production (85%) refers to finfish[23] , with constant growth over the past 10 years, and with a stable minority (about 15%) of molluscs and other residual sources (including fish, crustaceans, molluscs, algae and other aquatic plants). The major production method used is marine cages (about 68%), followed by ponds farming (about 18%) and other cultures including suspended (about 8%) and bottom (over 3%).

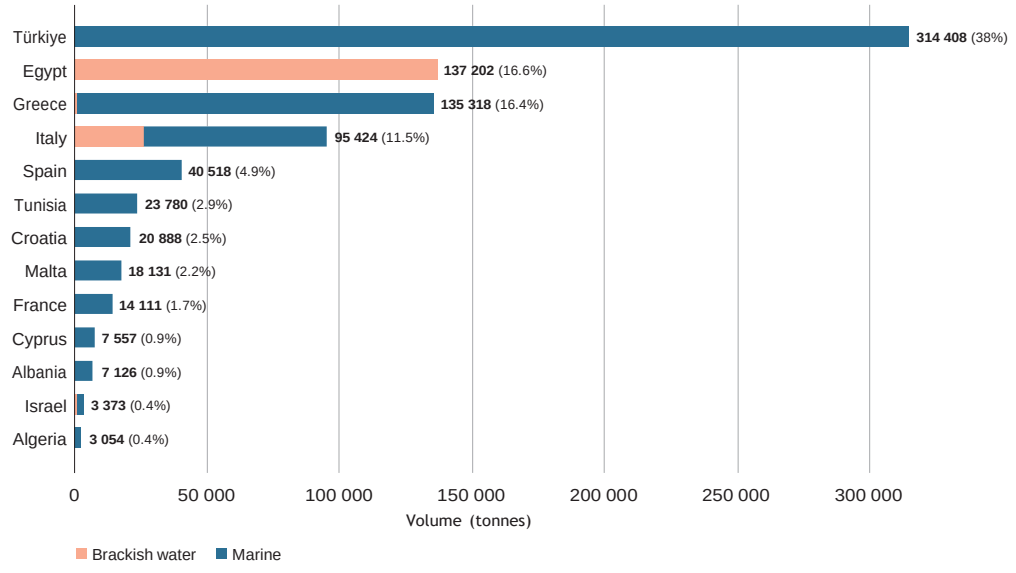
The average annual aquaculture production also varies across Mediterranean countries and is clearly led by Türkiye (38% of volume), followed by Egypt and Greece (each over 16%) and Italy (about 12%). Other Mediterranean countries follow with a much lower percentage if compared to those leading four (from about 5% of Spain towards less than 3% each for Tunisia, Croatia, Malta, France, etc.).[24] In terms of growth in volume, throughout the past decade, the best performances have been those of Albania (about 60% increase), Algeria (over 40% increase), Egypt and Türkiye (both about 35% increase). The largest decreases occurred in Slovenia (about 40% decrease), Bosnia and Herzegovina (over 25% decrease) and Montenegro (over 13% decrease).[25]

Figure 5 Relevance and type of production (left) and method (right) across the Mediterranean



Source: FAO/GFCM (2023)

Figure 6 Relevance and type of production (left) and method (right) across the Mediterranean



Source: FAO/GFCM (2023)

21 Ibid
22 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
23 A term used to separate true fish from shellfish, crayfish, jellyfish
24 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
25 Ibid

Table 1 Initiatives related to Mediterranean Fisheries and Aquaculture

AquaWest Technical Group	The AquaWest Technical Group is promoted under the WestMED Strategic Initiative[26] and consists of a number of high-level policymakers, researchers and other stakeholders active in the Aquaculture sector across western Mediterranean countries (northern and southern shores). It aims to promote cooperation and collaboration across the Mediterranean to generate innovative solutions for the development of economically and socially sustainable aquaculture.
GFCM 2030 Strategy	Aims towards a common vision and guiding principles to achieve sustainable fisheries and aquaculture in the region as pillars for the livelihoods of Mediterranean and Black Sea coastal communities, ensuring their transformation into a productive and sustainable food system that contributes to thriving economies and healthy ecosystems. GFCM builds upon FAO Guidelines for Sustainable aquaculture that were adopted by FAO this last July and they are worldwide and works on that principles specifically on the Mediterranean region.
Energy Transition Partnership	Aims to set up an open, transparent, and inclusive framework to enhance collaboration, align intents with other partners, mobilise resources and develop activities and solutions to deliver on the energy transition in the sector. It is a platform for stakeholder dialogue, collaboration and knowledge sharing wherein stakeholders can participate in dialogues and workshops on relevant themes such as innovation, addressing knowledge gaps, technology, skills, and finance.
UNEP-MAP Regional Plan for Aquaculture	Aims to reduce and prevent pollution in the Mediterranean from the unsustainable management of aquaculture. In line with UN Sustainable Development Goal 14, requires the establishment of a regulatory framework (by 2027) that sets the operational conditions for aquaculture facilities, and provides for the implementation of measures to minimise pollution from aquaculture activities (by 2028/2030), to promote environmentally sustainable aquaculture (by 2027) and to regulate the generation of plastic waste from aquaculture (by 2028).

26 More information at: https://westmed-initiative.ec.europa.eu/aquawest/

Table 2 Projects related to Mediterranean Fisheries and Aquaculture

Project	Description	Funding Source	Period
BlueAquaEDU	Aims at exploring gamification as a pedagogic approach to engage and motivate young persons in aquaculture, post-harvesting value chain and valorisation of the processing by-products sectors education. It aims to enhance digital, green, soft, transversal, inter/multi-disciplinary, managerial, entrepreneurial and project management skills of the next generation of Aquaculture graduates and will fill gaps of lack of structured, continued collaboration between industry and educational institutions and the lack of skills ecosystems at sea basin level by bringing together education, industry, and public authorities.	EMFAF	2023-2026
BOUTCAR	Aims to create an educational program to allow young people and adults to improve their knowledge and skills to create sustainable jobs in the Blue Economy.	EMFAF	2023-2026
ULTFARMS	Aims to increase the low-tropic aquaculture capacity in Europe through innovative processes which optimise production in challenging offshore conditions. The main results of this project include services offered to aquaculture producers for monitoring and minimising diseases and alien species, managing inputs, optimising sustainable production and demand management including risk analysis. It presents an advancement in sustainable offshore aquaculture which benefits the environment and the economy.	Horizon Europe	2023-2026
MULTI-STR3AM	Aims to provide valuable microalgal products for large end-users in the food, feed, and fragrance sectors by reducing costs, increasing scale, and boosting sustainability. The main results are expected to be producing components for these various materials and will pave the way for sustainable industrial-scale microalgae cultivation towards a sustainable future for European bio-based industries.	Horizon 2020	2023-2025
WINBLUE	Aims to address the overlooked and undervalued contribution of women in the blue economy and seeks to accelerate the empowerment of women in this field. It addresses gender disparities in the aquaculture industry by promoting women´s participation in technical-scientific roles, implementing gender equality plans and facilitating upskilling programmes, thus contributing to a more inclusive and diverse aquaculture workforce in Europe.	EMFF	2023-2025
SeaChem	Aims to provide high-level training in offshore cultivation and valorisation of seaweed to a new generation of 10 high achieving doctoral candidates and to equip them with the transferable and scientific skills necessary for thriving careers in the burgeoning area of non-land-based biomass cultivation and use. It opens innovative opportunities in offshore seaweed production for the growing need for a cost-effective, renewable, and sustainable production of high-end, high-value chemicals for the food, health, personal care, and chemical industry.	Horizon Europe	2022-2026
REALM	Aims to look for solutions to increase the sustainability and reduce the costs of soilless farming and microalgae production. It will increase the circularity and profitability of microalgal production and soilless farming.	Horizon Europe	2020-2025

Project	Description	Funding Source	Period
AQUAEXCEL 3.0	Aims to further ensure aquaculture research is aligned with industry needs to boost the sector by expanding the Transnational Access program, developing new tools to attain pace with rapid scientific development and add value to existing tools and resources. The project is developing free online training courses which are multi-partner based and demand-driven focused on the spread of good practices and the transfer of knowledge based on project results and laboratory experiment results. The main focuses are on shellfish and microalgae research as well as transnational access and networking activities	Horizon 2020	2020-2025
E-FishMed	Mediterranean virtual regional training academy on fisheries control and inspection. promotes cooperation in the fight against IUU fishing, the implementation of General Fisheries Commission for the Mediterranean (GCFM) and International Commission for the Conservation of Atlantic Tunas (ICCAT) conservation and management measures.	EMFAF	2022-2025
MedAID	Aimed at increasing the overall competitiveness and sustainability of the Mediterranean marine fish-farming sector, throughout the whole value chain.	Horizon 2020	2017-2021
Aqua-LIT	Preventive Measures for Averting the Discarding of Litter in the Marine Environment from the Aquaculture Industry.	EMFF	2019-2020
BlueFasma	Empowering innovation capacity of SMEs, maritime clusters and networks in MED islands and coastal areas to support blue circular economy growth in fishing/aquaculture.	Interreg MED	2019-2022
PerformFISH	Consumer driven Production: Integrating Innovative Approaches for Competitive and Sustainable Performance across the Mediterranean Aquaculture Value Chain.	Horizon 2020	2017-2022
NewTechAqua	Aimed at expanding and diversifying European aquaculture production of finfish, molluscs, and microalgae by developing and validating technologically-advances, resilient and sustainable applications.	Horizon 2020	2020-2023
Smart-Hatchery	Aimed at increasing the profitability of fish farmers by reducing the costs of feeding processes in weaning stages, while improving the quality of the feed and rearing water and offering a high-quality and safe seafood with the best organoleptic and nutritional values	EMFF	2019-2021
EUFish Sustainable Growth	Aimed to develop innovative seafood products that promote the consumption of neglected fish materials.	Horizon 2020	2022-2025
BIORAS SHRIMP	Aimed to develop, improve, and innovate a bio-secure land based sustainable shrimp culture model to minimise waste, enhance productivity and recover energy and nutrient for additional biomass production.	Horizon 2020	2022-2024

Project	Description	Funding Source	Period
FishEUTrust	Aimed to establish five Co-creation Living Labs to enable innovation and process validation and demonstrate the project's supply chain solutions. Examples of supply-chain innovation include creating sustainable business models, protecting cultural and culinary heritage, short food supply chains, exploiting underused fish species, and innovative engagement activities to stimulate positive consumer behaviour.	Horizon Innovation Actions	2022-2026
Sea2Land	Aimed on improving and adapting nutrient recovery technologies to produce bio-based fertilisers from fish and aquaculture processing by-products.	Innovation Action	2021-2024
FISH MED NET	Train fisheries MSMEs in increasing their diversification and integration potential and favouring the development of new products and services.	ENI CBC MED	2019-2023
FishMPABlue2	Fisheries and Marine Protected Areas, A Partnership for Sustainability in the Mediterranean to assess and quantify its effectiveness in achieving expected results in terms of MPA ecological effectiveness, benefits delivered to small scale fisheries and social acceptance of management measures by stakeholders.	Interreg MED	2016-2019

FUTURE (2025-2030)

Looking ahead towards 2030, a number of key challenges and opportunities persist across the sector.[27] These should be more thoroughly addressed to build sectoral resilience and respond to global shocks, in order to advance towards fully sustainable fisheries and aquaculture in the region:

Addressing the overexploitation of marine resources remains a challenge in the Mediterranean and threat to the biodiversity of the region. Greater enhancement of fishery-related data collection, monitoring and analytical capacity at the national, subregional and regional levels is needed, in order to facilitate the formulation of sound advice for the sustainable management of fisheries and marine aquaculture practices.[28]

This should be coupled with an effective design and implementation of multiannual adaptive management plans and area-based management measures across the region, including through the identification and strengthening of fisheries restricted areas operating on the basis of environmental and socio-economic evidence.

Also, and importantly, more ambitious actions are needed to end illegal, unreported, and unregulated (IUU) fishing - including by strengthening compliance and enforcement measures at national partner country level, as well as fostering regional monitoring, control, and surveillance in a coordinated and transparent manner.[29]

Ensuring the sustainable development of aquaculture, through the innovation and diversification of its production, management, social acceptability, supply- and value-chains, so as to foster its contribution towards sustainable food systems in the region while generating greater added-value and lowering its ecosystem pressure both locally and at regional level.[30]

Although the growth of the sector in this area is largely related to finfish (as discussed in the previous section), in fact, there is a strong potential for a greater diversification in the current practices towards more added-value products (e.g. algae), and overall capturing of greater economic value while reducing environmental pressures (e.g. bio-technologies and new market niches) especially with low-trophic species[31] and minimizing environmental impacts.

Such broader transformation of the aquaculture industry, nevertheless, requires a number of critical factors to be in place, including a greater reliance on the potentials of digitalization and innovation, and the embracement of circular business models through science- and nature-based solutions.[32]

Sustainable fish-feed, including through bio-waste management and micro-algae,[33] digital and optimised monitoring of farming practices (including optimise distribution of food),[34] ecosystem-based approaches, or valorising by-products (towards cosmetics, pharmaceuticals, goods).[35]

Accelerating the energy transition of fisheries and aquaculture[36] towards more resilient, efficient and innovative practices is also pivotal to address a climate transition across the region.

Moreover, the current dependency on fossil fuels makes the sectors vulnerable to energy price increases and fluctuations,[37] reducing their dependence would also benefit the sectors' sustainability. Energy price is in fact one of the major cost items in the fisheries and aquaculture sector, for example in the EU, where the hike in energy prices resulted in marine-diesel prices more than doubling in 2022 compared to average prices in 2021, making a significant part of the EU fisheries fleet was not able to cover their operational costs in 2022.[38]

Similarly, for aquaculture, the increased energy prices are a threat to profitability and viability, either directly through increased energy costs and/or indirectly through higher feed prices and other input costs.[39]

27 Ibid
28 European Parliament (2019) Fisheries policy: Latest developments and future challenges
29 FAO/GFCM (2021) 2030 Strategy for Sustainable Fisheries and Aquaculture
30 Ibid
31 Nature (2021) A 2°-year retrospective review of global aquaculture. More information available at: https://www.nature.com/articles/s41586-021-03308-6
32 Responsible Food (2021) An introduction to circular economy principles in aquaculture
33 EITFood (2023) Converting clean energy into sustainable microalgae-based feed ingredients for fish aquaculture. More information available at: https://www.eitfood.eu/news/converting-clean-energy-into-sustainable-microalgae-based-food
34 Cornell University (2023) Feeding control and water quality monitoring in aquaculture systems: Opportunities and challenges
35 AdriAdapt (2022) Diversification of fisheries and aquaculture products and systems
36 European Commission (2023) Press release - Transition to clean energy and ecosystem protection for more sustainability and resilience
37 Ibid
38 EU Communication (2023) Energy transition of the fisheries and aquaculture sector
39 Ibid

Looking ahead, the sector seems to be facing two synergetic turnaround strategies: on the shorter-term, an increase shift towards greater energy-efficiency approaches, including through a decrease fuel intensity technologies and models, while in the mid-longer terms a thorough although gradual switch towards renewable and low-carbon energy sources (technologies and business models) including a full-mode embracing of circular models of feeding, production and management of resources.[40]

Building capacity and providing technical support at the national and subregional levels, to ensure greater policy commitments as well as technical and managerial ability of local practices.[41]

All the abovementioned trends require a shift in the overall capacity, ability and flexibility of the sector towards embracing sustainable and disruptive innovation – from policymakers to practitioners across the different activities and branches of Mediterranean value chains.

Sectoral stakeholders have called for more flexibility in the financial support available[42] to test and develop innovative solutions, while policymakers are faced with new radical challenges in supporting the energy transition across the region.

This would include leapfrogging into new approaches, particularly but nonexclusively in non-EU countries, to be able to bypass 'current standards' towards the implementation of fully sustainable practices – for example when it comes to the establishment of new aquaculture operations.

Technical and scientific support should be therefore further adapted to the needs of each subregion, to be able support policy commitments, tailor capacity development and boost scientific cooperation and marketability or emerging innovation.

More broadly, greater capabilities should be put in place as to allow the large variety of sectoral stakeholders[43] to build multi-level alliances addressing common environmental, economic and social priorities – hence by integrating fisheries and aquaculture into a wider perspective.[44]

Also, small-scale fisheries should be fully acknowledged and further supported as strategically vital for ensuring the food security, sustainable livelihoods and poverty alleviation of coastal areas, across the Mediterranean region and particularly on the southern shore.[45]

Artisanal fisheries are essential to coastal communities' cultural heritage and provide employment and the public supply of high-quality fish to millions of people.

40 Ibid
41 FAO/GFCM (2021) 2030 Strategy for Sustainable Fisheries and Aquaculture
42 EU Communication (2023) Energy transition of the fisheries and aquaculture sector
43 Ministries, international Organizations and programmes, academia and research institutions, civil society organizations, professional associations, cooperatives and the private sector
44 FAO/GFCM (2021) 2030 Strategy for Sustainable Fisheries and Aquaculture
45 As also discussed in previous meetings of the UfM Regional Platform on Sustainable Blue Economy

EMPLOYMENT

Regarding fisheries, the sector offers a source of jobs for 158 000 Mediterranean on board fisheries workers (both part-time and full-time),[46] with limited if no data available for non-vessel-based[47] employment and a steady decline (about 6%) compared to 2020.[48]

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 fisheries sector a source for about Mediterranean 500,000 jobs overall.

Most recent estimates for aquaculture offer about 300,000 direct and indirect jobs in the Mediterranean,[49] hence catching up potentially with the traditionally much larger workforce of fisheries.

Over 80% of total employment in the region comes from just six countries (Tunisia, Türkiye, Egypt, Italy, Greece and Morocco) and with a strong prominence of workers in Small Scale Fisheries (about 62% of total employment in the sector although only representing 26% of total revenue), normally representing small-to-medium enterprises (SMEs), investing relatively low capital, and mostly are family-owned, with the owners directly involved in the fishing activity. [50]

Note that these values are inverted when it comes to the less labour-intensive but more profitable industrial fisheries active across the Mediterranean.[51]

Employees in fisheries are still largely represented by lower degrees of education and typically elders,[52] while supported by a frequently "invisible" work of women in the Mediterranean.[53]

Whilst no breakdown data are available for the Mediterranean, if we consider global trends and data women are estimated to account for fewer than 15% of those directly employed in capture fisheries and aquaculture, while in some countries youth aged 20-39 account for the majority of workers in the aquaculture sector.[54]

Some global patterns also emerge in the division of labour across age and gender in the aquaculture sector, with young men largely engaged in fish production and young women in processing and other pre- and post-harvesting work.[55] Some potentials for more added-value and appealing professional career are importantly offered by addressing the challenges foreseen by the sector – hence notably through a greater need for new managerial and technical (innovation-based) competencies and skills, increasingly needed across the different phases of production.

Several EU-funded initiatives focus on the development of skills and attractiveness of the fisheries and aquaculture sectors among young professionals. The BAPSI project created a blue academy formed by blended courses targeting professionals of the seafood industry.[56]

In order to fill in the gaps of lack of structured, continued collaboration between industry and educational/ VET institutions and lack of "skills ecosystems" in the aquaculture sector, the BLUEAQUAEDU supports the digital, green, soft, transversal, inter-/multi-disciplinary, managerial, entrepreneurial and project management skills of the next generation aquaculture graduates through a gamification approach and distance learning platform.[57]

An overview of the different type of skills needs and job existing in the sector is provided on the next page.

46 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
47 Pre- and post-harvest sectors, gleaners and other shore-based activities
48 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
49 PlanBleu (2022) Aquaculture in the Mediterranean
50 LIFE Platform (2020) Social and Economic Aspects of Mediterranean Small-Scale Fisheries: a snapshot of three fishing communities
51 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
52 European Parliament (2021) Attracting a new generation of workers to the fishing industry and generating employment in coastal communities
53 FAO/GFCM (2023) State of Mediterranean and Black Sea Fisheries
54 ILO (2022) Global employment trends for youth
55 Ibid
56 More information on the BAPSI project: https://bapsi.eu/programme/
57 More information on the BlueAquaEdu project: https://blueaquaedu.eu/

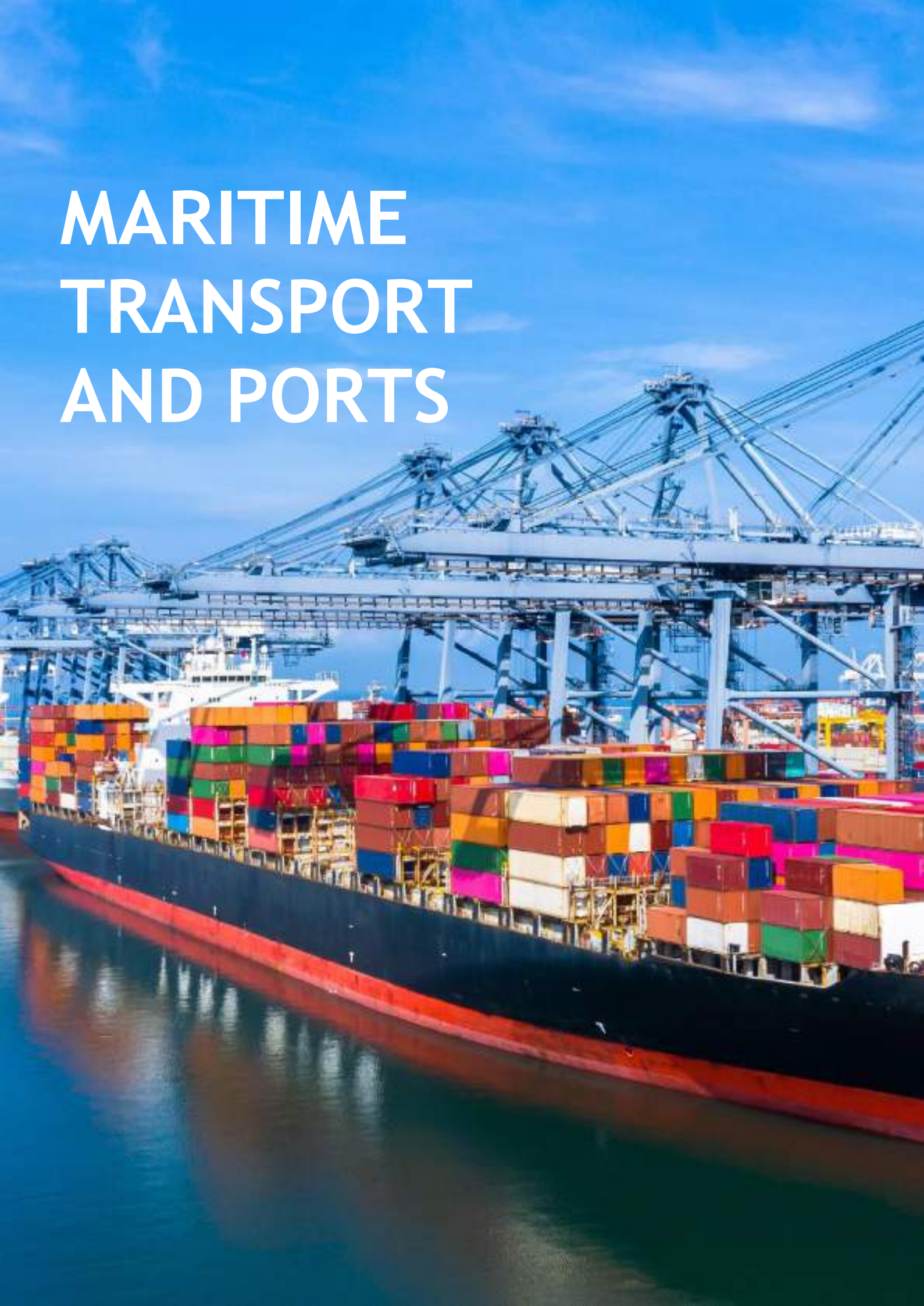
Table 3 Skills needed for the Aquaculture and Fisheries industry

Hard skills	Soft skills
• Knowledge of recirculating aquaculture systems (RAC), integrated multitrophic aquaculture (IMTA) and offshore aquaculture • Fisheries management: stock assessment methods, compliance with regulations • Marine biology • Competency in remote sensing, GIS, and aquaculture automation • Implementation of biosecurity protocols and disease management strategies • Data collection, analytics, and management • Aquatic health management • Business management • Equipment specialists	• Communication • Problem-solving • Flexibility and adaptability • Collaboration competences • Leadership • Policy advocacy • Negotiation • Creative thinking and innovation • Decision-making • Environmental awareness

Table 4 Skills needed for the Aquaculture and Fisheries industry

On land / office work	Offshore work
• Aquaculture technicians (management, maintenance) • Fisheries managers • Data analysts • Marine biologists, researchers • Aquatic Health Specialists • Aquaculture engineers • Policy advisors • Community outreach coordinators • Aquaponic specialists • Fish and seafood Quality Assurance Specialists • Aquaculture farmers • Hatchery managers • Veterinarian • Livestock supervisor • aquatic food brokers • Water quality advisor	• Aquaculture technicians (management, maintenance) • Fisheries managers • Engineers for offshore systems) design, installation, maintenance) • Skippers • Fishers

MARITIME TRANSPORT AND PORTS



INTRODUCTION

Ports and maritime transport services handle more than 80% of global trade volumes. To participate in global value chains, Mediterranean countries rely on well-connected ports and cost-effective shipping services.

In addition to port and shipping services, Mediterranean economies also benefit from the provision of services and hosting of maritime activities. Some countries in the region are important players in ship ownership, registration, and transshipment services.[58]

The sector represents one of the most prominent blue economy activities for the Mediterranean, but it is also exposed to market fluctuation and international crises due to its link to the global supply chains.

Such characteristics make maritime transport a relatively volatile source of growth and jobs for the region, in a world increasingly exposed to disruptive shocks.

Decarbonising maritime transport is among the top challenges in 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. Starting in 2023, the International Maritime Organisation's (IMO) CII regulation is requiring that vessel owners record their individual ships' energy efficiency.

Vessels' efficiencies are graded from A to E. Using biofuels is one of the ways vessels with D or E ratings could improve their efficiencies. Furthermore, as of 1 May 2025, the Mediterranean Sea will effectively become an Emission Control Area (ECA) for sulphur oxides (SOx) under MARPOL Annex VI Regulation 14, where vessels will be required to burn marine fuel with Sulphur content capped at 0.1pc, down from 0.5pc Sulphur.[59]

The region is expected to undertake substantial changes in the near future. In order to address such challenges, the sector must accelerate the market readiness for 'zero-emission' technologies, which in turn implies the mobilisation of significant investments in equipment and infrastructures across the sea basin.

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

Box 1 Emission Control Area (ECA) for the Mediterranean

The Mediterranean Sea has been designated as an EMC for sulphur dioxide which will take effect from May 1, 2025. It becomes the fifth area worldwide to be designated as an ECA. This action is the result of extensive collaboration between Mediterranean countries and the EU, facilitated by the Barcelona Convention, the International Maritime Organization (IMO), and REMPEC.

The proposal was finalised at the 79th session of the IMO Marine Environment Protection Committee in 2022 and was again emphasised at the virtual Ministerial Conference on Transport in February 2023, wherein the entry into force of an EMC in the Mediterranean was recommended by 2025. Amendments to MARPOL Annex VI to codify the establishment of the ECA came into force on May 1, 2024, giving ship operators a year to prepare for the introduced cap on sulphur dioxide content in marine fuel.

The initiative to cap sulphur dioxide content in marine fuel is expected to cut emissions by almost 80%, bringing significant benefits not only for the environment but for human health. Lower levels of air pollution will prevent acidification in the aquatic and land ecosystem, and it is estimated that 1,100 premature deaths and 2,300 cases of asthma will be prevented in the region each year as a result of the ECA.

58 Hoffmann, Jan (2021) Chapter 5: Shipping in the Mediterranean
59 DNV (2023) Mediterranean Sox ECA, and heavy fuel oil ban in the Mediterranean

OVERVIEW

Global maritime trade volume declined by 0.4 % in 2022 to 12,027 million tonnes, down from 12,072 million tonnes in 2021. 2022 performance reflects a normalisation after an exceptional market surge in 2021, recovering from the COVID-19 pandemic that negatively affected maritime trade volumes in 2020.[60]

Several factors influenced the weak growth of maritime trade flows in 2022, including weaker global economic growth, high inflation affecting consumer spending, and the disruption caused by the war in Ukraine.[61]

Three continents border the Mediterranean Sea: Africa, Asia, and Europe. The main global maritime route crosses the Mediterranean Sea from Suez to Gibraltar. The Mediterranean Sea is a global hotspot for commercial and passenger traffic, while most of the former is internal (about 58%).[62]

In 2021, the EU Mediterranean countries accounted for 69% of the short-sea shipping weight of goods transported in the EU. This constitutes an increase of 6 percentage points compared to 2019.[63]

This is an indication that EU Mediterranean countries have become more integrated as a reaction to the COVID-19 pandemic compared to other regions in Europe, especially due to the Motorways of the Sea, the maritime component of the Trans-European Transport Network.

Asmaritime traffic and offshore oil and gas (O&G) exploration and production have thus reached significant levels, their pollution generates a variety of different pressures on the marine environment: i.e. loss or discharge of solid waste contributing to pollution by marine litter, emissions of gaseous pollutants and particles into the atmosphere, emission of continuous and impulsive underwater noise and vibrations, discharge of oil and other contaminants, and introduction of invasive species through ballast water and hull fouling.

While it is now more important than ever in the context of climate change to provide an effective and coordinated response to these key issues for present and future generations, the various transport players in the Mediterranean have decided to turn to a common vision: the Mediterranean Strategy for the prevention, preparedness, and response to marine pollution from ships (2022-2031).

The Mediterranean, starting on 1 May 2025, will become an Emission Control Area (ECA), where vessels will be required to burn marine fuel with Sulphur content capped at 0.1pc, down from 0.5pc Sulphur.[64]

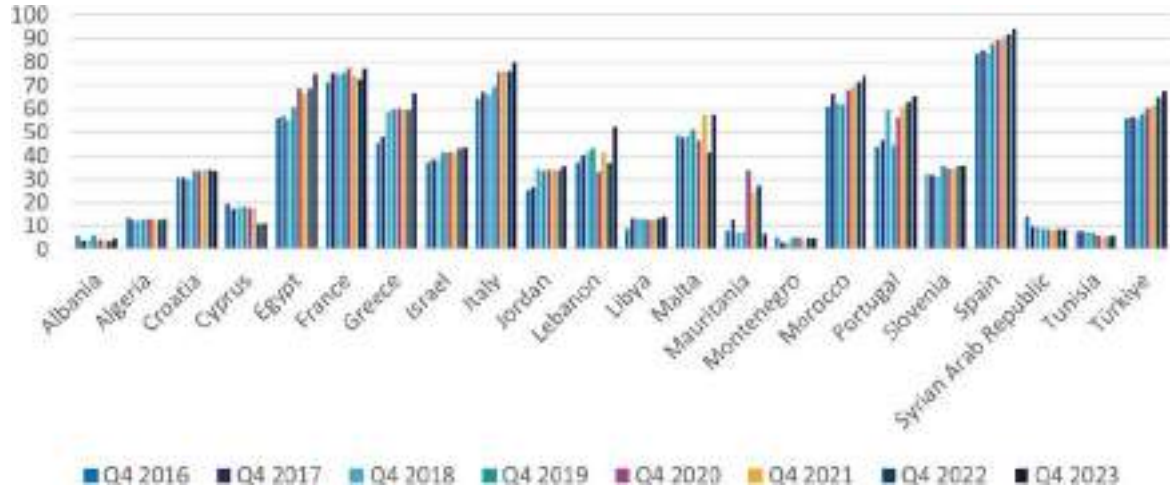
Starting in 2023, the International Maritime Organisation's (IMO) CII regulation is requiring that vessel owners record their individual ships' energy efficiency. Vessels' efficiencies are graded from A to E. Using biofuels is one of the ways vessels with D or E ratings could improve their efficiencies. At the same time, some initiatives like POSEIDON MED[65] are focusing on liquefied natural gas (LNG) as a fuel in the short term, considering the heavy traffic in the region but also the expansion of cruise ship tourism.

Trade in the Mediterranean countries is highly dependent on maritime connectivity. Maritime connectivity is a comprehensive concept that considers different dimensions (e.g. the network of maritime connections between ports, port transit, infrastructure capacity and hinterland connections) as well as the actors and processes that make up the maritime transport of goods.[66] Maritime connectivity varies among the Mediterranean countries.

An analysis carried out by the Centre for Transportation Studies for the Western Mediterranean (CETMO) on Maritime connectivity in the Western Mediterranean shows that a clear distinction can be drawn between the northern shore, with its high level of connectivity of regular container lines, and the southern shore, with low scores, except for Morocco, which boasts connectivity comparable to that of European countries.[67]

60 United Nations Conference on Trade and Development. (2023) Review of Maritime Transport 2023
61 ICC (2023) ICC 2023 Trade Report: A Fragmenting World
62 Docks the Future (2020) Ports Relationship in the Mediterranean region: future cooperations, competences and competitions
63 Eurostat (2023). Short sea shipping - country level - gross weight of goods transported to/ from main ports
64 DNV (2023) Mediterranean Sox ECA, and heavy fuel oil ban in the Mediterranean
65 European Energy Innovation. (2020).POSEIDON MED II Project Sets The LNG Pathway For The Eastern Mediterranean Decarbonized Future Avalailable at: https://www.europeanenergyinnovation.eu/Latest-Research/Winter-2020/POSEIDON-MED-II-Project-sets-the-LNG-pathway-for-the-Eastern-Mediterranean-decarbonized-future
66 CETMO (2022) Maritime Connectivity in the Mediterranean
67 Ibid

Figure 7 Liner Shipping Connectivity Index in Mediterranean countries



Source: own based on Unctadstat datacentre (2024)

The figure above (figure 7) shows available data for Mediterranean countries for the liner shipping connectivity index (LCSI), which is an index provided by the United Nations Conference on Trade and Development, which indicates a country's integration level into global liner shipping networks.

The LSCI is an index set at 100 for the maximum value of country connectivity. It shows that European countries such as Spain, Italy, and France are among the frontrunners in the Mediterranean alongside Egypt and Morocco on the southern shore and Türkiye in the east of the sea basin.

Customs clearance is the main difference between Mediterranean countries that are part of the EU and non-EU countries. European countries form part of the European Union and the customs territory of the Union, which means that trade between these countries is considered intra-community and eliminates customs control.

The non-EU countries are sovereign and independent countries with a very heterogeneous profile. Trade between countries on different shores of the Mediterranean is subject to bureaucratic procedures and formalities of imports and exports, given that these countries do not belong to the same customs system.[68]

The capacity and efficiency of connections varies in the region and leads to infrastructure limitations on accessing ports that turn into bottlenecks in connections with the hinterland.

As far as the arrival or departure of goods from the port area is concerned, road transport dominates connections with the hinterland, which strengthens the single-modal nature of this type of transport. However, ports and countries in the region are committed to multimodality as a development strategy to improve operations and connection speeds. They are focusing on improving rail connections and introducing new modes of transport. The strategies of European countries are designed to improve and consolidate multimodal options, especially rail because of its contribution to the decarbonisation of transport.[69]

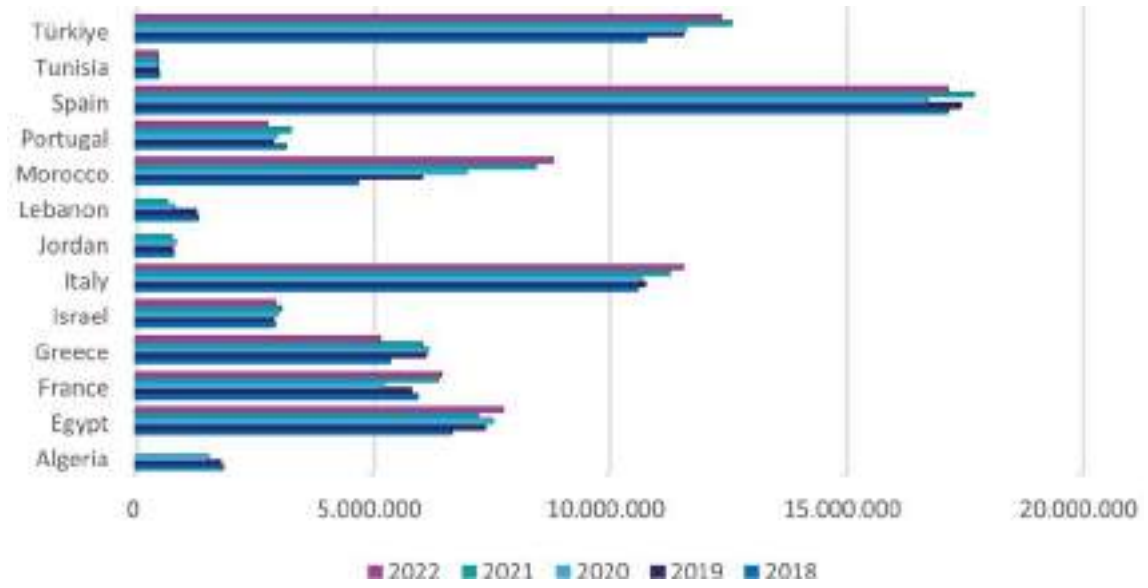
The figure on the next page (figure 8), showcasing the volume of containers in a selected number of countries with available data, indicates that hubs can be found in the north of the region (Spain and Italy), in the south of the region (Morocco and Egypt), and in the east of the region (Türkiye and Greece).

Data on the port level regarding the volume of containers in ports shows that Tanger Med has taken over the leadership in the Mediterranean since 2020 as shown in figure 9, while in countries like Spain and Italy, various bigger ports exist distributing the cargo more than in Morocco for instance.

68 Ticó, Enric. (2023) Towards Enhanced Connectivity and Sustainability in the Mediterranean Transport and Logistics Sector: Trends in Trade, Maritime Transport, and Sustainability

69 CETMO (2022) Maritime Connectivity in the Mediterranean

Figure 8 Volume of containers (TEU), country-wide



Source: own elaboration (2024)

Figure 9 Evolution of volume of containers (TEU) by selected big ports in the Mediterranean

Source: own elaboration (2024)

Construction et réparation navales

The Mediterranean is home to some important shipyards and provides the relevant expertise and skills for construction and repair.[70]

Many Mediterranean shipyards are now seeking to meet the demand for smaller expedition and luxury vessels.[71]

The shipbuilding and repair sectors are currently undergoing a remarkable period of expansion across the Mediterranean, especially when it comes to cruise ships since this segment of tourism continues to rise.[72] Europe's largest shipbuilder Fincantieri is based in Italy.[73]

The Mediterranean's repair scene has also expanded.[74]

A sectoral study[75] on ship repair yards in the Mediterranean found that 19% of ship repair yards are located in the Mediterranean basin.

The Mediterranean countries are the largest region in terms of ship repair yards (around 70 in total) after Northern Europe. This is due to their geographical location and climate conditions, which allow them to operate throughout the year.

Almost 90% of the existing shipyards are concentrated in the north, partly due to the historical tradition and the higher qualification of the workforce. Türkiye is the country with the highest number of repair yards due to low costs and skilled labour. Turkish yards specialise in structural repairs. Italy and Spain are the countries with the highest number of repair yards after Türkiye, despite higher costs, due to their specialisation. As for North Africa, there are currently few repair yards and the ones that do exist tend to focus on small vessels.

Ship repair yards have a great potential to develop circular industrial models for repair, maintenance, refurbishment, dismantling and component collection, extending the life of products and materials. The principle of circular economy is to generate neither waste nor pollution. Environmental impacts can be influenced and very significantly reduced contributing strongly to a sustainable blue economy.[76]

Pressures

In 2022, emissions from the international shipping sector grew by 5%, continuing the rebound from the sharp decline in 2020, and are now back to 2017-2018 levels.[77]

The Mediterranean region is facing environmental problems such as pollution, biodiversity loss and degradation of land and marine ecosystems.[78]

Pressures on local ecosystems from maritime transport come in the form of potential oil and chemical pollution, marine litter (e.g., plastic, glass, metal, paper and wood, ghost fishing gear and equipment), air pollution, underwater noise and non-indigenous species introduction.[79]

Operational pollution from maritime transport is a substantial source of oil pollution in the Mediterranean. It is estimated that up to 1,500-2,000 operational oil spills occur annually in the basin. The distribution of oil spills is well correlated with the main shipping routes, which cross the Mediterranean from east to west, linking large ports.[80]

Ship emissions are a major contributor to air pollution in the Mediterranean.

Up to 57% of all emissions from international shipping in Europe occur in the Mediterranean. In the Mediterranean, about two-thirds of the emissions come from EU waters, where most of the maritime traffic is concentrated.

Although emissions from ships in port represent only a small fraction of global emissions from shipping, they can have a significant environmental impact on Mediterranean coastal regions, which often have ports close to urban and industrial centres.[81]

70 CPMR Intermediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP. (2022). A Circular Blue Economy for the Mediterranean: Current practices and opportunities
71 Bond, Mary (2018) Mediterranean cruise shipping and repairing sectors establish reputation as global leaders
72 CPMR Intermediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP. (2022). A Circular Blue Economy for the Mediterranean: Current practices and opportunities
73 European Commission (2019) Mergers: Commission to assess acquisition of Chantiers de l'antique by Fincantieri
74 Bond, Mary (2018) Mediterranean cruise shipping and repairing sectors establish reputation as global leaders
75 Ruiz de Real, Pablo & Erdozain, Ibai. (2020) Mediterranean Shipyards Market: Factors that drive the selection of a shipyard
76 CPMR Intermediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP. (2022). A Circular Blue Economy for the Mediterranean: Current practices and opportunities
77 IEA. (2022) International Shipping
78 Ali, E. et al., (2022) Cross-Chapter Paper 4: Mediterranean Region. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change
79 Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (2021) Study on trends and outlook of marine pollution from ships and activities and of maritime traffic and offshore activities in the Mediterranean
80 Ibid
81 Ibid

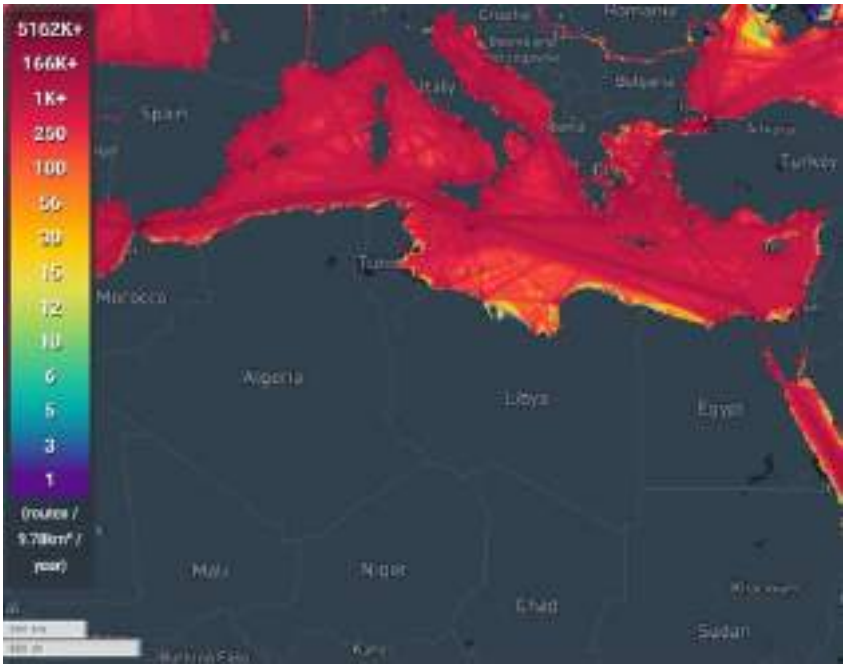
The Mediterranean countries are acting to address the impacts of marine pollution on the region.The Mediterranean Strategy for the Prevention of, Preparedness, and Response to Marine Pollution from Ships (2022-2031) was adopted by the Parties to the Barcelona Convention, in 2021[82] and sets seven ambitious Common Strategic Objectives:

1. Addressing operational, illegal and accidental oil and Hazardous and Noxious Substances pollution from ships,
2. Supporting the development and implementation of innovative global solutions to mitigate and respond to climate change,
3. Reduction of air emissions from ships,
4. Prevention and reduction of litter entering the marine environment from ships, Eliminating the introduction of non-indigenous species by shipping activities,
5. Achieve a well-managed safe and pollution free Mediterranean, with integrated marine spatial planning and designation of special areas, where shipping activity has a limited impact upon the marine environment
6. Identify and understand collectively emerging issues related to pollution from ships in the Mediterranean, and define required actions to address issues identified

There is strong awareness globally of the negative impact of greenhouse gas emissions from international shipping. In July 2023, the International Maritime Organization adopted the 2023 IMO Strategy on Reduction of GHG Emissions from Ships with enhanced targets to tackle harmful emissions.[83]

Since October 2023, geopolitical instability has affected operations in the Suez Canal, which connects the Mediterranean Sea to global trade routes.[84] Geopolitical crises have an impact on global supply chains and, especially when they are close to the Mediterranean, have a substantial impact on maritime trade and transport in the region. Shipping trends are driven by global trade activities that have been severely affected by disruptions in the supply chains. Geopolitical tensions will continue to affect supply chains and trade dynamics.[85]

Figure 10 Density of Maritime traffic



Source: Marine Traffic

82 REMPEC (2019) Decision IG.25/16 Mediterranean Strategy for the Prevention of Preparedness, and Response to Marine Pollution from Ships (2022-2031)
83 IMO (2023) Revised GHG reduction strategy for global shipping adopted
84 Shkuro, S. (2024) Impact of Red Sea & Suez Canal Disruption on Global Supply Chain
85 ICC (2023) ICC 2023 Trade Report: A Fragmenting World

FUTURE (2025-2030)

Global maritime trade has recovered from the COVID-19 pandemic and UNCTAD projects it to expand by over 3 % during the 2024-2028 period.

The Mediterranean Strategy for the Prevention of, Preparedness, and Response to Marine Pollution from Ships as well as the 2023 IMO Strategy on Reduction of GHG Emissions from Ships address key issues of sustainability of maritime transport going forward. Reduction of pollution and emissions is key.

The purpose of adapting transport to climate change is to protect infrastructure and operations from the current and future effects of climate change.[86]

Maritime transport and the trade industry will have to deal with risks from storm surges and sea level rise that may disrupt port operations.[87]

The green transition of maritime transport is crucial and needs to address a wide range of key points, from reducing greenhouse gas emissions to decreasing its impact on marine ecosystems.[88]

The transport sector will face a global challenge to improve its environmental sustainability. For the shipping industry, this challenge includes limiting pollutant emissions and embracing the energy transition to alternative, more environmentally friendly fuels.

The trend towards greater sustainability in transport will ultimately have an impact on shipping. The global reduction of emissions will continue to have an impact on ships (engines, technology), fuels (refuelling) and port requirements (electrification).

Differences between Mediterranean countries may lead to technological gaps and conditioning factors that affect the way maritime transport operates.[89]

The decarbonisation of maritime transport, apart from contributing to a reduction of greenhouse gases, will also reduce water pollution and underwater noise.[90]

The complexity of the challenge in adapting to green fuel is due to the fact that it involves the shipping companies as much as port authorities, as the latter are becoming drivers in offering sources of green fuels, hence holding the responsibility of allowing a wide range of technical solutions to be available to different operators.[91]

In an analysis, the Centre for Transport Studies for the Western Mediterranean[92] identified regional shortcomings in the resilience and adaptation of transport to climate change. Financial resources devoted to transport adaptation are lacking and are rather directed to other climate change adaptation priorities in the region.[93]

Economic stakeholders are concerned about two issues related to new environmental requirements in maritime transport: the high volume of investment associated with meeting environmental requirements, and the lack of a clearly defined and agreed technological commitments, taking into account that this should be a coordinated investment between port authorities, shipping companies, and the countries of the region.

Resilience of supply chains has become increasingly important in the last years and has a significant potential impact on the region as it has triggered a process of relocation and regionalisation.

Taking advantage of this opportunity will require greater maritime connectivity in the Mediterranean. The impact of regionalisation will depend, among others, on its ability to provide supply chains with an efficient, multimodal, and interconnected transport system.[94]

The future of ports relies on digitalisation to serve as hubs for clean energy, circular economy and waste management, logistics, industrial clusters, and for communication through submarine cables.

86 Selfa, Jordi. (2024) The Resilience and Adaptation of Transport to Climate Change in the Mediterranean
87 Eco-Union (2024) A sustainable blue economy for the Mediterranean: challenges, opportunities and policy pathways
88 Ibid
89 CETMO (2022) Maritime Connectivity in the Mediterranean
90 Eco-Union (2024) A sustainable blue economy for the Mediterranean: challenges, opportunities and policy pathways
91 Macarena Larrea Basterra (2022) The Role of ports in the Energy Transition - Executive Summary
92 The Resilience and Adaptation of Transport to Climate Change in the Mediterranean https://www.iemed.org/publication/infrastructures-energy-and-digitalisation-pillars-for-the-sustainable-development-of-transport-in-the-western-mediterranean/
93 CETMO. (2022). Maritime Connectivity in the Mediterranean
94 Ibid

The potential of smart digital solutions and systems to achieve a greater level of optimization of operations is also remarkable.[95]

Ports can become 'blue hubs', by becoming the main platform for the development of new blue companies, Med Ports have the opportunity to diversify their revenue sources and work towards a sustainable ocean economy. Ports are one of the primary interfaces with the ocean, which means they will play a strategic role as launchpads for a new generation of blue companies.

However, there are some related challenges and risks. The lack of interoperability between technologies in different countries is a main challenge to overcome. The exchange of knowledge and experience can help all actors in the transport system to embrace these changes without leaving anyone behind.

Further work is needed to ensure the harmonisation and integration of digital platforms used in ports, as well as the integration of all maritime stakeholders in these platforms.[96]

A common regional position in the Mediterranean on the sustainability of maritime transport needs to be defined. Successful digital transformation processes should be facilitated and promoted to bridge the digital maturity gap of maritime connectivity in the region.

Awareness should be raised on the impact of climate change on the transport system and the measures that need to be taken to adapt.[97]

Most of the world's major ports are looking at the Circular Economy as a way to address their own sustainability challenges. The Circular Economy fosters the promotion of synergies between economic and public stakeholders, and the creation of closed waste cycles for generating value through the recycling and the re-using of materials and energy starting from the design of products. Industrial clusters already present in ports can promote these synergies.[98]

The Loop-Ports project [99]on a circular economy network of ports has identified opportunities for ports and maritime transport in Europe including the Mediterranean Sea to become more circular around three main themes:

1. Circularity in port assets and equipment: optimising and extending the life of port assets, infrastructure and equipment (e.g. buildings, cranes, quays, buoys, etc.) through maintenance and smart use (e.g. sharing, renting, etc.), including green procurement;
2. Circularity of materials within ports: new uses for potential waste generated by port activities (e.g. ship waste and by-products of port-based industries) and application of circular business models (e.g. recycling, upcycling, repair) to be implemented within ports;
3. Ports that enable other industries - both onshore and offshore - to move towards circular practices by developing new activities that link the supply and demand of material flows in ports in a circular way.

The companies operating the maritime services appear as the main actors in the process of promoting new relations between the ports of the Mediterranean. The involvement of the other actors related to maritime transport may contribute to improving and accelerating the process of creation and establishing new routes and therefore to improve maritime connectivity in the Mediterranean Sea.[100]

Commitment to multimodality combining transport on sea with transport on the road and on rail, as an element of efficiency and sustainability, represents the main challenge of the connection with the hinterland for ports in Mediterranean. This commitment has to adapt to the situation and particularities of each country. Vertical integration processes, as they are introduced in the region, can favour the efficiency of this multimodality, but at the same time they may mean market control by a limited number of players.[101]

95 Eco-Union (2024) A sustainable blue economy for the Mediterranean: challenges, opportunities and policy pathways
96 CETMO (2022) Maritime Connectivity in the Mediterranean.
97 Ibid
98 CPMR Intermediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP (2022) A Circular Blue Economy for the Mediterranean: Current practices and opportunities
99 Ibid
100 CETMO (2022) Maritime Connectivity in the Mediterranean
101 Ibid

Table 5 Projects related to Maritime Transport and Ports

Project	Description	Funding Source	Period
TECHLOG	The project Technological Transfer for Logistics Innovation in the Mediterranean area (TECHLOG) with a budget of EUR 3.100.000 aims to strengthen research-industry links in the maritime transport sector by establishing a permanent cross-border EU-Med space where research organizations and maritime transport industries co-create, test and share new Technology Transfer Initiatives based on advanced simulation technologies.	ENI CBC MED	2021 - 2024
ZboxBlueLogistics	The project Foldable Shipping Containers for Sustainable Blue Growth (ZboxBlueLogistics) with a budget of EUR 2.157.570 has designed foldable containers to avoid empty containers travels towards changing logistics into a more efficient and sustainable supply chain. Zbox saves 80% of the space allocation at ports and 80% of all the costs directly related to container size: maritime transport cost, handling cost, and storage costs; it reduces repositioning costs by 50% thanks to the easy folding mechanism and standard equipment used in the operation. 80% of CO2 emissions are reduced similarly.	EMFF	2020 - 2023
GREEN MARINE MED	The project Mediterranean Green Shipping Network: Linking Ports, Industries, Investment and Innovation for Monitoring and Technology Foresight on Green Shipping in the Mediterranean (GREEN MARINE MED) will bring together, engage and mobilise the comprehensive Mediterranean Green Shipping stakeholder community, representing the full value chain including actors from the full vessel community, ports and marinas, fuel and energy, as well as finance, investment, innovation and other stakeholders.	EMFAF	2023 - 2025
GreenMED	Green Shipping Pathways Towards a Clean Energy Transition in the Mediterranean (GreenMED) is a regionally oriented project aiming to effectively support green shipping efforts in the Mediterranean Sea basin, by promoting plausible scenario-based decarbonisation pathways. The GreenMED project will elaborate on existing studies of maritime alternative fuels and green shipping technologies to attain the energy consumption of maritime transportation chain in the Mediterranean, a process which will be combined with the full mapping of the fuel supply chain.	EMFAF	2023 - 2025
POWER4MED	The POWER4MED project aims to drive the transition toward carbon neutrality in shipping through the development of a POWER4MED Support Structure. This will see the development of a toolkit and establishment of a Support Team comprising of multidisciplinary experts to facilitate the transition in the sectors of fishing vessels, commercial vessels and marinas. This project is focused in the Southern Mediterranean countries Algeria, Egypt, Turkiye and Libya.	EMFAF	2023 - 2025

Project	Description	Funding Source	Period
Blue Ports	To enhance the skills and capacity of human capital within the ports' ecosystem, by introducing a mutually acknowledged training and certification scheme at European level. This novel qualification scheme, in accordance with ISO/IEC 17024, offers a competitive professional advantage to blue economy's workforce and supports ports to minimise their environmental footprint and drive their green transition.	EMFAF	2023 - 2025
LIFE4MEDECA	The LIFE4MEDECA project aims to build consensus and awareness for the creation of an Emission Control Area (ECA) in the Mediterranean. LIFE4MEDECA therefore intends to accompany the process of confirming the Low Sulphur Emission Area in Mediterranean waters over the coming years, and also to contribute from a technical and scientific point of view to demonstrating the human and environmental impact of more sustainable shipping.	LIFE	2021 - 2024

EMPLOYMENT

The marine transport sector is facing labour shortages in the Mediterranean. Training curricula needs to be adapted to the needs of the labour market and be fit to a sector in an ongoing transition, in which the green and digital transitions demand adaptability, innovation and willingness to learn.

As indicated in this report, for example, new technologies are essential to make maritime transport activities more sustainable, to reduce environmental impacts, to improve circularity, and to reduce overall economic costs of maritime transport activities.

And yet, innovation cannot be assured without a consistent effort to upgrade existing skills through effective professional education and training schemes. Improved vocational training can also provide youth at risk of educational neglect with skills needed for the maritime transport sector.

It is therefore essential to adapt the current skills of the workforce to new emerging employment needs including digital and green skills in the sector.

Up- and re-skilling is needed in EU and non-EU countries of the Mediterranean. In this sense, The EU-funded project SkillSea[102] urged that maritime professionals need to be up- and reskilled on a large scale.

In addition to this, the Blue Ports project[103] is working on mutually acknowledged training and certification schemes at European level to offer a competitive professional advantage to blue economy's workforce.

Technology is transforming maritime education and training into more flexible, on-demand formats. E-learning and new technologies like virtual reality (VR) and simulators enable seafarers to access training and assessments remotely, anytime and anywhere.

These tools enhance communication, process visualization, and creative expression. Simulator-based learning helps seafarers acquire contextual knowledge and teamwork skills such as critical thinking and leadership. Additionally, technology supports part-time and distributed learning, even while seafarers are at sea.[104]

Some excellent practices in innovative training approaches exist. For example, the Escola Europea – Intermodal Transport[105] is a European training center that serves as a leading authority in intermodal transport and sustainable logistics advancing sustainable logistics practices in Europe by offering innovative educational programmes across the Mediterranean.

Other EU funded projects have tackled the existing gaps and needs of higher education by developing a Joint Master course in Maritime Logistics Engineering and Management.[106]

The sector is a strongly male-dominated industry. Globally less than 2% of seafarers are women while ship owning companies have the highest inclusion of women where 34% make up the taskforce according to an IMO survey.[107]

The green and digital transitions of the sector as well as less reliance on tough manual labour due to technologies have the potential to greater opportunities for employing youth and women.

There is an increasing shortage of seafarers, and the sector cannot afford to exclude half of humanity from the pool of employment, so it must find a way to make maritime careers attractive to women and girls. Customer-facing maritime industries, cruise, and passenger, present the biggest opportunities for women seafarers.[108]

The wide areas with future transformational potential imply greater offers in research and innovation (new business models) as well as marketing and international relations, to leverage the current level of professionalisation across the two shores of the Mediterranean.

Rapidly emerging technologies, the digital transformation of the sector, and an increased focus on sustainability require future-proof skills.

102 SkillSea (2023) Press release - Substantial need for Up and ReSkilling Maritime Professionals
103 Funded by the European Maritime, Fisheries and Aquaculture Fund
104 Sea of Experience (2020) Future skills and new education trends in the Maritime sector
105 Based in Spain and Italy
106 More information available at: https://grupoqualiseg.com/en/marlem-en/
107 Nastali, Ines & Bartlett, Charlie (2021) Women In Maritime Survey 2021
108 Ibid

When appropriately integrated in maritime education and training, including life-long learning, new skills (digital, green, and soft management) support mobility and can enhance the attractiveness of a career in shipping.

The following competencies and capabilities are being identified as needed in the future on the maritime sector:[109]

- Logistics and optimisation methods to achieve high utilisation of ships
- Operation of complex hybrid and zero emission machineries
- Future onboard power and energy production
- Calculation and documentation of emissions
- Performance management systems

As a direct project outcome of SkillSea, nine European maritime education and training providers have launched the Maritime Education and Training Network (MET-NET).

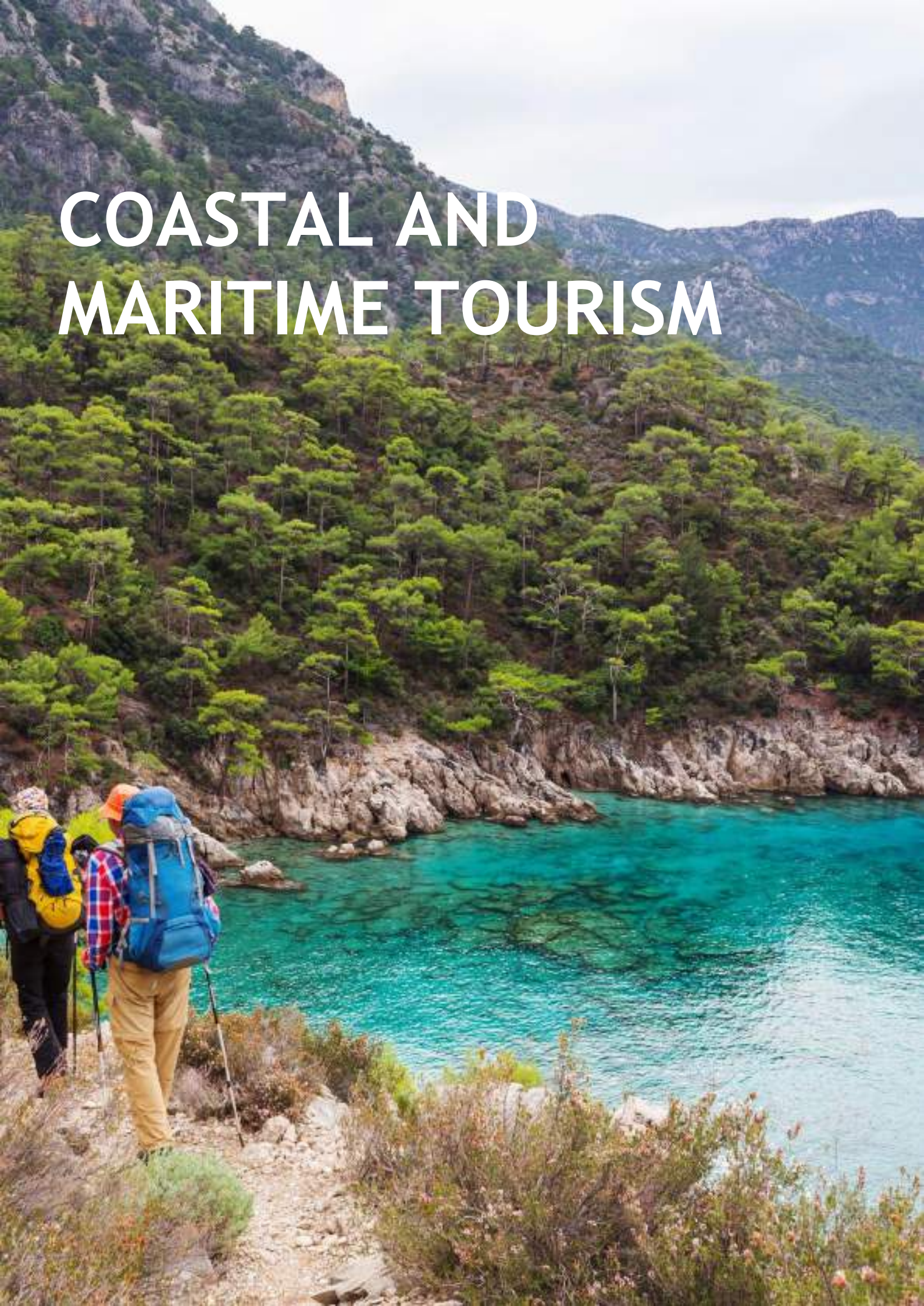
A MEDiterranean collaboration in expanding this center would transfer important knowledge from the EU to non-EU countries in the sea basin.[110]

Table 6 Examples of what jobs I can expect / Job range

On land / office work	Mainly offshore work at sea
• Charter operator • Forklift driver • Insurance representative • Fleet management • Sales and marketing • Crane operator • Economic analyst • Cargo or Passenger Transport management • Port or Marina management • Ship or Boat broker • Online services provider • Ships Architect - Designer	• Aquaculture technicians (management, maintenance) • Fisheries managers • Engineers for offshore systems) design, installation, maintenance) • Skippers • Fishers

109 Sea of Experience (2020) Future skills and new education trends in the Maritime sector
110 SkillSea (2023) Press release - Substantial need for Up and ReSkilling Maritime Professionals

COASTAL AND MARITIME TOURISM



INTRODUCTION

The 2021 UfM Ministerial Declaration on SBE[111] underlined that coastal and maritime tourism is one of the most important economic sectors for Mediterranean countries with their attractive and reachable coasts and coastal cities, but also that this sector has significant impacts on the environment and local populations.

Ministers underlined that preserved marine and coastal ecosystems and maritime cultural heritage contribute to the attractiveness of coastal areas.

UfM member countries recognise that relevant policies addressing seasonality, promoting offer diversification, integrating the local dimension, encouraging slow, niche and eco-tourism, but also, including research and innovation, have to consider the impact of tourism activities on coastal areas and the vulnerability and complexity of coastal and maritime ecosystems. Investments and fiscal policies are evoked as key intervention tools in the Declaration.[112]

Recently in Athens,[113] Mediterranean stakeholders acknowledged that the sector had been hit hard by the COVID-19 pandemic. However, the sector has recovered rapidly and the rebound effect, at least in the northern Mediterranean countries, is – among other impacts - putting increasing pressure on coastal and marine ecosystems.

At the same time, the sector is highly vulnerable to climate change. With rising sea levels, increasing temperatures and seasonal water shortages, the implementation of adaptation strategies will be of paramount importance in the future.

To reduce pressure on ecosystems, it will be important to consider ecosystems, biodiversity and nature as important assets to promote more sustainable tourism, and to embrace sustainability to create positive impacts generated by the tourism industry.

Mediterranean countries must continue to learn from each other and define a common vision and clear criteria for sustainable blue tourism.

The gaps, challenges and opportunities for regional cooperation in this sector were discussed and highlighted at the recent UfM webinar on “Scaling up synergies and partnerships for the sustainable maritime and coastal tourism transformation in the Mediterranean.”[114]

The importance of data and the need for continuous data monitoring and analysis has also become apparent. Based on this awareness, UNWTO has supported the establishment of a Coastal and Maritime Tourism Monitoring Centre based in Greece. Multilevel governance models between communities and destinations, regional and national levels will be needed to create integrated and systemic approaches that consider not only economic opportunities, but also broader sustainability dimensions, such as waste management, biodiversity protection or adaptation to climate change. At the same time, Evidence-based information for monitoring, evaluation and planning is needed to measure the overall impact of tourism on marine ecosystems and the economy. To take this forward, Plan Bleu is working with other stakeholders to develop common indicators at the Mediterranean level.

111 Union for the Mediterranean (2021) Ministerial Declaration on the Sustainable Blue Economy
112 Ibid, page 11
113 Union for the Mediterranean (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy: Outcomes and Main Messages
114 Union for the Mediterranean (2024) News: UfM Webinar (June 20) - “Scaling up synergies & partnerships for the sustainable maritime & coastal tourism transformation in the Mediterranean”. More information available at: https://medblueconomyplatform.org/vkc/news/ufm-webinar-june-20-scaling-up-synergies-partnerships-for-the-sustainable-maritime-coastal-tourism-transformation-in-the-mediterranean-30fba3fc1d/

OVERVIEW

Coastal and maritime tourism is one of the main economic sectors for Mediterranean countries,[115] accounting for 13% of Mediterranean countries' exports and 23% of the service sector.[116]

With its accessible and attractive coastlines and coastal cities, the Mediterranean is a leading global tourism region, representing 35% of global tourist arrivals and 30% of global receipts, while hosting about 20% of the world's hotel accommodation capacity across about 10.000 destinations, 600 ports, 100.000 hotels and one million restaurants.[117]

Coastal and maritime tourism plays therefore a crucial role in the economic development and job creation across the Mediterranean region, with a steady recovery, particularly across EU Member States, since the latest crisis induced by the 2019 COVID pandemic.[118]

The sector is expected to become globally the largest value-added blue segment by 2030.[119]

Coastal tourism experienced a gradual recovery in 2023, which has continued into 2024, generating the largest share of employment and GVA in the EU Blue Economy at 54% and 29 respectively.[120]

The sector is also a key driver of employment for women and youth. More data, information and analysis can be found below in the dedicated section on employment in the coastal tourism sector.

However, the sector is also characterised by a number of structural fragilities, including the volatility caused by the negative impacts as a result of the effects of climate change on coastal areas (floods, coastal erosion) and due to persisting and aggravating global shocks (political tensions, financial crises, pandemics, etc.).

The sector is also still over-relying on business models that tend to externalise social and environmental pressures.[121]

Importantly, the sector is currently a great energy consumer and, in order to be fully sustainable, it should accelerate its transformation towards the reliance on fully green energy models, possibly locally generated.[122]

Furthermore, a resurgence in the important component of cruising, yachting, and marinas, which has been challenged during the COVID-19 pandemic crisis, is now calling for new approaches, in order to favour higher-local gains possibly through smaller-scale models, which could maximise local potentials while reducing and neutralising traditional environmental and social negative impacts of the larger-scale cruise industry.[123]

Such conditions require structural changes towards more ecologically sustainable, socially resilient, and 'embedded' business models, including through an assessment of the environmental footprints of its value chain and development of green and fully sustainable products and services, including green and nature-based tourism, as well as a greater focus on positive social impacts for local communities.[124]

A new approach for the sector would imply greater focus on quality and stable jobs, for example through innovative financing models that could favour local businesses and innovative start-ups, while maximising digital potentials, and exploiting in a sustainable manner the local traditions, culture and ecosystem assets.[125]

Tourism is a key sector for all Mediterranean countries. The region attracts about one third of world tourism.[126]

The tourism sector is labour intensive, contributing an average 11.5% of total employment in Mediterranean countries, according to the WTTC.[127]

115 Union for the Mediterranean (2021) Ministerial Declaration on the Sustainable Blue Economy
116 ASCAME (2022) The new normal for Mediterranean tourism. More information available at: https://www.ascame.org/new/the-new-normal-for-mediterranean-tourism/
117 UN Environmental Programme (2020) The blue economy in the Mediterranean. More information available at: https://www.unep.org/unepmap/resources/factsheets/blue-economy
118 Plan Bleu (2022) State of Play of Tourism in the Mediterranean: Roadmap for a greener, inclusive and resilient tourism in the Mediterranean
119 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends, Challenges and Policy Pathways
120 European Commission (2024) The EU Blue Economy Report 2024
121 Union for the Mediterranean (2022) Operational handbook: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model
122 EURACTIV (2022) Mediterranean region seeking to decarbonise its tourism industry. More information available at: https://www.euractiv.com/section/energy-environment/news/mediterranean-region-seeking-to-decarbonise-its-tourism-industry/
123 ICBSS (2023) Sustainable small-scale boating
124 IUCN (2023) Sustainable tourism
125 Union for the Mediterranean (2022) Operational handbook: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model
126 Plan Bleu (2022) State of Play of Tourism in the Mediterranean: Roadmap for a greener, inclusive and resilient tourism in the Mediterranean
127 Eco-Union (2021) The future of Mediterranean tourism in a (post) covid world: back to mass tourism or leapfrog toward sustainability?

The sector has recovered well in many countries in the region and in terms of international tourist arrivals, it is close to figures in 2019 before the COVID-19 pandemic.

According to the first UNWTO World Tourism Barometer of the year, international tourism ended 2023 at 88% of pre-pandemic levels, with an estimated 1.3 billion international arrivals. Southern Mediterranean Europe and North Africa exceeded their 2019 arrival levels.

The rebound in 2022 comes on the back of robust catch-up demand and the lifting or easing of travel restrictions in many countries. 2023 follow similar pattern to 2022.

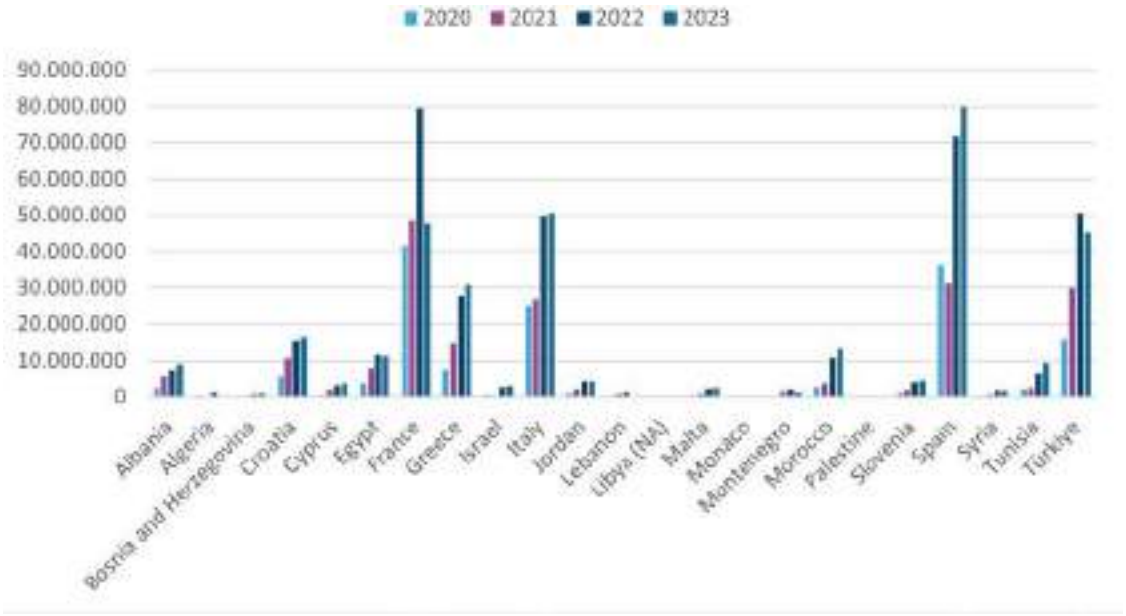
In many Mediterranean countries, there was a slight increase in tourist arrivals.

Repartition of Mediterranean tourism flows is characterised by a strong disequilibrium and inequality, both in terms of tourism flows and economic benefits. Most tourists in absolute terms arrive in Spain, Italy and France in the North of the Mediterranean.

Türkiye, Greece and Croatia follow in the East. Egypt and Morrocco welcome the most international tourists in the South. When comparing tourist arrivals to the population of the countries an interesting pattern shows that countries such as Cyprus, Malta, Croatia and Greece welcome more tourists than inhabitants while countries such as Egypt, Morocco and Italy receive less tourist than there are inhabitants.

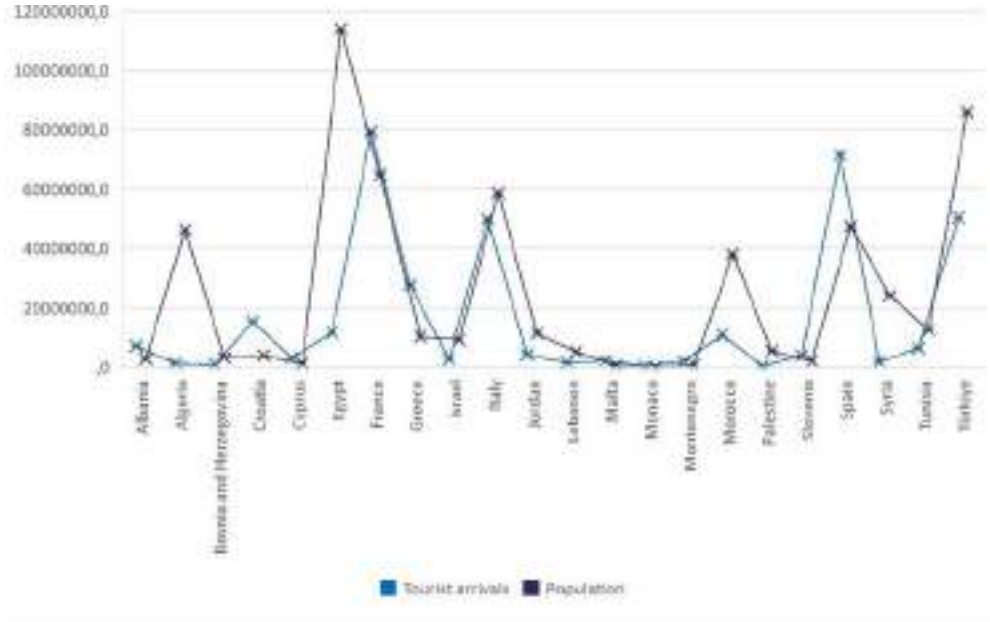
Figure 12 shows in particular the tourism pressure in countries with fewer inhabitants. Malta for instance received over 2 million tourists and its population is 500,000. Tourists outnumbered inhabitants by a factor of 4 this year.

Figure 11 International tourist arrivals by country in the region (2020-2023)



Source: elaboration based on data from UNWTO (2024)

Figure 12 International tourist arrivals in 2022 compared to population



Source: elaboration based on data from UNWTO and on United Nations data for population (2024)

These patterns also reflect the different levels of vulnerability across the region to (regional and global) shocks to the local tourism business ecosystems. Higher dependence on tourism leads to a more vulnerable economy.

The sea basin also hosts 21.8% of world cruise vessels with almost 24 million travellers in 2022. This is an increase of 76% in passenger movements compared to the previous year, and increasingly recovering from the COVID-19-induced crisis, hence still showing a decrease of 22.54% compared to the pre-COVID performance in 2019. The Mediterranean continued in 2022 as the second-largest cruise market in the world behind the Caribbean.[128] [129]

Cruise tourism poses serious environmental risks, as cruise ships represent less than 1% of the global maritime fleet and their emissions account for around 2.5-3% of global shipping emissions, which the sector must address. In the EU, the sector is investing in onboard and port technologies and cleaner fuel sources to reduce the environmental impact of new cruise ships.[130]

As regards to the ratio of tourism direct gross value added to total gross value added (GVA) in the economy, Croatia recorded the highest figure (11.3%), followed by Portugal (8.1 %), Spain (6.9 %) and Italy (6.2 %).

The average for the EU was estimated at 4.5 %. France's GVA is below the EU average at 4%.[131]

The majority of yachts in the Mediterranean are less than 24 meters in length, but large yachts are on the increase, in line with global trends.

Around 70% of the world's mega-yachts sail in the Mediterranean year-round, with marinas close to full occupancy of their capacity, especially in EU-Western Mediterranean countries and in high season.[132]

Eastern Mediterranean destinations are also growing in popularity and following the same trend.[133]

128 UNWTO (2024) International tourism to reach pre-pandemic levels in 2024. More information available at: https://www.unwto.org/news/international-tourism-to-reach-pre-pandemic-levels-in-2024

129 MedCruise (2022) MedCruise 2022 Statistics: Cruise Activities in MedCruise Ports. More information available at: https://www.medcruise.com/news/3d-flip-book/medcruise-statistic-report-2022

130 European Commission (2023) Good Practices for Sustainable Cruise Tourism Final Report

131 Eurostat (2023) Tourism Satellite Accounts in Europe Statistical Report

132 PlanBleu (2024) Cruising and recreational boating in the Mediterranean. More information available at: https://planbleu.org/en/page-theme/cruises-and-boating-in-the-mediterranean/#:~:text=Following%20global%20trends%20(annual%20passenger,of%2011.5%25%20compared%20to%202018

133 Moravia Yachting (2024) Mediterranean Yacht Charter Trends for 2024. More information available at: https://moraviayachting.mc/news/charter/mediterranean-yacht-charter-trends-for-2024

The main challenges for the future development of the cruising and recreational boating / yachting sectors are related to the avoidance of negative externalities, i.e. the important but to be reformulated environmental costs imposed by these economic activities in terms of pollution ecosystems degradation and biodiversity loss.

Importantly, in February 2022, the European Commission presented the Transition Pathway for Tourism.

The transition pathway is a plan, developed together with stakeholders in the tourism sector, that details key actions to achieve the green and digital transition and long-term resilience of the sector.

The Transition Pathway calls on the tourism industry to take action among others in investing in circularity to reduce energy, waste, water, and pollution while better meeting the growing demand for sustainable tourism; improving data-sharing practices to enable new innovative tourism services; improving the sustainable management of destinations; and in investing in skills to ensure the availability of skilled workers and attractive careers in the ecosystem.[134]

It is too early to assess the effects of such important regulation, but these are aspects to be duly considered when discussing the way forward for the sector in the upcoming future.

In light with the objectives of the Transition Pathway for Tourism, the WestMED Initiative has recently launched a Technical Group on sustainable tourism aiming at serving as support forum where participants can discuss about their needs to advance towards a sustainable tourism within the Western Mediterranean around the topics already set at EU level with regards to the tourism-related topics of green transition, digitalization, governance, and skills.[135]

134 European Commission (2022) Press release – First transition pathway co-created with industry and civil society for a resilient, green and digital tourism ecosystem. More information available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_850

135 More information available at: https://medblueconomyplatform.org/wp-content/uploads/2024/07/PPT_27J_WestMED-update-ecorys.pdf

FUTURE (2025-2030)

The main challenge ahead for the sector in the Mediterranean, as discussed in the introduction of this section, is to fully support a transition towards sustainable (socially, economically and environmentally) and innovative practices, to fulfil the sector's potentials towards achieving the SDGs in the region.[136]

It should in fact be noted that, while a good range of good practices are available for the adoption of such business models by large and smaller businesses - and a growing interest and appeal in investing in such sustainable models is demonstrated by impact investors local actors (destinations, businesses, policymakers) are not sufficiently involved in the decision-making and implementation of the transformation of the sector. And often find it hard to effectively engage with those impact investors interested in sustainable tourism.[137]

Synergies with other sectors

Future innovative approaches should also be coupled with greater integration and synergies between local tourism offers and other related sectors (agriculture, fisheries, restauration, transport, infrastructures for energy efficiency, etc.).

Such cross-sectoral synergies will in fact allow to create more complex touristic offers and value chains and maximise the local capturing of the added value generated by local tourism offers.[138] Box 2 below outlines examples of synergies with other sectors.

Box 2 Examples of synergies with other sectors

Examples can be found in the interlinkage of tourism and aquaculture. In Spain, there is an offer to snorkel in tuna farms, creating a novel touristic offer in a tourism village.[139] Tourism and marine renewable energies can also be combined. An example can be found in France, where boat tours in the wind farms are offered.[140] Pesca-tourism is another example, where tourists go fishing with professional fishers. This is being done for instance in the Spanish region of Murcia.[141] Tourism and citizen science can also be linked. For example, tourists who help to clean beaches can collect data on waste which can help research to learn more about the nature and amount of litter on beaches.

Digitalisation of the sector

Also, a need will persist in the future towards a greater uptake of the potentials offered by digitalisation.

Tailored data and real-time market intelligence, in fact, is essential to an effective monitoring and assessment of tourism performances.

Importantly, on-line data is also key to promote sustainable offers towards a globally evolving demand of 'climate friendly' and 'sustainable travel' visitors, particularly but not exclusively amongst the younger generations – and in niches of "slow tourism" and nature-based destinations.

For example, an even greater uptake of the 'Internet of Things', location-based services, artificial intelligence, augmented and virtual reality, and blockchain technology will have the potential to further reshape a regional tourism offer that is more attractive, efficient and (potentially) inclusive and sustainable, smarter destinations.[142]

Yachting and marinas

An expected growing trend in the development of yachting and marinas across the region[143] offers additional opportunities for generating added value in the future, but with persisting risks due to the possible concentrations of valuable economic assets in specific destinations, being managed by a limited number of large players.

In the absence of proper planning, for example, large marinas might risk creating new hotspots for ecosystem pressure and coastal hazards, which could be avoided through the rising trend of green marinas and the maximisation of existing harbours rather than the construction of new intrusive infrastructures.

Yachting might also require new business models in the future, to address the current trend of poor usage of the regional yachts, remaining parked and underutilised for the most part of the year.

136 ASCAME (2022) The new normal for Mediterranean tourism. More information available at: https://www.ascame.org/new/the-new-normal-for-mediterranean-tourism/
137 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends, Challenges and Policy Pathways
138 Union for the Mediterranean (2022) Operational handbook: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model
139 More information available at: https://tuna-tour.com/en/
140 More information available at: https://maritime-spatial-planning.ec.europa.eu/case-studies/boat-tours-saint-brieuc-offshore-wind-farm
141 More information available at: https://www.turismomarineromurcia.com/turismomarinero/
142 Union for the Mediterranean (2022) Operational handbook: Shared methods and tools for relaunching a sustainable post COVID-19 tourism model
143 SuperYachts (2023) Mediterranean Migration Analysis. More information available at: https://www.superyachtnews.com/business/mediterranean-migration-analysis-

To foster more sustainable and profitable models, boating charters and rental services may rise in the future, as opposed to ownership of boats, while small-scale boating may offer more flexible and value-added services than traditional (large-scale) cruises.[144]

Still, a proper assessment of the risks of current boating models, and the emerging potentials of alternative niches, require a proper assessment through standardised and comprehensive datasets (yacht movements, marinas performances) which are still relatively limited across the Mediterranean.[145]

Impact of climate change on the sector

The Mediterranean is expected to become less attractive for tourism as extreme temperatures increase.[146]

The Mediterranean region faces significant risks from climate change. Key regional risks identified include increased water scarcity (especially in the south and east) and drought (in the north), coastal risks due to flooding, erosion and saltwater intrusion, forest fires, loss of terrestrial and marine ecosystems, and risks to food production and security, human health and well-being, and cultural heritage.[147]

Persisting climate change will further accelerate the risks of floods and rising water levels, hence requiring strong infrastructural adaptation and mitigation investments for coastal tourism in the region, as well as new policy and sectoral approach to support a climate-neutral transition for the sector.[148]

Suffering from a heightened vulnerability to climate change and its repercussions on socio-economic and political stability, the Mediterranean basin is projected to experience a significant decrease in freshwater supply and water stress over the next decades as freshwater resources are vulnerable to sea level rise and associated salinisation.[149] The region's water demand is expected to double or even triple by 2050.[150]

The Mediterranean region faces significant risks from climate change. Climate change is closely linked to other environmental problems in the Mediterranean Basin, resulting from urbanisation, land-use change, biodiversity loss, habitat loss and degradation of terrestrial and marine ecosystems.

The Mediterranean basin contains a wide variety of climatic conditions within short distances, which are likely to shift northwards with global warming.

As a result, ecoregions will be exposed to potentially unsuitable conditions a more arid climate, meaning potential desertification will affect additional areas, particularly in the South and South-East.[151]

There is no sustainable maritime and coastal tourism without healthy and restored ecosystems.

The natural capital of the region is important for recreational and cultural ecosystem services. While tourism is affected by the impacts of climate change, it is also contributing to climate change.

Globally, tourism is responsible for roughly 8% of the world's carbon emissions.[152]

While flying is the largest source of these emissions, other activities, such as boat rides, air conditioning in hotels to souvenirs and lodging, various activities contribute to tourism's carbon footprint.[153]

Demand for sustainable travel

And yet, consumer surveys show that sustainable travel is vital to travellers and that many travellers want to travel more sustainably in the future as a reaction to the pandemic.[154]

To remain the top destination that it is today, tourism business models in the Mediterranean need to reflect on how to avoid this potential shift in demand and assure a resilient and sustainable future for the sector.

In particular, a reflection on how to remain attractive for young travellers is essential for the future, as youth and young professionals are driving the demand of sustainable models of tourism with positive local impacts.[155]

The tourism sector needs to diversify its offer. Apart from the traditional tourism model , it can offer, among others, maritime archaeology, surfing, cruises, eco-tourism, and recreational fishing operations.

Examples of ecotourism include pesca-tourism, culinary tourism, sports and adventure tourism, accessible tourism, nature and culture trails, and underwater reality experiences, among others.[156]

144 ICBSS (2023) Sustainable small-scale boating
145 Lazarus, Eli D. & Ziros, Lonidas A (2021) Yachts and marinas as hotspots of coastal risk
146 Ali, E. et al,. (2022) Cross-Chapter Paper 4: Mediterranean Region. In: Climate Change 2022: Impacts, Adaptation and Vulnerability
147 Ibid
148 Union for the Mediterranean (2018) Climate change impacts in the tourism sector
149 Ibid
150 UNEP (2024): Climate change in the Mediterranean. More information available at: https://www.unep.org/unepmap/resources/factsheets/climate-change
151 Ibid
152 More information available at: https://www.nature.com/articles/s41558-018-0141-x?_ga=2.18565241.1703394967.1690170341-2133030499.1689826219
153 Ibid
154 Goodwin, Harold (2022) WTM Global Hub: There is growing demand for sustainable travel - don´t miss out. More information available at: https://hub.wtm.com/blog/responsible-tourism/wrtd-spotlight/there-is-growing-demand-for-sustainable-travel-dont-miss-out/
155 Pfalz, Lacey (2024) TravelPulse: Young travelers are increasingly interested in sustainable travel. More information available at: https://www.travelpulse.com/news/features/young-travelers-are-increasingly-interested-in-sustainable-travel
156 Murcia, Celia (2023) Blue Economy as an Opportunity for Enhancing Youth and Womens Employment in the Mediterranean

Eco-tourism is a sustainable alternative to the traditional tourism model, where the main motivation for tourists is the observation and appreciation of nature and traditional cultures in natural areas. Maritime or ocean-related tourism, as well as coastal tourism, are vital sectors of the economy in many countries.

Innovation in the sector

The overall growth capacity of the sector through more sustainable and value-adding models is expected to remain high in the near future but requires appropriate skills and competences to be able to implement the foreseen changes.

Also, a number of innovative approaches may allow for more sustainable paths across the region in the future: networking across sustainable operator towards a single sustainable tourism destination brand, fostering of innovation towards fully sustainable, safe and accessible destinations, greater ability to plan and develop green tourism infrastructures, diversification of products and services across a widening range of different tourist and markets.[157]

Circularity in tourism

The recreational use of Mediterranean island beaches during the summer is responsible for up to 80% of the marine litter accumulating on those beaches and generates huge amounts of microplastics through the fragmentation of larger plastic items.[158]

About 85% of floating marine litter and 45-95% of surface marine litter consists of plastics, mainly generated by the tourism industry. Despite the existence of international strategies such as the 'Regional Plan for Marine Litter in the Mediterranean', which supports countries such as Morocco, Tunisia and Egypt in combating marine plastic pollution through innovative measures, waste generation continues to increase.

For example, tourists in Tunisia produce up to three times more solid waste per capita per day (2.6 kg) than locals (0.6-1.0 kg). While tourists are unlikely to be aware of the significant impact they are having on the environment, the sector suffers from lost revenue due to beach clean-up or waste disposal costs and a poor reputation.[159]

A circular and green approach to the sector,[160] including for recycling of waste as well as for infrastructure and boating construction and repair, will have to be further scaled up to achieved effective impacts across the Mediterranean.[161]

To become more circular the tourism sector faces various challenges.[162]

Implementing circular practices requires optimising the use of resources, minimising waste, and promoting recycling. In tourism, this means managing resources such as water, energy and materials more efficiently. Designing products (such as accommodation, transport and amenities) for longevity and ease of repair is crucial.

However, achieving this shift in the tourism industry can be challenging due to existing business models and consumer expectations. Circular initiatives require collaboration between different stakeholders, including businesses, governments and local communities.

Aligning interests and fostering collaboration can be complex in the dynamic tourism ecosystem. Encouraging tourists to adopt circular practices (such as reusing towels, reducing single-use plastics or choosing sustainable accommodation) requires raising awareness and changing behaviour.

Overcoming resistance and fostering a sense of responsibility are ongoing challenges. The development of circular infrastructure (e.g. waste management systems, renewable energy sources and efficient transport) is essential.

However, retrofitting existing infrastructure and introducing new technologies can be resource intensive. Policymakers have a crucial role to play in promoting circular practices.

Creating supportive regulations, incentives and sanctions can drive industry-wide adoption. Balancing economic growth and environmental protection remains a delicate task. The transition to a circular economy is fraught with risks, including financial uncertainties and potential disruptions.

Businesses need to manage these uncertainties while embracing circular principles. The tourism sector faces unique challenges such as seasonality, cultural diversity and different local contexts.

Adapting circular strategies to these nuances requires creativity and flexibility. Balancing economic growth and environmental sustainability is perhaps the most critical challenge. Circular practices should promote both without compromising either.

157 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends, Challenges and Policy Pathways

158 Grelaud M. and Ziveri P. (2020) The generation of marine litter in Mediterranean island beaches as an effect of tourism and its mitigation. *Scientific Reports*, 10, 20326.

159 More information at: https://toumali.org/en/tourism-and-marine-litter#:~:text=Tourism%20Marine%20Litter&text=About%2085%20%25%20of%20floating%20marine,generated%20within%20the%20tourism%20industry

160 EcoUnion (2021) Towards a sustainable blue tourism in the Mediterranean

161 CPMR InterMediterranean Commission and MedWaves, the UNEP/MAP Regional Activity Centre for SCP (2022) A Circular Blue Economy for the Mediterranean: Current practices and opportunities

162 Interreg Euro-MED (2024) Climate Change Adaptation Nature and Biodiversity - Orientation Paper

Impact of technologies

Technological developments are also expected to continue propelling new models for the tourism industry. A whole area of increasing opportunity is that of automated drones and underwater devices, which would allow for touristic and underwater experience a wider range of potential tourists including remote visiting, access for disabled and elderly.

These technologies would allow for a wide range of innovation including opportunities for yachting, marinas and online service providers further broadening up the current demand for under-water and deep-sea tourism.[163]

The digitalisation of the tourism sector should be linked with positive environmental impacts through innovations in manufacturing and efficient use of resources contributing to a more sustainable industry footprint.[164]

The table below (table 7) presents challenges and opportunities related to coastal and maritime tourism that the sector will face in the Mediterranean.

Table 7 Tourism Challenges and Opportunities

Challenges	Opportunities
Challenges are posed by emission-dependent cruise tourism which leaves local destinations with limited socio-economic gains and possible environmental hazards. There is a risk of a growing mega-yacht market with growing needs for large marinas and high ecosystem impacts.	Potential for small-scale cruising/boating models and sharing/renting of yachts/ chartering rather than buying, which would offer larger returns locally and lower negative externalities.
The persisting unsustainable impacts of current business models on natural ecosystems (leading to loss of habitats/biodiversity, exploitation of resources, maritime litter, CO2 emissions, etc.).	Sustainable tourism business models and practices (e.g. involving more resilient and adaptive infrastructures, circular services/ products, skills, and capabilities, etc.).
Coastal communities across the Mediterranean are expected to be severely affected by climate change.	Integration and synergies with other sectors in order to maximise the added value of local tourism (e.g. pesca-tourism, eco-tourism, promotion of intangible heritage).
Mass tourism effects and the social and environmental impacts due to the seasonality of the summer period.	Domestic tourism is providing a boost to many destinations and businesses and will continue to be a key driver of recovery.

163 BBC (2023) How underwater and deep-sea tourism became so popular. More information available at: https://www.bbc.com/travel/article/20230620-how-underwater-and-deep-sea-tourism-became-so-popular

164 Plan Bleu (2022) State of Play of Tourism in the Mediterranean: Roadmap for a greener, inclusive and resilient tourism in the Mediterranean

The table below (table 8) illustrates recent and ongoing projects addressing challenges discussed in this chapter that coastal and maritime tourism is facing in the region connecting Mediterranean stakeholders and/or providing innovative solutions. An emphasis has been put on projects with the participation of stakeholders from various UfM member countries.

Table 8 Projects and Initiatives related to Coastal and Maritime Tourism

Project	Description	Funding Source	Period
Multiprogramme Coordination Mechanism	Since 2021, the Interreg Euro MED, Maritime Italy France and NEXT MED Programmes, have been working together to enhance sustainable tourism in the Mediterranean. This pilot action aims at transferring the most valuable results, creative tools , and governance papers to concretely support stakeholders in tourism sector. The initiative has developed a Sustainable tourism toolkit. It represents the first concrete result of the pilot action. It gathers some of the best transferable and most valuable results to concretely support stakeholders in solving issues they face across the Mediterranean in developing a sustainable tourism sector.	Interreg MED	2021 - 2027
TouMaLi	TouMaLi aims to develop and establish sustainable waste management solutions in the tourism sector in the countries of Morocco, Tunisia, and Egypt to protect marine ecosystems in the Middle East and North Africa region. One of the main project goals is to decrease tourism-related beach pollution in the project region. The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety is co-funding the project with a budget of EUR 4.2 million.	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)	2020 - 2025
REBOOT MED	REBOOT MED (Recovering, Experiencing and Boosting eco-tourism in the WestMed area) is a project that encourages public-private partnership, co-defining Blue Economy Action Plans for the Recovery of the tourism sector, and incubating, accelerating, and testing eco/blue economy tourism products and packages in Mauritania, Tunisia, Morocco, Spain, Italy and France. The project is funded by the European Maritime, Fisheries and Aquaculture Fund with a budget of EUR 1.2 million.	EMFAF	2022 - 2024
Community4Tourism	The project funded by the Interreg MED programme aims to improve governance of cooperation, both policy governance and multi-sectoral, multi-level, and transnational territorial governance, with a strong focus on the environment and climate, promoting a smarter and greener Mediterranean. The project includes participants from Spain, Greece, Croatia, France, Italy and Albania.	Interreg MED	2023 - 2029
D4T - Dialogue4Tourism	The overall objective of the D4T project, funded by the Interreg MED programme, is to increase the coordination level and institutional capacity of public authorities, multi-level bodies, programmes, strategies, and initiatives in the MED, aiming to transform tourism into greener, smarter, and more resilient, embracing the fourfold approach of the mission: circularity of tourism services, environmental neutrality, sustainable ecosystem services, and cultural and natural preservation of resources. The project includes participants from Spain, Montenegro, France, Greece, Italy, Croatia and Cyprus with the EUR 4 million.	Interreg MED	2023 - 2029

Project	Description	Funding Source	Period
WINTER MED	The WINTER MED partnership has succeeded in fulfilling one of its main commitments: the elaboration of a transnational strategy for all-year-round tourism in Mediterranean Island Destinations. The WINTER MED project, co-funded by the Interreg MED programme, is committed to the delivery of a Transnational Year-Round Tourism Strategy for Mediterranean Island Destinations 2021-2026. The WINTER MED strategy aims to lead sustainable tourism development collaboratively, fostering dialogue, ownership, growth, innovation, and action and to help protect Mediterranean island destinations for future generations. The project includes participants from Italy, Spain, France, Croatia, Cyprus, and Greece and has a budget of EUR 2.6 million.	Interreg MED	2019 - 2022
NaTour4CChange	As a thematic project of the Sustainable Tourism Mission of the Interreg MED Programme, NaTour4CChange will set common methods to allow participating regions to assess their tourism-related climate adaptation and mitigation priorities, and take climate action via plans and strategies, supported by cooperative governance. It will also build on successful experiences at the Mediterranean and global level to test nature-based solutions for increasing the resilience of the pre-selected coastal destinations in the Mediterranean. The project includes participants from France, Croatia, Greece, Bosnia-Herzegovina and Spain with a budget of EUR 3 million.	Interreg MED	2024 - 2026
MedArtSal	The MedArtSal project, co-funded by the ENI CBC Mediterranean Sea Basin Programme, will lead to the economic, social and environmental revival of the concerned salinas in Italy, Lebanon, Spain and Tunisia. Form the economic point of view, new businesses, products and related services (e.g. tourism, logistics) based on the valorisation of salt products will be created. Salinas will also experience more sustainable management through better use of natural resources. The project has a budget of EUR 3.2 million.	ENI CBC MED	2019 - 2022
BlueRoses	The project, co-funded by the European Maritime and Fisheries Fund, aims at testing and further expanding the potential usage of Blue Robotics for Sustainable Eco-friendly Services for innovative marinas & leisure boats. The project combines the need for social, environmental and economic sustainability with the design of innovative services and products such as: a) remote access to underwater sites for tourists; b) design of leisure boats integrating underwater robotics; c) robotic access and monitoring of marinas' waters and seabed. The project has a budget of 3.2 million and includes participants from Italy, Portugal, Spain and Greece.	EMFF	2019 - 2022

EMPLOYMENT

Tourism is an important source for growth and jobs, especially for youth, as 13% of the tourism-related work force are aged under 25. The sector employs almost twice as many young people as other economic sectors.[165]

Furthermore, 58% of those employed in core tourism activities are women, reaching the highest percentage within the blue economy sectors.[166-167]

Tourism is also the largest employer of migrant and part-time workers. Women working in the sector are often paid less than their male colleagues. In Spain, for instance, data from 2019 shows that the gender wage gap was above 20%.[168]

The term social responsibility is included in numerous international documents in the tourism industry, which should imply equal rights for all employees in the tourism industry. By adopting ethical codes in the tourism industry, the UNWTO emphasised the importance and equality of employment of women in tourism.

Although women secured the right to vote and employment almost a hundred years ago, they have yet to achieve equal pay. Women's equality in the tourism industry is still mainly declarative and continues to be a goal to be achieved.[169]

Jobs in coastal tourism do not appear high on the list of most popular jobs, mainly due to negative perceptions of job quality, seasonality, and limited career prospects. In addition, women continue to face barriers to recruitment, the 'glass ceiling' preventing them from progressing to senior positions, and difficulties in reconciling work and family life.[170]

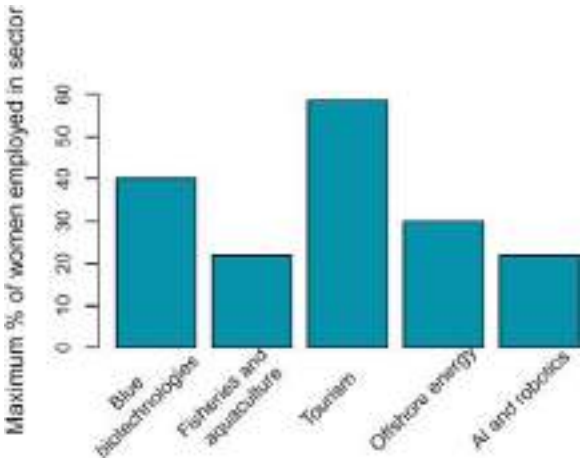
In order to take advantage of opportunities to promote women's employment and empowerment in the coastal tourism sector, gender-responsive policies are needed to remove barriers and promote equal access to employment and leadership positions.

Efforts should be made to improve capacity-building programmes, networking opportunities, and access to finance for women entrepreneurs (e.g. loans and micro-credit).

In addition, awareness campaigns and outreach programmes can help challenge gender stereotypes and encourage more women to pursue careers in coastal tourism.

These actions can be organised at regional level, but also at national and local level, where the impact of raising awareness tends to be greater.[171]

Figure 13 Percentage of women employed in the blue economy sectors



Source: WINBLUE (2024)

Several EU-funded initiatives focus on improving the skills demanded by the tourism industry. ScienceDIVER aims at building solid -long lasting- standardized training and clear career pathways for the diving scientists.[172]

To meet the lack of professional training in the nautical sector, Environaut is developing the first curriculum for the position of "Environmental Officer in Nautical Tourism."[173]

While the Nautilus project aims at developing an education and certification framework in water sports tourism.[174]

165 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism : Trends, Challenges and Policy Pathways
166 European Commission (2017) Blueprint for sectoral cooperation on skills. Responding to skills mismatched at sectoral level
167 WINBLUE (2022). Summary of the quantitative analysis on gender status in blue economy sectors
168 MEET Network (2021) Ecotourism in Mediterranean Destinations: From Monitoring and Planning to Promotion and Policy Support
169 Croatian Institute for Tourism (2024) "Women in tourism" Scientific Conference. Lessons learned or lessons forgotten?
170 Murcia, C. (2023) Policy Report: Blue Economy as an Opportunity for Enhancing Youth and Women's Employment in the Mediterranean
171 Ibid
172 More information about ScienceDIVER project: https://sciencediver.eu/
173 More information about Environaut project: https://environaut.eu/
174 More information about Nautilus project: https://nautiluscert.gr/

In terms of entrepreneurship, the Coastal Pro project develops training courses to develop a framework for next-generation skills in coastal tourism.[175]

In analysis of six Mediterranean countries (Albania, Croatia, France, Greece, Italy, Spain) using sectoral data on employment from 2019 showed that at the country level, the percentage of working men is significantly higher than that of working women in those six cases.

As for the tourism sector, the pattern is no longer the same for all countries. In the case of Albania and Greece, more men than women worked in the tourism sector, but for the rest of the countries it was the other way around, more women than men working in the sector.

The study also analyses data on female ownership of firms and women in managerial positions. It finds a great gender gap when it comes to representing important positions within companies and even when it comes to owning a company can be easily observed.

All countries show values significantly below 35% for women for both categories, except for Greece, where 46% of companies' ownership belonged to women.[176]

Global ocean cruising is a fast-growing industry and the biggest sector in tourism in terms of gross added value and employment.[177] The cruise industry is struggling to recruit women across the entire workforce, translating to only 3% of executive spots being held by women.[178]

As part of the 2021 EU Sustainable Blue Economy Communication, the sustainable development of coastal tourism needs to be strengthened. Climate-friendly, sustainable travel experiences have been on the rise in travellers' expectations in recent years, and the COVID-19 pandemic has further stimulated demand for 'slow tourism' and outdoor, nature-based destinations.

Sustainable tourism choices are expected to become more popular, with regional and local tourist destinations driving the recovery.[179]

Businesses in the industry, in particular SMEs, struggle to find and retain skilled employees. The COVID-19 pandemic had huge economic and social impacts on the sector, especially on small and medium-sized enterprises (SMEs) which account for 80% of the business ecosystem, and on women who represent 54% of the total tourism workforce.[180]

Tourism in the Mediterranean remains in fact a highly fragmented industry,[181] involving a limited number of large multinationals that tends to gather a large portion of the overall added-value, and a myriad of small and micro (often family-led) local enterprises.

The latter often struggle to capitalise on their potentials, as they lack any access to finance for innovation, as well as a basic understanding of emerging market and technology opportunities, while have too limited internal skills and competences to be able to capitalize on those.

In this context, Public Authorities particularly in southern Mediterranean countries may struggle to fully support those micro-SMEs in vulnerable situations (e.g. islands and areas with scarce resources) and even trying to effectively monitor the socio-economic practices of large companies. This is an area that require greater support, notably to reinforce institutional and business capacities and their role in strengthening the overall sustainability of the sector at the local levels.

Seasonality and seasonal employment are the main limitations of tourism employment.[182] Support is also needed to improve the general working conditions in the sector, notably through a wider diversification of tourism products and strategies from seasonal to year long.

This change is in fact instrumental in ensuring quality and long-term working conditions but would also require additional support to avoid labour shortages and support innovation capacities for local destinations and entrepreneurs. Ensuring gender balance and a fair distribution of income in tourism-related businesses is important to achieve financial and social sustainability in Mediterranean tourism.[183]

Work in the hotel sector is low quality, precarious and underpaid: long hours, insecure work, low pay, poor training and skills. There is a tendency to employ non-local workers, especially in large hotel chains.

In developing countries, low-level jobs such as maids, gardeners and other manual labour are performed by the local population, while high-level managerial positions are usually filled by people from the countries of origin of the accommodation, usually Western countries.

175 More information about Coastal Pro project: https://coastalpro.eu/
176 MEET Network (2024) The Socio-Economic Impact of Tourism in the Mediterranean
177 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends, Challenges and Policy Pathways
178 Mediterranean Observer (2023) Cruise Industry is struggling to recruit women across the entire workforce - Aptamind Partners Report.
179 European Commission (2021) Communication from the Commission to the European Parliament, Council, European Economic and Social Committee and Committee for the Regions on a new approach for a sustainable blue economy in the EU: Transforming the EU's Blue Economy for a Sustainable Future
180 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends. Challenges and Policy Pathways
181 PlanBleu (2022) State of Play of tourism in the Mediterranean: Roadmap for a greener, inclusive and more resilient tourism in the Mediterranean
182 Blue Tourism Initiative (2023) Towards Sustainable Blue Tourism: Trends. Challenges and Policy Pathways
183 PlanBleu (2022) State of Play of tourism in the Mediterranean: Roadmap for a greener, inclusive and more resilient tourism in the Mediterranean

Child labour in the hospitality industry is very common, especially in developing countries. Many boys and girls under the age of 12 are involved in activities related to hotels and restaurants, entertainment or souvenir sales, as porters or street vendors.

They are often exposed to harsh working and employment conditions. It is estimated that 13-19 million children and young people under the age of 18 (10-15% of those employed in tourism) work in the tourism sector worldwide.[184]

The region holds promising employment prospects for youth, particularly jobs related to the fields of technology, innovation and digitalisation, as young professionals are keener to work in the technological, sustainable and renewable sectors.[185]

Also new niches in sustainable tour operators are emerging, hence offering job opportunities for young entrepreneur/professionals, but also as an infrastructure which is able to promote more globally the social, cultural and environmental specificities of local destinations across the region. And possibly able to federate and networking across Mediterranean countries, so to move towards a joint brand for a sustainable Mediterranean tourism offering.[186]

In order to move towards a more sustainable tourism sector, new hard skills are needed for newly developed professions (e.g. climate change adaptation management, carbon neutrality efforts, circular economy skills, new business models in tourism, e-marketing, e-commerce and business management skills) and tourism professionals are expected to provide innovative, customised and value-added services to a wider range of target groups, including seniors or travellers with special needs (disabilities, etc.).[187]

Table 9 Skills needed for the Coastal and Maritime Tourism industry

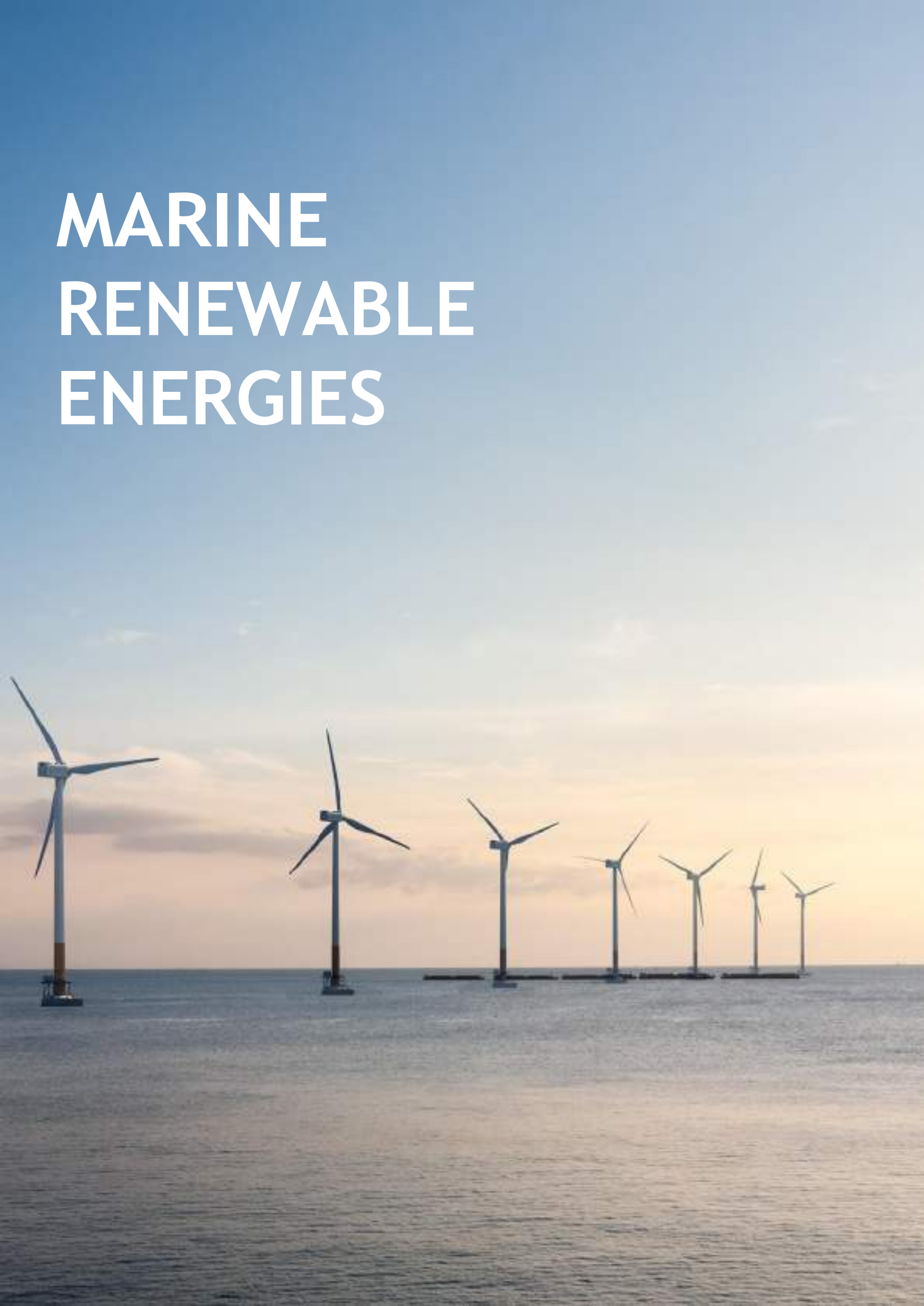
Hard skills	Soft skills
• Language skills • Digital skills (ICT skills, especially for smart tourism) • Entrepreneurial skills (designing innovative business models for sustainable tourism) • Marketing • Customer service • Sustainability • Physical skills • Health and safety skills • Culinary skills	• Self-direction • Problem-solving • Good communication competences • Willingness to learn • Resilience • Self-investment mentality • Collaboration competencies • Team management • Leadership and responsibility • Productivity and accountability

Table 10 Examples: what jobs can I expect?

On land / office work	Mainly offshore work at sea
• Beach Life guard • Coast Guard Services • Chef or Restaurant Staff • Walking Holiday Guide • Environmental Officer • ITC services i.e. Website designer • Cycling Team Tour Guide Leader or Operator • Tourist Information Advisor • Apartment and Villa rental agent • Property Management • Excursion Operations	• Water Sports Instructor • Boat - Maintenance, repair, cleaning services • Power boat skipper or instructor • Charter Vessel Operations

184 Tonazzini, D., Fosse, J., Morales, E., González, A., Klarwein, S., Moukaddem, K., Louveau, O. (2019) Blue Tourism. Towards a sustainable coastal and maritime tourism in world marine regions
185 PlanBleu (2022) State of Play of tourism in the Mediterranean: Roadmap for a greener, inclusive and more resilient tourism in the Mediterranean
186 MedArtSal (2023) Enhancing Sustainability and Tourism Through Branding of Artisanal Salt Salinas
187 Murcia, Celia (2023) Blue Economy as an Opportunity for Enhancing Youth and Women's Employment in the Mediterranean

MARINE RENEWABLE ENERGIES



INTRODUCTION

As stated in the 2021 UfM Ministerial Declaration on Sustainable Blue Economy,[188] Marine Renewable Energies (MRE) have a great potential to decarbonise the Mediterranean's energy infrastructure, combating climate change and enhancing the sustainable development of the economies of coastal areas and, in particular, islands.

The potential of MRE is crucial to contributing to global and European efforts towards decarbonization, in the framework of the UN Sustainable Development Goals (i.e. SDG7 Affordable and Clean Energy and SDG13 Climate Action) as well as the European Green Deal. Despite this and improvements in renewable energy production, the Mediterranean countries continue to rely on energy imports and fossil fuels.[189]

Recently, during the 2nd UfM Stakeholder Conference on Sustainable Blue Economy in Athens (February 2024), stakeholders highlighted three key elements to be taken into consideration on MRE projects: Maritime Spatial Planning (MSP) and full engagement with local coastal communities; early identification of environmental impacts and mitigation measures; and co-development and management of offshore wind with other sea related activities as a driver and facilitator.

Although this sector is still at a relatively embryonic stage in the Mediterranean, common needs have been identified in the region to facilitate the first stages of the development of concrete (commercial) projects, including the need for common/shared standards/regulatory frameworks.

In addition, the right set of skills in the existing workforce needs to be developed and guaranteed, investors should be placed at the centre of the discussion, and strengthening regional cooperation on MRE is of paramount importance.[190]

MSP is an indispensable tool to protect the environment by reducing impacts on ecosystems, reduce conflicts between activities while creating synergies among sectors, increase cross-border cooperation between countries, and encourage investment in the MRE sector.[191]

The importance of MSP was re-emphasised during the UfM Webinar on Fostering Sustainable Development of Marine Renewable Energy through Effective Licensing and Maritime Spatial Planning held on July 1st, 2024.[192] The critical aspects of licensing processes and MSP in the context of MRE was explored, with a particular focus on the Southern Med, in which development of MRE has been slower.

'MRE' encompass the energy generated by offshore wind, waves, tidal power, thermal energy conversion and salinity gradient. Additionally, floating solar photovoltaic energy (FPV) has been recently included as an emerging type of MRE.

The state of the art of FPV power at sea is still at an R&D and demonstration phase, with a growing interest in the past 5 years and several projects. While FVP remains significantly more expensive than onshore PV, whose Levelized Cost of Electricity (LCOE) fell under 50 €/MWh, it is already competitive among other ocean renewable energy technologies. For example, the LCOE's of floating solar is estimated to be 120-150 €/MWh while the cost of wave energy could reach up to 480€/MWh and 750€/MWh for tidal energy.[193]

Mediterranean countries pursuing deployment of floating solar PV plants are mainly Spain, France, Greece, Italy, Morocco, Portugal, Türkiye and Tunisia.[194]

The Mediterranean Sea is characterized by high (off-shore) wind potential, especially high in the Southern and Eastern Mediterranean region.[195]

188 Union for the Mediterranean (2021) Union for the Mediterranean (UfM) Ministerial declaration on Sustainable Blue Economy
189 UNEP/MAP and Plan Bleu (2020) State of the Environment and Development in the Mediterranean: Key Messages
190 Union for the Mediterranean (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages
191 WWF Mediterranean Marine Initiative (2024) Enabling Sustainable Offshore Wind in the Mediterranean through Ecosystem-Based Maritime Spatial Planning
192 More information at: https://medblueconomyplatform.org/vkc/news/ufm-webinar-july-01-fostering-the-sustainable-development-of-marine-renewable-energy-mre-through-effective-licensing-and-maritime-spatial-planning-msp-08238ab935/
193 European Commission (2023) The EU Blue Economy Report. 2023
194 Haugwitz, F. (2020) Floating solar PV gains global momentum
195 Tagliapiertra S. (2015) Renewable Energy in the Mediterranean: Current Status and Future Prospects

However, its deep waters have so far limited the development of offshore wind energy (OWE) -presenting an opportunity for floating offshore wind. Its production could reach up to 12GW by 2030 and close to 40GW by 2050 for the Mediterranean EU countries.[196]

Wave energy presents a comparable potential to floating offshore wind. However, wave energy presents higher costs and the technology requires further development.

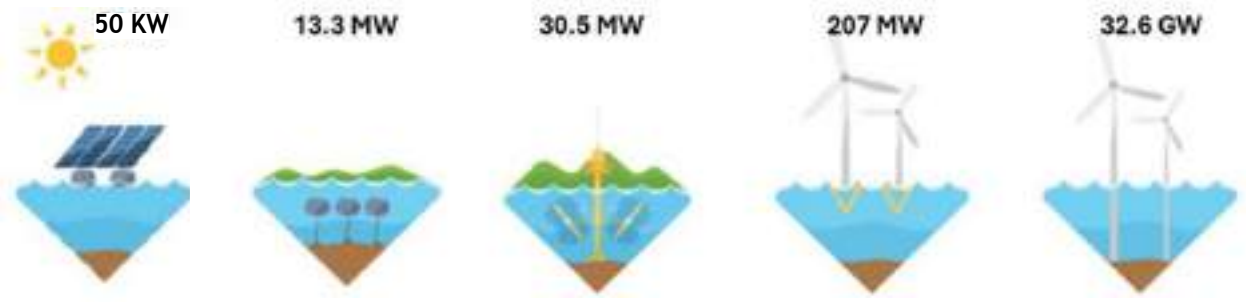
In comparison to wind and wave, tidal energy's technical potential in the Mediterranean is notably limited.[197]

Offshore wind energy is currently the only commercial deployment of a marine renewable energy source with wide-scale adoption. As of the end of 2022, European sea basins were hosting around 50% of the world's total installed capacity.

Nevertheless, offshore wind, and MRE in general, are facing challenges across several fronts, including increasing raw material prices, supply chain bottlenecks, technological issues, interference with other marine activities, uncertainties in the licencing process, lack of a regulatory framework and limited social acceptance. Its investment risk is still higher than the onshore wind or solar photovoltaics.[198]

New policies will be critical in navigating the current investment risks and ensuring that offshore wind rollout remains on track.[199]

Figure 14 Cumulative Renewable Energy Capacities in European Sea Basins (2023)



Source: European Comission Blue Economy Report 2023 (floating solar reference) and 2024 (wave, tidal, floating wind and bottom-fixed wind)

196 Interreg Med Blue Growth (2020) Blue Economy in the Mediterranean - Policy paper
197 K. Staschus et al., (2020) Study on the offshore grid potential in the Mediterranean region
198 Dukan et al. (2023) The role of policies in reducing the cost of capital for offshore wind iScience, 26
199 United Nations (2023) The Sustainable Development Goals Report. Special edition

OVERVIEW

The European offshore wind sector generated more than €2.15 billion in GVA in 2020, an 11% increase compared to 2019 and 46 times more than in 2009. Gross profits accounted for €1.3 billion and the reported turnover was about €14.9 billion.[200]

In the context of the current energy crisis, offshore wind energy has been confirmed as key to increase European security of supply and contribute at reaching the 2030 and 2050 climate neutrality targets.

The targets set at least 60GW of installed offshore wind and 1GW of installed ocean energy in 2030; and 300GW of installed offshore wind and 40GW of ocean energy in 2050. This requires an approximate 30-fold increase in MRE capacity by 2050, divided into a 25-fold increase in wind energy capacity, and over 3000-fold increase in ocean energy capacity The Mediterranean region is meant to make a substantial contribution, targeting over 76 GW by 2050.[201]

According to a recent study that examined the Mediterranean region's wind resources, ocean depth, and environmental restrictions, Italy, Libya, Tunisia, and Greece are the countries best suited for the deployment of offshore wind. The Gulf of Lion and the Aegean Sea are the most favourable areas for offshore wind energy projects.

High offshore wind resources are also found in the offshore areas east and west of Crete, east of the Gibraltar Strait, in the western Ligurian Sea, in the Strait of Sicily and in the Otranto strait.[202]

While sea waves and swell exist in the Mediterranean, their current doesn't support significant energy production due to wave characteristics. However, localized production systems can be deployed, especially in island territories, to supplement their energy needs alongside other renewable sources like solar and wind.[203]

The most promising area for the installation of wave energy converters extends between Sardinia and the Balearic Islands, with an energetic potential of around 9.5 kW/m, the highest of the Mediterranean.[204]

Tidal currents in the Mediterranean are generally low in terms of the level and power produced. Therefore, the sea basin exception for low tidal level is located through the Strait of Messina, where energy production could reach 125 GW/h per year – an amount sufficient to meet the energy needs of cities such as Messina itself - thanks to currents reaching speeds of over 2.5 meters per second.[205] [206]

In terms of technology, floating offshore wind is a breakthrough innovation market, still in the pre-commercial stage, as opposed to offshore wind with fixed foundations that is currently operating commercially.

However, its development potential is limited mainly by the bathymetry of 40-50 meters deep.

The development of floating wind farms opens new opportunities in areas with deeper water (> 100 m) extending the available space for development and installation of plants.[207]

There are currently 20 floating offshore wind platform designs tested at sea and over 80 platforms at earlier stages of development. Some examples of floating offshore wind technologies being demonstrated are Eolink, SATH, TetraSpar and Floating Power Plant. The latest is an interesting hybrid platform that combines wave and wind energy generation.[208]

Technologies related to wave and tidal energy are now undergoing prototype testing and pilot project demonstration phases.[209]

Inertial Sea Wave Energy Converter (ISWEC) technology is one of the few Mediterranean concepts to have reached Technology Readiness Level (TRL) 7. The first ISWEC pilot plant (production of 105% of its rated power of 50 kW) has been active in Ravenna, Italy, since 2018.[210]

Over the past decade, numerous technologies (e.g. floating tidal energy converter, small-scale converters, multi-turbine platforms, etc.) have been designed and proposed.

200 Ibid page 1
201 Offshore Coalition for Energy and Nature (OCEaN) (2022) Offshore Coalition for Energy and Nature (OCEaN) to be expanded to the Mediterranean
202 Plan Bleu (2022) Towards Sustainable Development of Marine Renewable Energies in the Mediterranean.
203 Ibid, p.3
204 Ibid, p.3
205 Ibid, p.3
206 A. Cucco et al,. (2016) Hydrodynamic modeling of coastal seas: the role of tidal dynamics in the Messina Strait, Western Mediterranean Sea
207 Ibid, p.3
208 Edwards et al., (2023) Evolution of floating offshore wind platforms: A review of at-sea devices
209 Soukissian, et al., (2023) European offshore renewable energy: Towards a sustainable future
210 More information at: https://www.eni.com/it-IT/azioni/tecnologie-transizione-energetica/energie-rinnovabili/moto-ondoso.html

However, they are still in the concept/planning phase and it is projected that tidal energy may be deployed only in 2030, provided that major technology improvements are achieved and may be cost-effective in 2050.[211]

A large number of offshore wind projects are at a concept/ early planning stage, while many have been cancelled or remain in a dormant status in the Mediterranean.[212]

In April 2022, the first offshore wind farm in the Mediterranean was inaugurated off the coast of Italy, just a few hundred yards off the Port of Taranto.[213]

The project is a small installation of ten bottom-fixed 3.0 megawatt near-shore wind turbines. The turbines have a total combined capacity of 30 megawatts (MW) and an estimated output of 58,000 megawatt-hours (MWh) per year, enough to power 18.500 homes /60.000 people.[214]

In 2023, the European Investment Bank with the support of the European Commission co-financed three offshore wind farms deployed in France for a total of 210M€. It consists of 3 wind turbines of 8.4 MW located 17 km from the Gulf of Fos-sur-Mer and providing electricity for 45.000 inhabitants.[215-216]

Currently, offshore wind capacity in the Mediterranean represents only 0.1% of total capacity in Europe (2% if considering the Atlantic coast of Mediterranean countries).[217]

The project SPOWIND aims at addressing offshore wind energy potential in the Mediterranean Sea, overcoming challenges with a marine spatial planning WebGIS tool to support stakeholders in decision-making on suitable locations and technologies.[218]

There have been several deployments of wave energy technologies in the Mediterranean in the past few years, including, for example, 2022 Sigma Energy's 30kW device deployment in the Adriatic Sea in Slovenia, and Eco Wave Power 100 kW pilot project at the Port of Jaffa in Tel Aviv, Israel, connected to the grid in 2023.[219]

For tidal energy and ocean currents, ADAG and SeaPower are working towards the installation of a 300 kW in the Strait of Messina in Italy.[220]

Various factors (environmental, technological, economic and socio-political) may account for the delayed adoption of marine renewable energies in the Mediterranean region and the comparatively slower pace of business development in contrast to other maritime regions like the Atlantic or the North Sea.

- Conflicts among sea users are a significant concern in the Mediterranean Sea due to its diverse economic activities such as coastal tourism, fisheries, aquaculture, and maritime transport. The integration of marine renewable energy (MRE) will intensify the utilization of sea space, raising concerns about potential conflicts with existing sectors. Managing these interactions poses significant challenges, particularly in regulating conflicts between MRE and other sectors. Impacts on tourism and leisure activities vary based on offshore installation phases. Construction and decommissioning can disrupt tourism temporarily. Applying MSP is key to integrate the different ocean uses. Co-existence examples in Belgium, Germany, the UK and France show compatibility, with boat tours visiting wind farms within safety zones.[221] [222] Fishing faces restrictions in MRE sites, limiting fishing areas and navigation. However, preserving spawning and nursery areas can enhance fish stocks by providing artificial reefs for feeding and regeneration.[223] In the Mediterranean, the implementation of MSP is being slow since there is no sense of urgency due to the limited offshore wind development so far and also due to complexities in the geopolitical and socioeconomic context.[224]
- MRE poses environmental risks like changes in hydrodynamics, habitat loss, and collision risks.[225] Few studies address these risks fully due to the experimental nature of many MRE devices. To minimize impacts, preventive measures are crucial, including site selection through MSP. Spain and France utilize MSP to identify suitable MRE deployment areas, balancing economic interests with environmental protection.[226-227]

211 Soukissian et al, (2019) Marine Renewable Energy Clustering in the Mediterranean Sea: The Case of PELAGOS Project
212 Ibid, p.3
213 A. Buljan (2022) First Mediterranean Offshore Wind Farm Up and Running in Italy. OffshoreWIND.biz
214 More information at: https://renexia.it/en/beleolico/
215 European Investment Bank (2022) Press release: France: The EIB, with the support of the European Commission, is co-financing three floating offshore wind farms for a total of €210 million
216 More information on the Provence Grand Large wind farm: https://provencegrandlarge.fr/
217 OMEC (2023) Offshore Wind in the Mediterranean
218 More information on the SPOWIND project funded by Interreg MED: https://spowind.interreg-euro-med.eu/
219 Ocean Energy Europe (2023) Ocean Energy: Key Trends and Statistics 2022
220 IEA-OES (2023) Annual Report: An Overview of Ocean Energy Activities in 2022
221 Schultz-Zehden A. et al., (2018) Ocean Multi-Use Action Plan, MUSES project, Edinburgh
222 More information at: https://maritime-spatial-planning.ec.europa.eu/case-studies/boat-tours-saint-brieuc-offshore-wind-farm
223 Ibid, p.3
224 WWF Mediterranean Marine Initiative (2024). Enabling Sustainable Offshore Wind in theMediterranean through Ecosystem-Based Maritime Spatial Planning
225 Ibid, p.3
226 MITECO (2023) Plan de Ordenación del Espacio Marítimo, (Spain)
227 Mer Littoral (2030) Plan d'action du DSF de Méditerranée, (France)

- Limited social acceptance towards offshore energy could hinder authorization and commercial development. Growing social resistance is evident in communities along the Italian Adriatic shores and the Catalan coast in the Gulf of Lion. This reluctance stems from the Not-In-My-Backyard (NIMBY) phenomenon, where individuals support projects only if they're located outside their own community. A survey across 12 Mediterranean sites found that while marine renewable energy (MRE) remains relatively unknown (42% awareness), 70% expressed willingness to host installations in their areas.[228]
- Gaps in skills and workforce. Many sectors in the Blue Economy, including offshore renewable energy, have difficulties finding adequately qualified and skilled professionals, which hampers their growth.[229] The aging of the current workforce in shipbuilding, which is contributing to the fabrication of MRE devices, is adding pressure and urgency to the efforts to ensure replacement and avoid a loss of skills.
- EU lacks a unified regulatory framework for offshore renewable energy despite the requirement for Integrated National Energy and Climate Plans for 2021-2030. While some countries have integrated offshore renewables into their plans, many EU and non-EU nations lack a clear regulatory framework for MRE development (See table 1).
- Lack of centralized MRE governance leads to divided management responsibilities across departments, creating complex institutional frameworks. This hampers decision-making and results in confusing authorization procedures.
- Consenting process uncertainties include time delays, multiple applications, unclear procedures, repeated environmental assessments, extensive monitoring requirements, and limited design flexibility post-consent.
- EU lags China in ocean energy investment, receiving only a third of the funding. In 2022, European private investment was €15 million, down by half from 2021. This highlights the urgency for policy action and dedicated funding for large projects to compete globally.[230]
- Challenges in reaching commercialization include high technology costs, limited funding, and the need for reliability testing in marine environments. Marine energy development has been overshadowed by more cost-effective renewables like solar and land-based wind.
- Infrastructural barriers hinder MRE development due to inadequate electricity infrastructure. Grids lack optimization for MRE integration, requiring further development and anticipatory investment. Cost-sharing issues related to offshore grids, energy islands, and necessary integration grids must be addressed.

228 Betti G et al., (2022) Perceptions and attitudes toward blue energy and technologies in the Mediterranean area
229 EUROMESCO (2024) A sustainable blue economy for the Mediterranean: challenges, opportunities and policy pathways
230 Ibid, p. 4

FUTURE (2025-2030)

The revision of EU National Energy & Climate Plans (NECPs) in 2023 has been an excellent opportunity for Member States to revise and commit to ambitious objectives for ocean energy.

The new goals set a higher ambition level for installed capacity compared to the original strategy. The 2030 goals are nearly twice as high as the 61 GW ambition set out in the strategy.

This gives an overall ambition of installing approximately 111 GW of MRE generation capacity by the end of this decade and it rises to around 317 GW by mid-century.[231] [232]

Furthermore, there was a growing interest in setting, at the COP28 of November 2023, a global renewable target which would set a global ambition in line with the goals of the Paris Agreement.[233]

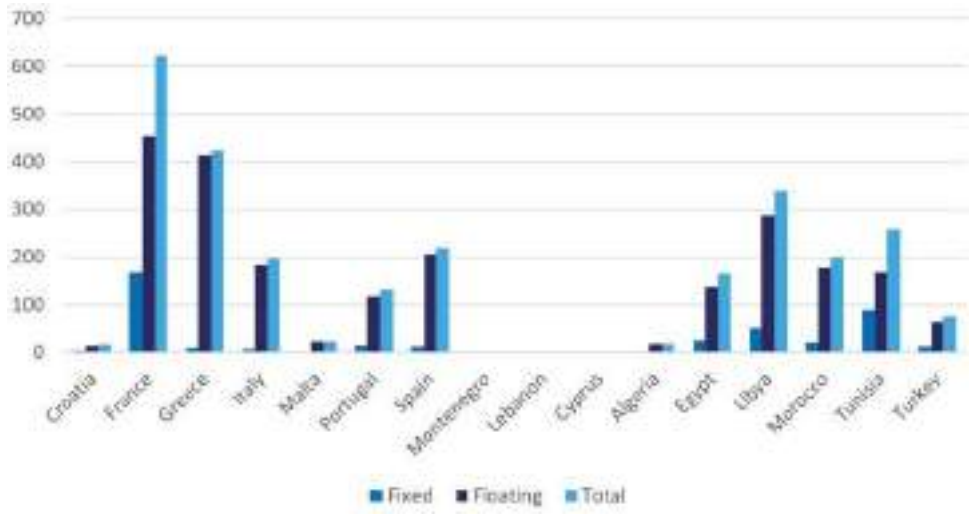
By 2030, the Mediterranean area expects an increased generation capacity of 400 GW from approximately 60% of renewable energy source; the corresponding electricity demand is approximately 2.53 PWh,[234] from which MENA countries have a demand of approximately 1.40 PWh.

Some Mediterranean countries are expected to double or triple the electricity demand by 2030 in comparison with the current consumption patterns.

This is the case of Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Türkiye, Cyprus and Albania.[235]

Figure 15 shows the estimation of the offshore wind generation capacity that could be technically feasible, considering only wind speed and water depth for most of the Mediterranean countries (estimations for countries such as Spain, Portugal, France and Morocco includes both shores, the Atlantic and Mediterranean).[236]

Figure 15 Offshore wind technical potential



Source: Own elaboration using ESMAP data (2024)

231 Ibid, p.3
232 European Commission (2023) Delivering on the EU offshore renewable energy ambitions
233 Ibid, p.6
234 Note: Petawatt-hour (PWh) units, commonly used to express the annual electricity generation for whole countries and the world energy consumption
235 Kaifeng Yu et al., (2023) Review of trans-Mediterranean power grid interconnection: a regional roadmap towards energy sector decarbonization
236 Energy Sector Management Assistance Program, n.d. Offshore wind technical potential: analysis and maps

Table 11 Review of national policy frameworks related to MRE, with a special focus on offshore wind, in the Mediterranean countries

NORTHERN MEDITERRANEAN

Country	Specific regulation for marine renewable energy	Policy context	Targets by 2030 and 2050
EU countries (in total)	Yes	European Commission Offshore Renewable Energy Strategy[237]	Offshore wind: 60 GW by 2030 and 300 GW of by 2050. Other marine renewable energies: 1 GW by 2030 and 40 GW by 2050.
Albania	No	Albania aims to boost renewable energy use, focusing on hydropower, solar, and wind. While wind energy is less established, the country is pursuing offshore wind projects with support from the European Bank for Reconstruction and Development (EBRD). Initial steps include studying wind energy resources.[238]	n/a
Croatia	No	Croatia's National Guide for Renewable Energy Projects lacks specific targets for MREs. However, the 2023 Action Plan for Renewable Energy Sources at Sea marks the country's first comprehensive study on sea-based renewables. It identifies suitable locations in the Adriatic Sea for wind farms and floating photovoltaic plants, setting targets for offshore wind generation.[239]	n/a
France	Yes	The MRE are fully included in the French National Energy & Climate Plan (2023).[240] Additionally, the French Blue Economy Strategy dedicates a full chapter for the development of MRE.[241]	5 GW in 2028 and 40 GW of offshore wind by 2050 (including Atlantic and Mediterranean shores).
Greece	Yes (under revision and pending of final approval)	Greece's Law no. 4964/2022 simplifies environmental licensing and establishes a framework for Offshore Wind Farms to address the energy crisis and enhance environmental protection. The National Energy and Climate Plan (NECP) targets 7 GW of wind energy by 2030, with at least 2 GW from offshore wind.[242] The Hellenic Hydrocarbons and Energy Resources Management Company is developing a draft National Offshore Wind Farms Development Programme, covering 25 areas totaling 2,712 km2 with an estimated minimum capacity of 12.4 GW.[243]	2.6 GW offshore wind target by 2030

237 European Commission (2020) An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future COM(2020) 741
238 Balkan Green Energy News (2022) Albania launches works on offshore wind project
239 University of Zagreb (2023) Action plan for the uptake of offshore renewable energy sources in Croatia
240 European Commission (2023) National Energy Climate Plan of France (Draft update - October 2023)
241 Secretariat général de la mer (2022) Les énergies marines renouvelables
242 Hellenic Republic Ministry of Environmental and Energy (2023) National Energy and Climate Plan Greece – Preliminary draft revised version - October 2023
243 HEREMA (2023) Press release: The Draft National Programme for Offshore Wind Energy, unlocking a natural wealth for clean energy and billions of euros investments

Country	Specific regulation for marine renewable energy	Policy context	Targets by 2030 and 2050
Italy	Yes	The National Blue Economy Strategy 2023-2025 (named Piano del mare)[244] and the National Integrated Plan for Energy & Climate (2023)[245] include the development of MRE in the country.	900 MW of offshore wind power by 2030
Malta	Yes (pending of consultation process)	Malta is currently developing its National Policy for the Deployment of Offshore Renewable Energy and going through a consultation process with the national stakeholders.[246] As part of this strategy, six floating offshore wind development areas have been identified.[247] The development of MRE is included in the draft National Energy & Climate Plan 2021-2030 updated in September 2023.[248]	400MW of offshore renewable generation capacity by 2050
Portugal	Yes	The National Strategy for the Sea 2021-2030[249] aims to enhance the contribution of the ocean to Portugal's economy, including 10 objectives and over 180 concrete measures, including Marine Renewable Energies. The offshore wind and wave power are both included in the Portuguese National Energy & Climate Plan (2023).[250]	370 MW of offshore wind and waves by 2030 and up to 1.3 GW of offshore wind by 2050 (including Atlantic and Mediterranean shores).
Spain	Yes	The MRE are included in the National Energy and Climate Plan 2021-2030.[251] Additionally, the Spanish Government has published a specific Roadmap for the Development of Offshore Wind and Energy in Spain (2021).[252] The Maritime Spatial Management Plans (POEM) include a selection of potential sites for the deployment of offshore wind farm (2023).[253]	Offshore wind energy 2030 target between 1-3G and marine energy 40-60MW (including Atlantic and Mediterranean shores).
EASTERN MEDITERRANEAN			
Israel	No	The country adopted a Blue Economy Strategy in 2018, in cooperation with the EU.[254] The Ministry of Energy is working to conduct a wind survey in the maritime space to examine the feasibility of establishing wind farms at sea. There is a special interest on combining wind farms with fish farming, areas for natural gas treatment infrastructure, etc.[255]	n/a

244 Gazzetta Ufficiale (2023) Approvazione del Piano del mare per il triennio 2023-2025
245 European Commission (2023) National Plan Integrated for Energy and Climate in Italy
246 Government of Malta (2023) National Policy for the Deployment of Offshore Renewable Energy: a draft for public consultation
247 Ibid, p.4
248 European Commission (2023) Malta Draft National Energy and Climate Plan 2021-2030
249 República Portuguesa (2021) Estratégia National para o Mar 2021-2030
250 European Commission (2023) Portuguese National Energy Plan and Climate 2021-2030 (Draft version June 2023)
251 MITECO (2020) Plan Nacional Integrado de Energía y Clima 2021-2030
252 Ministry for Ecological Transition and the Demographic Challenge (2022) Roadmap for the development of offshore wind and marine energy in Spain
253 Ibid, p.6
254 Israel National Center of Blue Economy. More information: https://www.blueconomy-il.com/about/
255 Planning Administration (2020) Maritime Policy for Israel's Mediterranean Waters.

Country	Specific regulation for marine renewable energy	Policy context	Targets by 2030 and 2050
Lebanon	No	Publication of the National Wind Atlas (2011) as the first step to create a growing momentum in Lebanon towards strengthening and developing the renewable energy sector in the country.[256-257]	n/a
Türkiye	No	Türkiye is currently conducting studies on four maritime areas earmarked for the declaration as offshore wind power zones in the Marmara Sea.[258]	n/a
		SOUTHERN MEDITERRANEAN	
Algeria	No	The objective number 7.4 of the Blue Economy Strategy focus on 'Explore, promote and develop alternative marine renewable energy. The specific actions are launching a study on the technically and economically exploitable potential of MRE in Algeria and join the Mediterranean Institute of Renewable Energies.[259]	n/a
Egypt	No	Currently plan to scale renewable energy capacity from 1 GW to 7.5 GW by 2020, likely to be through offshore wind.[260] The first action taken by the Egyptian government towards generating electricity from wind was the creation of the Egyptian Wind Atlas in 2005. However, no further measures have been reported regarding offshore wind.[261]	n/a
Morocco	No	Moroccan authorities aim to integrate onshore renewable energy into the national grid, targeting 52% renewable energy capacity by 2030. However, offshore renewables are not included in this plan.[262] In any case, the country has shown an interest on developing offshore wind, especially in the Atlantic shore. In 2022, the European Investment Bank has funded €2 million grant to undertake a feasibility study that could pave the way for an initial small-scale offshore wind energy pilot project in Morocco.[263]	n/a

256 UNDP (2013) The National Wind Atlas of Lebanon
257 Ibarra-Berastegi et al., (2019) Evaluation of Lebanon's Offshore-Wind-Energy Potential
258 Balkan Green Energy News (2023) Türkiye selects its first offshore wind power zones
259 People's Democratic Republic of Algeria (2022) National Strategy for the Blue Economy in Algeria - SNEB 2030
260 Mostafa Mahdy (2018) Multi criteria decision analysis for offshore wind energy potential in Egypt
261 New & Renewable Energy Authority Egypt (2022) Annual Report
262 Chakib Alaoui (2019) Review and assessment of offshore renewable energy resources in morocco' coastline
263 European Investment Bank (2022) Morocco: EIB supports Masen in assessing Morocco's offshore wind energy potential

Country	Specific regulation for marine renewable energy	Policy context	Targets by 2030 and 2050
Tunisia	No	Tunisia sets an example of including the importance of MRE, in particular, offshore wind, in the national blue economy strategy. As stated in the document 'In Tunisia, reflection on renewable energies from the sea is not yet on the political energy agenda. However, they can constitute an energy option for the future.'[264] Identified areas along its coast, such as Bizerte and Gabes, as potential sites for offshore wind development.[265]	n/a

Source: Own elaboration

264 World Bank (2023) L' économie bleue en Tunisie: Opportunité pour un développement intégré et durable de la mer et des zones côtières
265 Plan Bleu (2024) State of the Art of national regulations plans and strategies for the development of offshore wind power for the Mediterranean countries

Figure 16 Coupling offshore renewable energy sources to power the blue economy

Source: IRENA (2021)

For projects being built within the next three years, developers have already selected the type of foundation. In the long term, current trends suggest that monopiles will remain the standard. Jacket-type and gravity base foundations will be installed, especially when working on bottom-fixed sites in deeper waters. For floating wind projects, several designs are still under consideration, with semi-sub and spar being the most popular options taken so far. [266]

Ports and the offshore wind supply chain will have to engage early on to optimise logistical solutions that can allow the industry to deal with a wider range of projects. Europe's ports will need to invest €6.5bn between now and 2030 to enable the effective delivery of offshore targets within the National and Energy Climate Plans and for future growth.[267]

In terms of upcoming projects development, the company Renexia is projecting now the Med Wind project located in the Strait of Sicily, which consists of 190 floating turbines with an installed capacity of 2.8 GW and an estimated annual production of almost 9TWh.[268]

Additionally, two other smaller floating wind farms will be installed in Sardinia with an installed capacity of 825 MW and 555 MW. Similarly, France has taken further concrete steps by identifying the locations for two new 250 MW floating wind projects.

These projects will be subject to a competitive bidding process to be commissioned by 2031.[269]

Additionally, other projects are being developed aiming at de-risking future commercial projects. This is the case of the NextFloat project, officially launched in 2022, and backed by the European Commission with public funding of 16M€ plus private funding to demonstrate full-scale ovative platform design in the French coast.[270]

The Medfloat Pilot Parc is a pre-commercial pilot park with 3 to 5 units and a total potential of 50MW to be installed in an area located more 15 km from Cap de Creus on the Costa Brava (Catalonia, Spain) in 2025.[271]

According to EMODnet database, other MRE projects are currently under the 'planned' status in Spain, France, Italy and Greece.[272]

266 Wind Europe (2021) A 2030 Vision for European Offshore Wind Ports Trends and opportunities
267 Ibid, p.11
268 More information at: https://medwind.it/en/
269 A. Memija (2023) "France Pinpoints Location of Floating Offshore Wind Farms in the Mediterranean Sea," OffshoreWIND.biz
270 More information at: https://www.x1wind.com/projects/nextfloat-project-pre-commercial-unit-in-the-french-mediterranean-sea/
271 More information: https://saitec-offshore.com/en/projects/medfloat/
272 Wind farms database at EMODnet Map Viewer

Integrating MRE with desalination and aquaculture can mitigate power variability and cut integration costs. Although still in testing, multi-use platforms like the YDRIADA floating platform in the Aegean Sea showed potential.

However, the system was decommissioned after failing to meet freshwater demands.[273] Additional tests in the Red Sea demonstrated offshore wind and floating desalination compatibility, suggesting further real-world testing.[274]

The EU funded MUSICA project focuses on multiple use of space for island clean autonomy. During the project, a multi-use platform developed by the University of Aegean and EcoWindWater will achieve TRL 7.[275]

Ocean energy contributes to decarbonizing the power sector and supports various applications in the blue economy, such as shipping, cooling, aquaculture, and desalination. Proximity to harbors allows ocean energy to power ships and charging stations, while integrating with aquaculture systems facilitates fish farm operations. Renewable-powered desalination, including solar PV, wind, solar, and geothermal energy, enhances sustainability in the blue economy.[276]

However, some important aspects need to be duly addressed for the full development of the sector in the future. These key challenges need of policy actions at local, national, regional and Mediterranean level.

- Maritime spatial planning (MSP) integrates new ocean uses into policies, minimizing socio-cultural, environmental, and sectorial impacts of MRE projects. MSP should be included in energy/blue economy national plans. Ecosystem-based MSP and Strategic Environmental Assessments are crucial for impact prevention. Further assessment is needed to address cumulative effects due to scale, complexity of ecological processes, and inadequate baseline information. The use of sensitivity mapping can help to identify areas where developing of MRE may impact wildlife and therefore, should be avoided.[277]
- The inclusion of socioeconomics should be integrated as part of the MRE and impacts assessments. General public and local stakeholders should be able to participate in the MRE process (through surveys and consultations) and the local community should be benefitted from the development of MRE nearby (e.g. increase local employment, local electricity discounts, training schemes, etc).
- Regional cooperation should seek for further strengthening existing regional and subregional energy collaboration frameworks in the Mediterranean (e.g. MEDENER,[278] Med-Reg,[279] RCREEE,[280] OMEC,[281] COMELEC,[282] Med OCEaN[283]), promoting dialogue and exploring synergies amongst them; as well as promoting the incorporation of the topic of MRE development under their portfolio.[284] The Offshore Coalition for Energy and Nature in the Mediterranean Sea was born to facilitate discussions, advocate for offshore wind, grids and nature, to showcase solutions and collect innovative practices, create a common understanding and fill the knowledge gaps.[285]
- The creation of one-stop shop will help avoid overlaps between the authorities involved and contribute to integrated action in the marine environment. Similarly, the licensing process should be tailored to the needs of MRE generation activities, facilitating and speeding up the process. Governments should provide guidance and recommendations on permit-granting procedure, based on clear targets for MRE. The EC has recently launched guidelines with recommendations for speeding up permit-granting for renewable energy and related infrastructure projects[286] and also on how to designate renewable acceleration areas, where the deployment of renewable energy projects is not expected to have significant environmental impacts.[287]
- Infrastructure for MRE needs modernization and adaptation. Urgent facilitation of energy storage system grid integration is essential. Integrating wind farms into cross-country power interconnectors is crucial for supply security and efficient electricity trading. This paves the way for a fully meshed offshore grid (Super Grid) with energy hubs or islands.
- The promotion of demo and pilot projects, alongside the development of offshore test sites, is crucial for scaling up MRE prototypes adapted to Mediterranean conditions.
- Green incentive mechanisms should follow to support policy implementation and to help to reduce capital costs and operating support.

273 Ibid, p.3
274 I. Amin et al., (2021) Experimental study on the motion response of an integrated floating desalination plant and offshore wind turbine on a non-ship platform
275 More information at: https://musica-project.eu/about-us/
276 IRENA (2021) Offshore renewables: An action agenda for deployment
277 BirdLife International (2024). Sensitivity Mapping LIPU & BirdLife International
278 Mediterranean Association of National Agencies for Energy Management. More information at: https://www.medener.org/en/
279 Association of Mediterranean Energy Regulators. More information at: https://www.medreg-regulators.org/
280 Regional Center for Renewable Energy and Energy Efficiency. More information at: https://rcreee.org/
281 Organisation Méditerranéenne de L'energie et du Climat. More information at: https://www.ome.org/
282 Comité Maghrébin de l'électricité. More information at: https://maghrebemergent.net/sonelgaz-designe-a-la-tete-du-comite-maghrebin-de-lelectricite-comelac/
283 Ibid, p.2
284 UfM (2023) Roadmap to set the path towards the implementation of the 2021 UfM Ministerial Declaration on Sustainable Blue Economy
285 Offshore Coalition for Energy and Nature (OCEaN) (2024). The Offshore Coalition for Energy and Nature (OCEaN) Collaborations across EU sea basins
286 European Commission (2024). Recommendation and guidance on speeding up permit-granting for renewable energy and related infrastructure projects
287 European Commission (2024) Guidance on designating renewables acceleration areas

EMPLOYMENT

Regarding skills, the offshore renewable energies sector is growing. Today it accounts for around 80,000 jobs and is expected to create between 20,000 and 54,000 new ones in the next five years only in Europe.[288]

However, with such a rapid development access to skilled labour may become a challenge for the many specialised parts of the supply chains and offshore specific training will become more important as the activities at sea will grow.

In this context, the industry will have to address risks of skills shortages. The 27% of companies find difficult or very difficult to fill the job positions they offer within the MRE industry,[289] as similarly to other blue economy sectors, they also face the so-called "brain drain."[290]

According to the GWEC's Global Wind Report 2020, it is estimated that 17.3 direct jobs (defined as one year of full-time employment for one person) are created per megawatts (MW) of generation capacity over the 25-year lifetime of an offshore wind project,[291] i.e. around 4.000 job opportunities for a wind farm of 250 MW (such as the proposed wind farm project in France).

Current data suggests that there is still a long journey ahead to achieve real inclusion.

One example is renewable energy sector gender gap, where women are underrepresented in the workforce, and this is especially significant in wind energy sector where only 21% of the workforce is being leaded by women.

Furthermore, the female representation in wind energy sector is usually associated to administration roles and even lower in senior management roles.[292]

To overcome these challenges, efforts should be made towards:

- Supporting the development of new skills both for people working in or entering the industry, especially in digitalisation, ICT, robotics, environmental issues and health and safety. Five emerging trends have been identified related with MRE sector, including smart grid and smart sensors, big data, automation and advanced robotics, energy storage and 3D printing.[293]
- Improving the diversity and inclusiveness of the sector. This means supporting gender balance and attracting youth as well as those workers in transition from other sectors with the view to ensuring that the green transition is a just transition.
- It is crucial to match education provision and labour market needs, promote upskilling and reskilling schemes (specially in SMEs), improve communication and cooperation between education and industry, foster the attractiveness and awareness of career opportunities in the offshore industry, and improve the ocean literacy culture.
- The need for new business models, better private/ public cooperation between VET training and education providers and the industry creating sustainable new business models with focus on infrastructure for new VET learning environments i.e., work-based learning environment.

288 Ibid, p.6
289 FLORES (2024) Guidelines to promote innovative approaches in LLL for ORE
290 Ibid, p.5
291 Global Wind Energy Council (2021) Wind power & Green Recovery
292 IRENA (2020) Wind Energy: A Gender Perspective
293 Ibid, p.14

- Policymaking capacity and abilities are key in understanding the sector and acting swiftly to support its development, while ensuring the preservation of maritime ecosystem and local communities' interests – this is a complex area where greater support should be provided, including through exchanges of practices, twinning and pilot cases to be show-cased.

Key initiatives are underway to adapt curricula to MRE market needs and address sustainability, new technologies, and innovation challenges.

The Erasmus+ MATES project (2018-2022) established the Pact for Skills-Offshore Renewable Energy Partnership,[294] promoting qualification processes and upskilling opportunities for the MRE workforce.

Among the lines of action, the Partnership aims at developing an observatory of training needs, increasing the number of VET/University courses addressing MRE, tailoring curriculum for specific training needs and find financing opportunities to support the investment of companies in up and reskilling activities for their employers, among other lines of action.[295]

The Erasmus+ FLORES project (2023-2024) supports MRE stakeholders, featuring regional pilot actions tailored to Europe's sea basins.

The project counts with the participation of Mediterranean countries such as Spain, Italy, France and Greece.[296] Additionally, the Erasmus+ T-shore project develops training programs for offshore wind industry success.[297]

294 More information at: https://www.projectmates.eu/index.html
295 Pact for Skills (2021) Position Paper: Towards a Pact for skills in the ORE
296 More information at: https://oreskills.eu/
297 More information at: https://t-shore.eu/

Table 12 Skills needed for the Marine Renewable Energies industry

Hard skills	Soft skills
• Project management skills • Engineering skills (Electrical, structural, adaptation for decarbonisation in ORE maritime operations) • Operational and maintenance skills (Electro-mechanics, assembling, construction, welding, diving, marine operations) • Digital skills (ICT skills, remote control, data analysis, smart device handling, cybersecurity) • Offshore specific skills (Working at sea, working at heights, ORE technologies and their main principles, offshore site research such as marine geology, environmental, geophysical and geotechnical investigations) • Health and safety skills • Project design and planning skills (Engineering design, 3D design and visualization and numerical modelling) • Language skills	• Creative thinking and innovation • Critical thinking • Decision-making • Self-direction • Problem-solving • Foresight • Good communication competences • Self-investment mentality • Multidisciplinary approach • Collaboration competences • Flexibility and adaptability • Team management • Leadership and responsibility • Productivity and accountability • Negotiation skills • Environmental awareness

Table 13 Examples of what jobs I can expect / Job range

On land / office work	Mainly offshore work at sea
• Health, Safety and Environmental staff • Renewable energy project managers and staff • Project designers • Researcher and project developer • Energy Information Advisor • Environmental and Maritime Spatial Planning Consultants • Modellers and simulators engineers • Legal experts & Insurers • ITC services i.e. website services and designers • Remotely operated vehicle (ROV) pilot	• Water Sports Instructor • Boat - Maintenance, repair, cleaning services • Power boat skipper or instructor • Charter Vessel Operations

MARITIME SAFETY AND SECURITY

INTRODUCTION

Maritime Safety and Security (MSS) emerges as an essential pre-condition for the sustainable development of the sectors and activities of the Sustainable Blue Economy. On the one hand, MSS protects the safety and well-being of citizens and marine ecosystems by tackling environmental hazards, illegal activities, and protecting strategic resources and infrastructure at sea.

On the other hand, MSS is an essential requirement for enforcing the regulatory framework and ensuring predictability and certainty, which in turn is needed to secure investments and develop economic activities in the maritime domain.

The 2021 UfM Ministerial Declaration on Sustainable Blue Economy[298] recognized the importance of ensuring Maritime Safety and Security in the Mediterranean, placing an emphasis on its role in bolstering cooperation and understanding of maritime issues across countries.

Opportunities for innovation and progress abound in maritime safety and security sectors, including improving training, capacity building, technical support, and sharing knowledge and best practices across the Mediterranean basin were highlighted by the UfM countries.

Moreover, Mediterranean stakeholders[299] have recently acknowledged the need for further regional dialogue and cooperation in this strategic area, further working towards the interoperability of maritime safety and security services and enhancing information flows to adequately respond to new threats.

298 UfM (2021) Ministerial Declaration on Sustainable Blue Economy UfM (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages

299 UfM (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages

OVERVIEW

Given its unique and diverse ecosystem as well as its social, economic and historical richness, the Mediterranean region continues to face a persisting number of complex maritime threats and challenges (socio-economic, geopolitical, environmental and climatic) which are affecting the safety and the security of the region.[300]

Such security threats and challenges have multiplied in recent years. Traditional unlawful activities such as piracy, armed robbery at sea, human trafficking, smuggling of migrants, and trafficking of arms and drugs, along with terrorism, IUU fishing[301] and other illegal activities, including unauthorised exploration in the exclusive economic zones and the continental shelves of EU Member States, continue to pose serious challenges.

However, new and emerging threats such as heightened geopolitical rivalries, climate change impacts, marine environment degradation, as well as hybrid and cyber-attacks demand tailored attention and decisive and collective action.[302]

Security systems and coastguard cooperation in the Mediterranean basin: increased convergence in a (still) fragmented scenario

Despite ongoing efforts, there is still not a single security system so far 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 coastguard cooperation, surveillance and intervention capacities at transnational level.

The European Maritime Security Strategy (EUMSS)[303] and its related Action Plan,[304] established in 2014 and revised in 2023, constitute the framework through which the EU protects its interests at sea (i.e. citizens, economy, infrastructure, and borders); protecting the marine environment and resources; upholding international law of the oceans, and promptly reacting to growing and evolving threats.[305]

The EUMSS revision process identified the Mediterranean as the number one sea basin where the EU should take action to enhance maritime security.

Taking this into account, the revised EUMSS action plan comprises various actions aimed at enhancing maritime security in the Mediterranean, including:

- Enhancing capabilities of like-minded Mediterranean partner countries and share information, where appropriate, to enhance their ability to carry out maritime surveillance tasks, including with the aim of detecting and preventing unauthorised border-crossings and cross-border criminal activities.
- Developing training courses and facilitating the exchange of information, expertise, technical assistance, training and best practices among Union for the Mediterranean (UfM) countries to tackle illicit activities at sea, including through the MedCGFF and in line with the UfM SBE Declaration.
- Implementing GFCM Recommendations/International Inspection Scheme/Pilot Projects to improve the sustainability of fisheries resources, to support the fight against IUU.
- Conducting joint exercises and port calls with coastal like-minded countries, in order to strengthen the EU role as a global maritime security provider and enhance cooperation in maritime security.

The Common Information Sharing Environment (CISE),[306] is a network which facilitates structured and secure information exchange between maritime authorities of EU Member States, across sectors and borders, including civil and military authorities.

It contributes to enhancing maritime domain awareness and facilitate enhanced responses to the different challenges at sea (protection of critical infrastructure, protection of the borders, SAR, illegal traffic at sea).

CISE connects existing information exchange systems of the Member States. CISE is steered by the European Commission, whereas technical development was entrusted to EMSA, with support from the JRC.

300 More information at: https://governance.interreg-med.eu/no-cache/news-events/news/detail/actualites/increasing-safety-and-security-in-the-mediterranean-sea/

301 IUU may constitute a maritime security threat, particularly when linked to other ilegal activities. However, the EU framework for tackling IUU is the Common Fisheries Policy, and in particular the IUU Regulation (Regulation - 1005/2008 - EN - EUR-Lex (europa.eu)

302 European Comission (2023). JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the update of the EU Maritime Security Strategy and its Action Plan

303 Council of the European Union (2023) Council conclusions on the Revised EU Maritime Security Strategy (EUMSS) and its Action Plan

304 Council of the European Union (2018) Council conclusions on the Revised EU Maritime Security Strategy (EUMSS) and its Action Plan

305 European Comission (2023) JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the update of the EU Maritime Security Strategy and its Action Plan

306 More information at: https://www.emsa.europa.eu/cise.html

Over 300 EU and national authorities responsible for maritime surveillance and/or concerned by operations at sea - coordinated by the European Maritime Safety Agency (EMSA) - are participating in the development of this initiative, which entered its operational phase in July 2024.[307]

Notably, CISE ensures the interoperability of European and national maritime surveillance systems, facilitating automatic and secure information exchange among all relevant authorities connected to it.

In addition to this, the EU has set up the grounds for inter-agency cooperation between EFCA, EMSA and Frontex[308] to support national coast guard authorities, including in the field of maritime situational awareness.

At Mediterranean level, the SAFEMED project represents a flagship initiative in the enhancement of capabilities for strengthening maritime safety and security in the Mediterranean.[309]

It encompasses the following countries: Algeria, Egypt, Jordan, Israel, Libya, Lebanon, Morocco, Palestine and Tunisia.

The fifth phase of this long-standing project (SAFEMED V) began on 1 April 2022 and will end on 31 March 2028. With technical assistance, access to tools, and training, the project seeks to assist beneficiary countries with key safety-related challenges. The project also supports beneficiaries with the ratification, transposition, implementation, and enforcement of international maritime conventions.

Among its key components, SAFEMED provides technical assistance to enhance coastguard capabilities, particularly by providing support to the Mediterranean Coast Guard Functions Forum (MedCGFF), further detailed in box 3.

Figure 17 Domains covered by CISE

Source: EMSA (2021)

307 European Comission (2023) JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the update of the EU Maritime Security Strategy and its Action Plan

308 More information at: https://www.frontex.europa.eu/assets/Key_Documents/Working_Arrangements/WA_between_Frontex_EFCA_EMSA.pdf

309 More information at: https://www.emsa.europa.eu/neighbours/safemed-v.html

Box 3 Mediterranean Coast Guard Functions Forum (MedCGFF)

Plenary Meeting of MCGFF held in Naples, Italy on the 29th September to the -1st October 2022 | Source: UfM

The Mediterranean Coast Guard Functions Forum (MedCGFF),[310-311-312] born from an initiative promoted by the Italian Coast Guard in 2009 in Genoa, aims at enhancing cooperation and information sharing among Mediterranean countries in their effort to detect, monitor, deter and intercept transnational maritime threats to the global safety, security, economy and environment. The European Commission supports the MedCGFF (including the annual forum, training workshops etc.) through an annual grant from the European Maritime Fisheries and Aquaculture Fund (EMFAF).

With this overarching goal, the MedCGFF is working towards the achievement of enhanced coordination systems between regional coastguards for information sharing, capacity building, and developing a common level of operational standards and skills for coastguard functions bodies.

As key outcomes under this framework, whose Steering Group meets on a bi-yearly basis, several Exchange Missions for Partnership and Capacity Building have been organised to date, including the following:

1. Italian Coast Guard Headquarters/ Civil Protection Department (Roma, Italy)
2. European Maritime Safety Agency (Lisboa, Portugal)
3. OHQ Atalanta, (Rota, Spain)
4. Maritime Information Cooperation & Awareness Center (MICA Center- Brest/France)
5. Maritime Security Centre - Horn of Africa (MSCHOA) (Brest/France)

In 2022, the UfM were Observers to the latest CoastGuard Functions Forum held in Naples. As a non-binding, voluntary and independent forum which brings together representatives from institutions and agencies with competencies in Coast Guard Functions in the Mediterranean, the 2022 MCGFF was an important opportunity to facilitate multilateral cooperation on a range of common challenges including maritime safety, security and environmental protection activities, as well as enabling potential partnerships, sharing of expertise and best practices, and promoting international efforts to enhance the safety and security of activities in the Mediterranean Sea.

Along with the UfM, various international organisations and EU agencies were present, including WMO, REMPEC, EMSA, FRONTEX, EFCA and FAO. Key stakeholders were also brought together including Heads of Coast Guard Functions of the Mediterranean member countries, national representatives from competent Ministries, EU representatives from DG MARE and representatives from relevant projects and initiatives such as SAFESEANET, SAFEMED and the EUREKA Project.

310 More information at: https://www.emsa.europa.eu/safemed-iv-project/component-7-mediterranean-coast-guard-functions-forum.html
311 More information at: https://www.italiandefencetechnologies.com/in-naples-the-forum-of-the-functions-of-the-mediterranean-coast-guard/
312 More information at: https://en.sg.gov.tr/mcgff

Among the key items discussed at the 2022 Forum were the role of innovation in maritime transport with a focus on decarbonisation, digitalisation and automation; the role of Coast Guard Functions in preservation and response activities concerning the marine environment and related enforcement competencies; safety and security of activities at sea as a key enabler for the development of a resilient and sustainable Mediterranean Blue Economy; fisheries activities and control in the context of Next generation EU; global perspectives on Coast Guard cooperation; and the role of education and capacity-building in ensuring a safe, secure and sustainable Mediterranean.

DG MARE, as EU UfM Co-Presidency, recalled the potential of the MEDCGFF to 'enhance regional cooperation and promote collaboration on maritime issues of common interest related to Coast Guard Functions across borders and sectors, both civil and military' as highlighted by the 2021 UfM Ministerial Declaration on Sustainable Blue Economy which equally invites the Forum to develop training activities and further facilitate 'the exchange of information, expertise, technical assistance, training, and best practices to address illicit activities at sea'.

In addition to this, the MEDiterranean countries engaged in the INTERREG Med funded project **PANORAMED** called for a Multilevel governance strategy for Maritime Surveillance in the Mediterranean as a key pillar within the EU Integrated Maritime Policy. Such a strategy would aim at increasing complementarity between actors and systems, increasing connections with environmental issues, and promoting innovation with support of private stakeholders.[313]

All of these regional and sub-regional mechanisms are actively contributing to collectively addressing some of the "traditional" safety and security challenges in the Mediterranean region, including Illegal, Unreported and Unregulated Fishing, as well as human trafficking and smuggling, which are further detailed below.

Illegal, unreported and unregulated fishing (IUU)

Although the complete impact of illegal, unreported, and unregulated (IUU) fishing on fish stocks and marine resources in the Mediterranean remains unknown, it is estimated that IUU fishing globally results in the capture of up to 26 million tons of fish every year, valued at approximately USD 10-23 billion.[314]

In order to safeguard the depleted fish populations in the Mediterranean,[315] along with the numerous coastal livelihoods reliant on its marine resources, countries are working together to combat this issue.

Under the framework of the GFCM, the European Fisheries Control Agency (EFCA) is working with inspectors from Albania, Algeria, Bosnia and Herzegovina, Libya, Montenegro, Tunisia and Ukraine to ensure that inspections at sea are consistent across the region.[316]

Also, transnational projects such as **e-FishMed**[317] in the WestMED sub-sea basin are equipping countries with training and capacity building tools to tackle IUU.

Moreover, the **MedSeaAlliance**,[318] a coalition of NGOs, developed a data Atlas in 2022[319] which investigates illegal bottom trawling in areas of the Mediterranean where this activity is permanently restricted.

This tool allowed to identify, during the period of January 2020 – December 2021 incidents of potential bottom trawling by 305 different apparent vessels across 9518 apparent days of fishing activity, as well as 169 cases of confirmed infractions between 2018 and 2020.[320]

At EU level, the regulation to prevent, deter and eliminate illegal, unreported and unregulated fishing entered into force in 2010.[321]

"CATCH" is a recently developed IT tool to streamline checks and verifications of catch certificates for fishery products entering the EU market.[322]

The use of CATCH will become compulsory for EU operators and authorities for imports of fishery products as of January 2026.

Human trafficking and smuggling

Political instability stands out as a major factor determining migratory flows in the Mediterranean, making the Central Mediterranean one of the main routes for illegal crossings and smuggling networks.[323]

To tackle this issue, a range of measures have already been implemented in the region in borders protection, prevention and investigation of acts of smuggling and trafficking, in line with the UN Smuggling of Migrants Protocol.[324]

313 Interreg MED (2020) Policy paper on maritime surveillance
314 More information at: https://www.fao.org/gfcm/news/detail/en/c/1534258/
315 FAO (2023) The State of Mediterranean and Black Sea Fisheries 2023 - Special edition
316 More information at: https://www.fao.org/gfcm/news/detail/en/c/1403808/
317 More information at: https://efishmed-accp.efca.europa.eu/; https://westmed-initiative.ec.europa.eu/e-fishmed-engaged-in-the-blue-economy-and-the-fight-against-iuu-fishing/
318 More information at: https://www.medseaalliance.org/
319 More information at: https://atlas.medseaalliance.org/
320 More information at: https://marilles.org/en/post/detener-la-pesca-ilegal-en-el-mediterraneo
321 More information at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008R1005
322 More information at: https://eur-lex.europa.eu/eli/reg/2023/2842
323 Rourke (2023) EU Responses to Migration in the Mediterranean Basin
324 United Nations (2000) Protocol Against The Smuggling Of Migrants By Land, Sea And Air, Supplementing The United Nations Convention Against Transnational Organized Crime

Furthermore, currently two EU-NATO operations are active in the Mediterranean: the EU Naval Force Mediterranean (EUNAVFOR MED) Irini,[325] on the one hand, contributes to the disruption of the business model of human smuggling and trafficking networks through information gathering and patrolling by planes.

Additionally, the NATO Sea Guardian operation aims at supporting counter-terrorism efforts, including through the hailing (and potentially boarding) of suspect vessels.[326]

Addressing environmental risks related to shipping in the Mediterranean

The parties of the Conventions of the International Maritime Organization (IMO)[327] have assumed the primary responsibility of having an adequate and effective system in place with which to exercise control over ships entitled to fly their flag, thus ensuring that they comply with the relevant international rules and regulations.

Such rules aim at enhancing the capacity to prevent and react against manmade and natural disasters, including pollution from ships, in cooperation and with regional institutions,[328] namely the above-mentioned United Nations Environment Programme (UNEP) and its Mediterranean Action Plan (MAP) -UNEP/MAP-, as well as the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).

Other sub-regional initiatives in the Mediterranean such as the WestMED Initiative[329] and EUSAIR[330] also incorporate strategic priorities related to Maritime safety and security aspects.

Through the Barcelona Convention and protocols related to ship-based pollution (i.e. the 2002 Prevention and Emergency Protocol,[331] and the 1995 amended Dumping from Ships and Aircraft Protocol,[332] and the Hazardous Wastes Protocol[333]), UNEP/MAP provides a key framework for cooperation in terms of pollution prevention from ships. Moreover, it has played a stewarding role in the adoption by the IMO of the Mediterranean Sea Emission Control Area for Sulphur Oxides and Particulate Matter (Med SOx ECA), which is set to come into effect on 1 May 2025.[334]

Once Med SOx ECA comes into effect, ships operating in it will be required to comply with a limit for sulphur content in fuel oil (0.10 per cent mass by mass (m/m) versus 0.50 per cent m/m allowed outside Med SOx ECA). This implies a 78.7% drop in emissions of sulphur oxides and an annual reduction of 8.5 million tonnes of SOx released into the atmosphere. In addition to the benefits estimated on the maritime environment and human health, studies suggest that curbing SOx emissions will also bolster transport safety, as it would enhance visibility both inland and at sea across large swathes of North Africa and in the Strait of Gibraltar.[335]

In parallel, REMPEC, which was created with the objective of preventing and reducing pollution from ships and promptly preventing marine pollution spills, has identified maritime traffic as an important driver of marine pollution in the basin.[336]

In this regard, a recent study on trends and outlook of marine pollution (2022) developed by REMPEC has documented that, although a sharp decreasing trend in major shipping incidents in recent years has been observed, up to 1,500-2,000 incidences of operational oil spill are still estimated to occur annually in the basin.[337]

Moreover, non-indigenous species (NIS) have been increasingly spreading in the Mediterranean over the last decade, and low frequency noise has doubled each decade since 1950, causing adverse effects on marine organisms over different timescales.[338]

As a response to these issues, the Mediterranean Strategy for the Prevention of, Preparedness, and Response to Marine Pollution from Ships (2022-2031)[339] was adopted by the Contracting Parties to the Barcelona Convention in 2021 and sets out seven Common Strategic Objectives (CSOs), outlined in figure 18.

325 More information at: https://www.operationirini.eu/
326 More information at: https://www.nato.int/cps/en/natohq/topics_136233.htm
327 More information at: https://www.imo.org/en/About/Conventions/Pages/StatusOfConventions.aspx
328 More information at: https://www.imo.org/en/OurWork/Security/Pages/GuideMaritimeSecurityDefault.aspx
329 WestMED (2023) https://westmed-initiative.ec.europa.eu/wp-content/uploads/2023/06/WestMED-2023-Revised-Ministerial-Declaration-Final-Draft.pdf
330 More information at: https://www.adriatic-ionian.eu/pillars/2-connecting-the-region/
331 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/emergency-protocol-prevention-and-emergency-protocol
332 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/dumping-protocol-and-amendments
333 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/hazardous-wastes-protocol
334 More information at: https://www.unep.org/unepmap/news/press-release/mediterranean-historic-milestone-MedSOxECA
335 More information at: https://www.unep.org/unepmap/news/press-release/mediterranean-historic-milestone-MedSOxECA
336 More information at: https://www.rempec.org/en/news-media/rempec-news/study-trends-and-outlook-of-marine-pollution
337 REMPEC (2022) Study on trends and outlook of marine pollution. http://www.rempec.org/en/knowledge-centre/online-catalogue/studyontrends2022.pdf/@@download/file/StudyOnTrends2022.pdf
338 Ibid
339 UNEP/MED (2022) Decision IG 25/16

According to a recent update on implementation of the actions related to these objectives, countries so far seem to have focused their efforts on CSOs 1, 2, and 3.[340]

As a relevant example of activities implemented to address these first three objectives, through the EU co-funded initiative West MOPoCo, REMPEC and other regional partners have been supporting Algeria, France, Italy, Malta, Morocco, Spain and Tunisia in collaboration with Monaco in strengthening their cooperation in the field of preparedness for and response to oil and Hazardous and Noxious Substances (HNS).[341]

As a key outcome, a Manual to enhance emergency decision-making capabilities in response to Marine HNS[342] was developed in 2021. It provides comprehensive operational guidance for first responders and decision-makers on marine incidents involving NHS and provides a foundation for national frameworks based on the OPRC-HNS Protocol.

In addition, EMSA's CleanSeaNet,[343] a satellite-based oil spill and vessel detection service, has been offering assistance to beneficiary countries in identifying and tracing oil pollution on the sea surface; monitoring accidental pollution during emergencies, and contributing to the identification of polluters.

On the other hand, CSO 6 "Achieve a well-managed and pollution safe Mediterranean with integrated MSP and designation of special areas" currently appears to be the least covered priority.

Figure 18 Common Strategic Objectives (CSO) of the Mediterranean Strategy for the Prevention of, and Response to Marine Pollution from Ships (2022-2031)

Source: Rempec (2021)

340 REMPEC (2022) Study on trends and outlook of marine pollution
341 More information at: https://www.westmopoco.rempec.org/en/project
342 REMPEC (2022) Study on trends and outlook of marine pollution
343 More information at: https://emsa.europa.eu/csn-menu.html

Coastal and maritime protection and preservation

The United Nations Environment Programme (UNEP) and its Mediterranean Action Plan (MAP) - UNEP/MAP, with the overarching objective of enhancing the protection of the Mediterranean region's marine and coastal environment,[344] , provides a comprehensive institutional framework for cooperation to address marine environmental degradation – one of the main aspects affecting a safe and secure maritime space. The Barcelona Convention and its seven protocols adopted this framework constitute the main regional legally binding Multilateral Environmental Agreement (MEA) in the Mediterranean.

With a specific focus on coastal and maritime protection and preservation, the Protocol Concerning Specially Protected Areas and Biological Diversity[345] adopted in 1995 calls Parties to protect areas of particular natural or cultural value, particularly through the establishment of Specially Protected Areas (SPAs) or Specially Protected Areas of Mediterranean Importance (SPAMIs).

According to MedPAN, the Mediterranean network of Marine Protected Area (MPA) managers, 8.33 % of the Mediterranean Sea is under official designation of a protected statute. Of the total Mediterranean surface under protection statute, the vast majority (97.33%) is located in EU countries' waters.[346]

As a result, only 1,27% of the Mediterranean Sea is effectively protected, and mainly in the northern part of the region,[347] which is far from meeting the goal to classify 30% of the national maritime space as marine protected areas (MPAs) by 2030.[348]

In parallel, the Protocol on Integrated Coastal Zone Management in the Mediterranean[349] (ICZM Protocol), assisted by the Priority Actions Programme Regional Activity Centre (PAP/RAC), aims to ensure that Mediterranean countries better manage and protect their coastal zones, as well as providing with adequate tools for dealing with the emerging coastal environmental challenges.

344 More information at: https://www.unep.org/unepmap/
345 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/specially-protected-areas-protocol-spa-and-biodiversity-protocol
346 MEDPAN and UNEP/MAP-SPA/RAC (2021) The System of Mediterranean Marine Protected Areas in 2020
347 WWF (2019) Towards 2020: How Mediterranean countries are performing to protect their sea
348 More information at: https://sdgs.un.org/partnerships/classify-30-national-maritime-space-marine-protected-areas-mpas-2030
349 Official Journal of the European Union (2009) Protocol on Integrated Coastal Zone Management in the Mediterranean

FUTURE (2025-2030)

Growing and evolving threats to maritime security in the Mediterranean

In recent years, an evolution from 'traditional threats' (as detailed above) towards new, hybrid threats have been observed. These "new" threats include hybrid and cyber-attacks targeting critical maritime infrastructure, as well as climate change and environmental degradation.

Critical maritime infrastructure

The ocean now accommodates an expanding array of infrastructures. Where a century ago it primarily featured shipping lanes, ports, and telegraph cables, the surge in oceanic activities has spurred a remarkable proliferation of sea-based infrastructure.[350]

Modern commercial ports, maritime companies and ships are highly dependent on the operation of complex, dynamic Information Communication and Technology (ICT) systems and ICT-based maritime supply chains.[351]

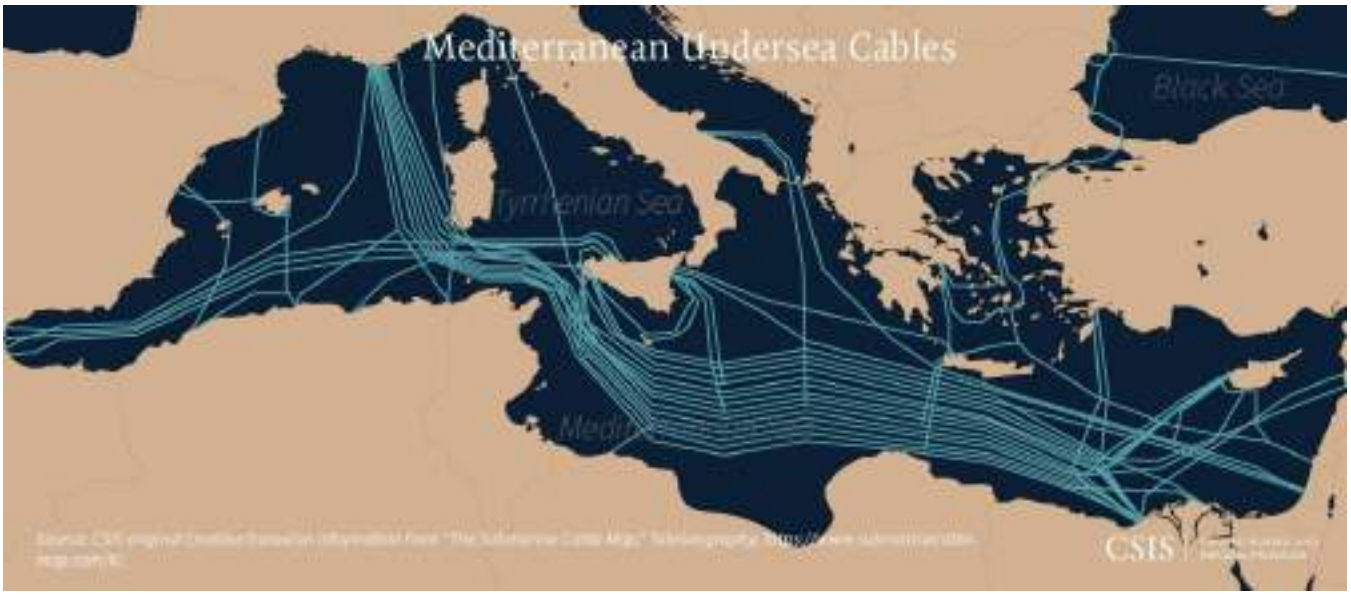
Growing concerns over cyber-attacks have since led to a substantial re-focusing on the vulnerabilities presented by the digitalization and automation of ports and shipping.[352]

Additionally, the extensive network of undersea cables in the Mediterranean region, serving as the backbone of a number of modern digital communication networks, stand out as key areas for security cooperation.[353]

Although the most common global threat posed to this type of infrastructure today is accidental (i.e. physical damage from commercial fishing and shipping), the two primary concerns are that the cables might be destroyed or tapped by either state or non-state actors.[354]

Furthermore, the emerging growth of offshore wind farms, a key aspect of the green energy transition, has resulted and will result in the near future in the establishment of new installations at sea, accompanied by a growing number of subsea electricity cables.

Figure 19 Undersea Cables in the Mediterranean basin



Source: Centre for Strategic and International Studies (2021)

350 Bueger, C. et al. (2023) Critical maritime infrastructure protection: What's the trouble?
351 European Comission (2023) Critical Maritime Routes Programme Monitoring, Support and Evaluation Mechanism (CRIMSON III)
352 Bueger, C. et al. (2023) Critical maritime infrastructure protection: What's the trouble?
353 More information at: https://www.rand.org/pubs/commentary/2023/05/navigating-complex-maritime-security-challenges-in.html
354 More information at: https://www.csis.org/analysis/invisible-and-vital-undersea-cables-and-transatlantic-security

All the maritime infrastructures mentioned above are considered "critical" since the interruption of their operations and services would have potentially disastrous impacts on national, EU and wider international trade as well as, occasionally, on human lives. Therefore, there is an increasing need to ensure physical security and cybersecurity against physical, cyber and hybrid attacks.[355]

In this sense, the EUMSS (2023) incorporates a specific priority related to boosting hybrid and cyber security qualifications, notably on the civilian side, and conducting training programmes, which will be open to non-EU Mediterranean partners.

Climate change and environmental degradation

The combination of climate change, alongside resource shortages and population growth in Africa, has the potential to generate significant instability in the region, exacerbating mass migrations towards Mediterranean coastlines, the radicalization and disruptions to food supply chains,[356] among many others.

With a view to enhancing countries' capacities for integrated climate risk analysis, UNEP recently developed the Strata data platform[357] to identify, map and monitor environmental and climate stresses potentially driving threats to peace and security.[358]

New technologies, market trends and applications for monitoring and surveillance

As a result of the growing needs for maritime safety and security, a number of opportunities now exist for the development and innovation across the sector. Utilizing cutting-edge technology, maritime authorities are in the process of attaining unparalleled surveillance and monitoring abilities across extensive maritime territories.

These advancements have proved to be able to improve relevant authorities' Maritime Domain Awareness, particularly by strengthening of threat detection and risk assessment processes.

These technologies include the use of Artificial Intelligence (AI), the creation of advanced radar systems, sonar technologies, unmanned systems, such as drones and autonomous underwater vehicles (AUVs), and real-time satellite imaging, allowing for the instantaneous tracking and recognition of vessels, particularly in remote areas with limited fishery patrol and aerial surveillance.[359]

At EU level, Copernicus Maritime Surveillance Services [360] are currently providing information services drawing from satellite Earth Observation and in-situ (non-space) data, including vessel identification and position information, behaviour patterns, and intelligence from users. Moreover, EFCA is in the process of developing integrated coordination tools further detailed in box 4.

With a growing demand of such technologies, new markets for the applications of innovative technologies are emerging 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.

Box 4 EFCA Integrated Maritime Services (IMS)

The EFCA Integrated Maritime Services (IMS)[361] is a coordination tool for operational fisheries control, established and accessible through the SafeSeaNet Ecosystem Graphical User Interface (SEG)[362] developed by the European Maritime Safety Agency (EMSA).

With a user base of over 500 registered fisheries control users, this collaborative service between EFCA and EMSA aids in supporting operations in both EU and International waters. It incorporates real-time maritime awareness by merging and cross-referencing Vessel Monitoring System (VMS), terrestrial automatic identification systems (AIS), satellite AIS, long-range identification and tracking (LRIT), as well as Vessel Detection Service (VDS) reports and satellite imagery provided through the Copernicus Maritime Services.

355 European Comission (2023) Critical Maritime Routes Programme Monitoring, Support and Evaluation Mechanism (CRIMSON III)
356 More information at: https://trendsresearch.org/insight/mediterranean-security-operations-irini-sea-guardian-and-mediterraneo-sicuro/
357 More information at: https://unepstrata.org/
358 More information at: https://www.unep.org/topics/fresh-water/disasters-and-climate-change/climate-change-and-security-risks
359 More information at: https://criticalmaritimeroutes.eu/role-of-technology-in-maritime-security.html
360 More information at: https://www.emsa.europa.eu/copernicus.html
361 More information at: https://www.efca.europa.eu/en/content/efca-ims-former-marsurv-service
362 More information at: https://www.emsa.europa.eu/ecosystem.html

Need for enhanced cooperation, collaboration and coordination

Further enhancing regional cooperation, particularly in key areas like maritime surveillance, information sharing, capacity building, and research, is vital to detect and prevent illicit activities that could harm the region socially, economically, or environmentally, particularly in view of "new" threats.

In this regard, 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. The role of the UfM could be critical in fostering cooperation, particularly by paving the road for the definition of common priorities.[363]

It is also crucial to continue reinforcing mechanisms that allow the exchange of information and data among different agents operating in the field, both military and civilian, and particularly between coastguards.

Capacity building, training and skills development of different stakeholders in the context of professional development schemes are essential, as detailed in the next section. The development of transnational projects scaling up success stories across the Mediterranean basin (for example the CISE mechanism described above) will also be instrumental.

At EU level, as part of the Practical handbook on European cooperation on coast guard functions, a training catalogue has been created,[364] covering all courses run by EU Agencies across all maritime domains. Moreover, the European Coast Guard Functions Training Academy Network project (ECGFA NET) put in place an exchange programme involving neighbouring countries and regional cooperation.[365]

An overview of relevant projects and initiatives currently reinforcing regional dialogue, cooperation and coordination in the Maritime Safety and Security domain is provided as follows:

Table 14 Projects and Initiatives related to Maritime Safety and Security

Project	Description	Funding Source	Period
SAFEMED V	SAFEMED brings together national, European and international stakeholders with the aim of raising the safety, security and protection of marine environment standards in the Mediterranean sea basin.	REMPEC/ EMSA	2022-2028
MEDOSMoSIS	MEDOSMoSIS aimed to develop modules and applications related to maritime surveillance activities and the facilitation of important exchange to support the further development of a regional/local smart plug-in capability supporting interoperable, transnational sectoral systems to ensure regional, deployable and mobile interface to enhance in-situ Situational Awareness in the Mediterranean Sea approach.	Interreg MED	2019-2022
LIFE4MEDECA	The LIFE4MEDECA project aims to build consensus and awareness on the creation of an area with low emissions of atmospheric pollutants in the Mediterranean (Emission Control Area – ECA). It therefore intends to accompany the process of affirmation of the low sulfur emission area in Mediterranean waters, also contributing from a technical and scientific point of view to demonstrating the effects for humans and the environment of more sustainable navigation.	LIFE	

363 UfM (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages
364 More information at: https://oceans-and-fisheries.ec.europa.eu/publications/handbook-european-cooperation-coast-guard-functions_en
365 More information at: https://ecgff.emsa.europa.eu/

Project	Description	Funding Source	Period
MEDEA	MEDEA aims to establish and operate the MEDEA network of multi-disciplinary security practitioners which focuses on border protection and natural disaster related tasks, engage participants in participatory governance on emerging security challenges in both the Mediterranean and the Black Sea region, push for the co-creation of security technology and establish and update the Mediterranean Security Research and Innovation Agenda (MSRIA) to identify areas where more research is needed for the establishment of recommendations and investment.	HORIZON 2020	2018-2023
E-FISHMED	The project "Mediterranean virtual regional training academy on fisheries control and inspection (eFishMed)" promotes cooperation in the fight against IUU fishing, the implementation of General Fisheries Commission for the Mediterranean (GCFM) and International Commission for the Conservation of Atlantic Tunas (ICCAT) conservation and management measures.	EMFAF	2022-2025
Awareness	The Awareness project seeks to raise awareness of both issues relating to maritime security in terms of border control as well as relating to the marine environment, sustainability and climate change in the Mediterranean and Atlantic sea basins. It aims to do so through development, testing and validation of EO based services, proposing a set of support/envelop services, and strengthen transnational collaboration on maritime awareness sector via knowledge transfer.	HORIZON 2020	2017-2021
PALAEMON	PALAEMON aims to engage innovative technologies in a new intelligent, sophisticated ecosystem of mass evacuation vessels (MEVs) in situations of maritime accidents and disasters.	HORIZON 2020	2019-2023

EMPLOYMENT

Increased maritime activity in the Mediterranean as the blue economy grows will lead to increased security challenges, and a high level of specialised education, skills and training will be indispensable to effectively tackle them, both currently and in the future.

In general, employment opportunities will emerge in particular for enterprises in the field of security, intelligence, logistics and services, environmental protection of natural resources, cyber-security, and monitoring.

These enterprises will need to integrate expanding technologies such as Artificial Intelligence (AI), automated systems technologies and big data, as technology integration becomes essential to keep up with the expansion of technology-driven solutions to maritime security and safety challenges.

Highly specialised knowledge of these technologies will thus be needed for such solutions to be effectively utilised.

Addressing new hybrid and cyber threats, which are anticipated to increase significantly in the future due to increased digitalisation, will require operators with strong digital skillsets and specific re-skilling and up-skilling programmes.[366]

Initiatives such as facilitating exchanges among military training schemes and promoting joint training endeavours among EU Member States' navies and diverse institutions will be key to enhancing interoperability and helping Mediterranean countries in responding to identified threats with greater effectiveness and coordination.[367]

All of these opportunities have significant potential for increased youth engagement, which is essential to ensure the advancement of maritime safety and security in the region.

Increased opportunities for young people through training programs, apprenticeships, vocational and higher education, scholarships and youth forums to involve young people in policy discussions and current affairs are ways in which increased youth engagement can be achieved.

Efforts to increase gender diversity and the participation of women should also be increased, given that the sector is currently male dominated.

The 18th May 2024 was the IMO´s International Day for Women in Maritime with the theme ‘Safe Horizons: Women Shaping the Future of Maritime Safety”. It recognised the crucial role women play in enhancing safety measures through various roles.[368]

The day affirmed that in general, recruitment should be targeted towards women in order to increase gender diversity in the sector, which requires more networking opportunities and the creation of development training programs for skill enhancement for women.

These opportunities can and should be supported by comprehensive gender-inclusive policies at the regional and national level.

366 More information at: https://www.consilium.europa.eu/media/67499/st14280-en23.pdf
367 Ibid
368 More information at: https://www.imo.org/en/OurWork/TechnicalCooperation/Pages/Women-in-Maritime-Visibility.aspx

Table 15 Skills needed for the Maritime Safety and Security industry

Hard skills	Soft skills
• Scientific research, data analysis, processing, monitoring, assessment • Knowledge and proficiency in emerging technology such as AI, big data and existing technologies • Knowledge of policies relating to international frameworks, regulations, policy, governance, and compliance • Entrepreneurship • Maritime security operations • Surveillance and monitoring • Emergency response / crisis management • Risk assessment	• Creative thinking and innovation • Critical thinking • Decision-making • Problem-solving • Foresight • Good communication competences • Multidisciplinary approach • Collaboration competences • Flexibility and adaptability • Team management • Leadership and responsibility • Negotiation skills • Environmental awareness

Table 16 Examples of what jobs I can expect / Job range

• Consultant • Maritime security officers / coordinators (ports, terminals) • Data Scientists, Analyst • Maritime Intelligence Analyst • Researcher • Policy analyst • Monitoring specialist	• Compliance officers, maritime law enforcement officer • Maritime safety inspector • Environmental compliance officers • Cybersecurity specialists • Maritime training instructors / education providers

Cross-Cutting Themes in the Mediterranean Sea

INTERACTIONS BETWEEN MARINE LITTER AND THE BLUE ECONOMY

INTRODUCTION

The Mediterranean Sea is one of the most heavily impacted regions globally by marine litter, where the accumulation of debris is comparable to that found in the large plastic patches formed in the subtropical gyres of open oceans.[369] Being densely populated along its coastlines (with approximately 150 million coastal inhabitants); it receives influxes of freshwater from densely populated river catchments.

Moreover, the region contributes to 15-30% of global shipping and attracts around one third of tourism activities worldwide. These anthropogenic pressures, combined with the specific geomorphological conditions of the basin (semi-enclosed and with anti-estuarine circulation) make this sea basin particularly sensitive to the accumulation of litter.

The 2021 UfM Ministerial Declaration on SBE[370] recognised the negative environmental and economic impact of plastic pollution, both micro and macro-plastic) on the marine environment, but also on key blue economy activities - notably tourism, fisheries, and aquaculture. In this sense, Mediterranean countries called for improving port reception facilities, to ensure proper collection and recycling of waste coming from all maritime activities; to exchange best practices to address the issue and invited UfM member countries to engage with fishers to involve them in the collection of marine litter at sea. Harmonization of marine litter monitoring methodologies remains a top priority.

Mediterranean stakeholders[371] have stressed how projects for marine litter prevention and mitigation in the Mediterranean need to be scaled up to regional and national levels. A multi-actor ecosystem, including local coastal communities and the industry, is vital for developing transformative solutions.

Awareness campaigns and educational activities are essential for engaging diverse audiences and promoting a paradigm shift, although clean-up efforts alone are insufficient for systemic change.

Social innovations and sustainable business models that emphasize eco-design, the 3Rs (Reduce, Reuse, Recycle), and sustainable financing mechanisms are critical. Decarbonizing economies and exploring digitalization opportunities, such as data analytics and remote sensing, can further support evidence-based decision-making and effective mitigation efforts for marine litter.

369 Jordà, G. and Soto-Navarro, J. (2023) An analogues-based forecasting system for Mediterranean marine-litter concentration
370 Union for the Mediterranean (2021) Ministerial Declaration on Sustainable Blue Economy
371 Union for the Mediterranean (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy: Outcomes and Main Messages

OVERVIEW

Marine litter is defined as any persistent, manufactured or processed solid material which has been discarded, disposed of, or abandoned in the marine and coastal environment.[372]

Though marine litter may consist of any synthetic or human made and processed item, most marine litter consists of plastic waste.

In fact, plastics constitute around 95 per cent of waste in the open sea, both on the seabed and on beaches across the Mediterranean.[373]

The annual plastic leakage into the maritime environment is estimated to be at 229,000 tonnes, 94 per cent of which consists of microplastics,[374] leading to the characterisation of the Mediterranean basin as a microplastic target hotspot.[375]

While this publication concentrates on marine litter, particularly plastics, it should be noted that other types of pollution are also present in the Mediterranean basin (e.g. chemical substances including pesticides, pharmaceuticals, etc.; biological pollution such as bacteria, viruses, and algae proliferation; as well as oil and noise pollution – which is further covered in the Maritime Safety and Security section).

Sources, pathways, and economic drivers of marine litter

There are several sources of marine pollution in the Mediterranean Sea, including land and sea-based. Around 80% of plastic particles enter the Mediterranean from land sources (coastal cities' runoff, sewage sludge and rivers), whereas 20% of pollution comes from sea-born activities such as shipping, tourism, and fishing.[376] Given their small size, microplastics can also enter the marine environment via atmospheric deposition.[377]

Land-based

The generation of (plastic) waste and its management remain a key challenge in many coastal Mediterranean countries and is a major source of marine pollution.[378] Plastic waste generation at global level has more than doubled over the last two decades.[379]

Per capita, however, Montenegro, Albania, Bosnia and Herzegovina and North Macedonia have the highest levels of leakage.[380]

Rivers, in connecting to other aquatic ecosystems such as downstream lakes and the coastal environment, constitute important pathways of plastic pollution from land into the marine environment,[381] where it then accumulates.

On average, 626 million floating items are discharged into seas surrounding Europe every year,[382] with the Mediterranean Sea receiving the largest share of more than one third of the total floating litter discharged by rivers modelled. High levels of microplastic pollution have also been detected.

Coastal and maritime tourism

At a global scale, beaches are one of the main land-based sources for litter to enter the marine environment through inadequate waste management, littering and illegal dumping.

Mediterranean beaches, extremely crowded during the summer, are particularly vulnerable since they are proven to be concentrated accumulation zones and one of the main gateways of litter to enter the marine system. It is estimated that the recreational use of Mediterranean beaches can generate up to 50% of the beach litter.

372 Vlachogianni, T (2022) Assessing the Amount of Marine Litter on Beaches of Mediterranean Coastal and Marine Protected Areas
373 IUCN (2020) The Mediterranean: Mare plasticum
374 UNEP (2022) Addressing marine litter in the Mediterranean in focus at Seville meetings
375 Sharma, S et al,. (2021) Microplastics in the Mediterranean Sea: Sources, Pollution Intensity, Sea Health, and Regulatory Policies
376 EU H2020 Sea Change project
377 Veiga, J., et al (2023) ETC/ICM Report 5/2022: Marine Litter in Europe - An integrated assessment from source to sea
378 European Parliament (2023) Research for REGI Committee : Actions of cities and regions in the Mediterranean Sea area to fight sea pollution
379 More information at: https://www.oecd.org/environment/plastics/
380 IUCN (2020) The Mediterranean: Mare plasticum.
381 Veiga, J., et al (2023) ETC/ICM Report 5/2022: Marine Litter in Europe - An integrated assessment from source to sea
382 More information at: https://www.eea.europa.eu/publications/european-marine-litter-assessment/from-rivers-to-the-sea

CROSS-CUTTING THEMES

Indicatively, the median beach macro-litter density at Mediterranean level was found to be 659 items per 100-metre of coastline (range: 128-2002 items/100m).[383]

This value is 5 times higher than the threshold value for beach litter set within the UNEP/MAP Integrated Monitoring and Assessment Programme (130 items/100m), and 33 times higher than the threshold value for macro-litter on beaches set within the EU Marine Strategy Framework Directive (20 items/100m).

Even in pristine environments of the Mediterranean, such as Marine Protected Areas, marine litter is building up threatening habitats and species and inhibiting sustainable development. The median beach macro-litter density for MPAs has been found to be from 7 to 147 times higher than the threshold value for macro-litter on beaches set within the Marine Strategy Framework Directive.

In addition, a recent study has found that the accumulation rates of marine litter on Mediterranean island beaches follow a seasonal pattern, increasing up to 4.7 times during the high season, representing a daily load of 106 items/day.

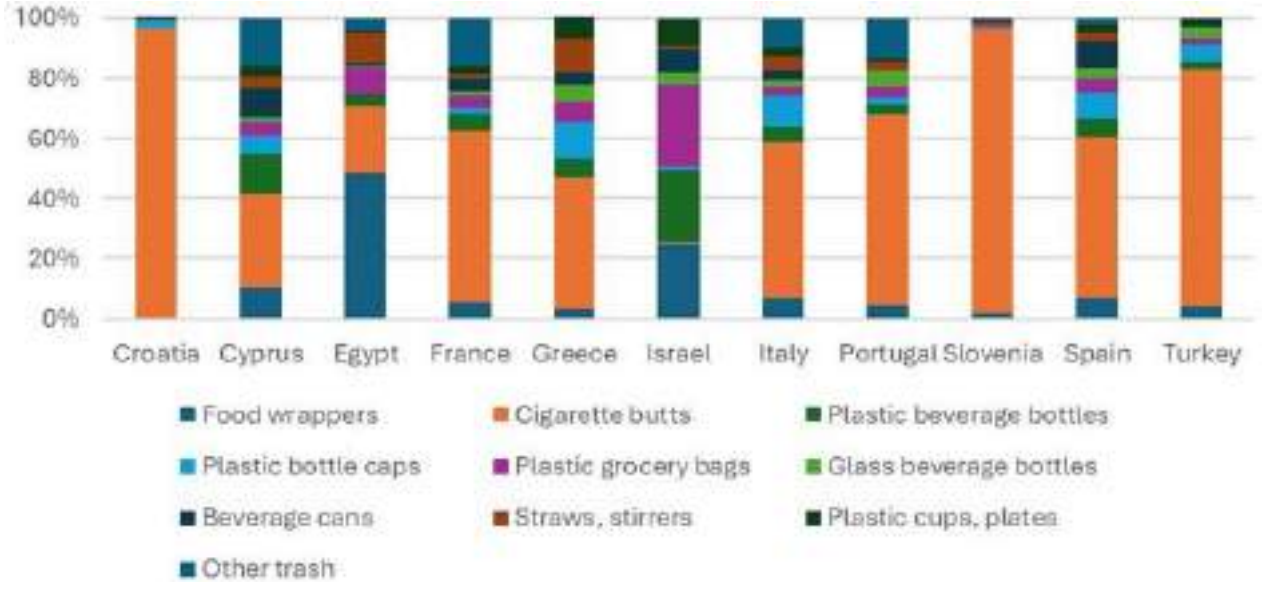
Every day, during the high touristic season peak (July-August), on every 100 m of beach, visitors will leave on average 844.5 items. This represents respectively 71.0% of the total amount of items composing the marine litter during this specific period.[384]

The most common items in Mediterranean beaches, as illustrated in figure 20, include cigarette butts (showing a much higher rate of marine litter from smoking related activities in the Mediterranean than the global average), crisp/sweet packets, cotton bud sticks, bags, and bottles.

As such, it is observed that single-use plastics represent more than 60% of the total recorded marine litter on beaches.[385]

In order to address the issue of single-use plastics, Mediterranean countries have reached a consensus to focus their efforts on tackling specific single-use items that hold paramount importance for the region.[386]

Figure 20 Top 10 marine litter items collected on Mediterranean beaches in 2022



Source: own, based on International Coastal Cleanup Report (2023)
Note: No data was gathered in Jordan, Malta, Albania, Algeria, Bosnia and Herzegovina, Lebanon, Libya, Monaco, Montenegro, Morocco, Palestine, Syria, and Tunisia

383 UNEP (2025) Marine litter assessment in the Mediterranean
384 The generation of marine litter in Mediterranean island beaches as an effect of tourism and its mitigation
385 More information at: https://www.unep.org/unepmap/resources/factsheets/pollution
386 More information at: http://www.cprac.org/en/news-archive/general/guidelines-to-tackle-single-use-plastic-products-in-the-mediterranean-region-a-

Sea-based

Fisheries (abandoned/lost fishing gear)

A significantly persistent form of marine litter present in the Mediterranean consists of abandoned, lost, or otherwise discarded fishing gear (ALDFG). The ability of this type of littering to "ghost fish" is one of the most significant impacts of ALDFG – this means that the derelict fishing gear continues to capture and kill fish and other marine animals (e.g. crustaceans, sea turtles, etc.) after it is no longer under the control of a fishing operation or individual fishers.[387-388]

It has been estimated that 17% of the litter found on the seafloor are mussel nets, fishing lines, fishing nets and other items linked to the activities of the fishery sector.[389]

In addition, the contribution of fisheries and aquaculture related items to the total number of items collected on European beaches has been found to be 15%.[390]

Moreover, a survey carried out in 11 Mediterranean countries targeting fishers showed that 37% of respondents admitted to eventually dumping it on land (illegal dumpsites), since according to the views of 67%, there are no specific collection points for derelict fishing gear at ports and marinas.[391]

In response to this issue, the General Fisheries Commission for the Mediterranean (GFCM) has agreed to develop, in collaboration with relevant partners, a regional adaptation strategy to cope with the potential effects of DFG on marine ecosystems as part of its 2030 Strategy.[392]

Similar findings are present when it comes to aquaculture. 2-15% of litter found on beaches, floating on the surface, or lying on the sea floor can be traced to aquaculture in the Mediterranean region[393] and in the Mediterranean Sea, the highest shares of aquaculture debris are found in the Adriatic Sea, mainly along the coast of Italy.[394]

Debris can strangle and kill marine life, break down into microplastics, impact recreational and cultural experiences and be ingested by marine organisms. Feed waste from aquaculture can also have a negative effect on the habitat and biodiversity of benthic ecosystems in the Mediterranean.[395]

Shipping

Rough estimates show that shipping lanes can generate up to 20,000 tonnes of sea-sourced plastic litter every year.[396]

Despite regulations which aim to encourage sustainable waste disposal in port reception facilities, it has been estimated that up to one third of litter generated by shipping is illegally discharged into the sea.[397]

Moreover, an assessment in four Mediterranean beaches located in the Adriatic and Ionian seas (2018) showed that sea transport is the dominant pathway affecting the amount and variability in beach litter loadings.[398]

The impacts of this type of littering and pollution in the Mediterranean basin are analysed in more detail in the dedicated section on Maritime Safety and Security.

Geographical distribution and hotspots of marine litter accumulation

Geographical distribution and hotspots of marine litter accumulation

A proper assessment of the distribution of marine litter is challenged by difficulties in observation, and reduced data availability and comparability, especially in deep-sea environments. However, data is accumulating, and studies are more and more becoming available.[399]

According to recent modelling studies, the regions with highest concentration of plastic particles are located in the Western Mediterranean, especially the Gulf of Lion and the northeastern slope of the Iberian Peninsula.[400]

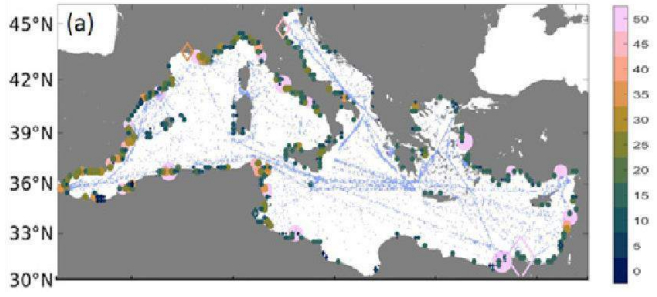
This could be explained by the larger coastal population and anthropic impact in this sub-sea basin.[401]

In this sub-basin, the regions with lower particle accumulation are located in the southern Tyrrhenian Sea (southeast of Sardinia), Ligurian and the Alboran Sea.

The lowest concentration points are found in the Eastern Mediterranean, and in particular in the northern Aegean and northern Ionian seas (<1.5 kg/km^2), although high concentrations can be found in the proximities of the Sicily Strait and the Gulf of Gabes, the Adriatic Sea and the slopes of the Levantine basin from Egypt to Türkiye , where accumulations range between 2 and 3 kg/km^2.

387 Ibid
388 More information at: https://oliveridleyproject.org/what-are-ghost-nets/ghost-fishing-cycle-of-devastation
389 More information at: https://mio-ecsde.org/project/5054/
390 Addamo et al (2017) Top Marine Beach Litter Items in Europe A review and synthesis based on beach litter data
391 UNEP/MAP (2015) Regional survey on abandoned, lost or discarded fishing gear & ghost nets in the Mediterranean sea
392 GFCM (2021) GFCM 2030 STRATEGY for sustainable fisheries and aquaculture in the Mediterranean and the Black sea
393 Ziveri, P., Grelaud, M. and Pato, J. (2023) Actions of cities and regions in the Mediterranean Sea area to fight sea pollution
394 More information at: https://aqua-lit.eu/resources/regional-maps-on-aquaculture-litter
395 Gonzçalez-Gaya, B. et al (2022) Effects of aquaculture waste feeds and antibiotics on marine benthic ecosystems in the Mediterranean Sea.
396 Actions of cities and regions in the Mediterranean Sea to fight sea pollution
397 More information at: https://www.eionet.europa.eu/etcs/etc-icm/products/etc-icm-reports/etc-icm-report-5-2022
398 Prevenios M. et al (2018) Beach litter dynamics on Mediterranean coasts: Distinguishing sources and pathways.
399 Cau, A., et al (2024) What, where, and when: Spatial-temporal distribution of macro-litter on the seafloor of the western and central Mediterranean Sea
400 Soto-Navarro, et al (2020) 3D hotspots of marine litter in the Mediterranean: A modeling study
401 Baudena, A., et al (2022) The streaming of plastic in the Mediterranean Sea

Figure 21 Spatial distribution of marine litter concentrations (in kg/km2)

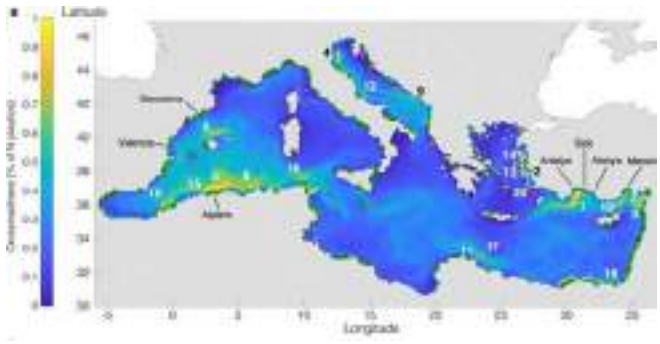


Circles indicate cities, diamonds represent river mouths, and points over the sea show shipping lanes.
Source: Jordà, G. and Soto-Navarro, J. (2023)

In parallel, a study from 2022 has inferred how certain Mediterranean regions function as "crossroads" through which large amounts of plastic debris flow.[402]

The study found that around 20% of Mediterranean plastic debris released every year passed through about 1% of the basin surface. The litter distribution, as shown in the figure below, has been observed to be particularly intense along the Algerian and southern Turkish coasts.

Figure 22 Crossroadness and plastic crossroads in the Mediterranean



Source: Baudena, A., et al (2022)
The streaming of plastic in the Mediterranean Sea

Impacts of marine litter on Mediterranean ecosystems and communities

Marine litter is a major threat for marine living organisms.[403]

Over 260 species (including invertebrates, fishes, turtles, seabirds, and mammals) have been reported to ingest or become entangled in plastic debris.

Moreover, marine litter may be colonised by microorganisms, and be used as a transport vector for non-native and invasive species, affecting marine ecosystems and their functioning.[404]

The UfM-labelled Interreg Med Plastic Busters MPAs[405] project research data have confirmed the high impact of plastic contamination on the Mediterranean biodiversity. Results show that 96% of the 1280 samples of 46 bioindicator species (i.e. invertebrates, fishes, turtles, cetaceans, etc.) analysed had ingested marine litter (including microplastics) (Fossi et al., 2022).

Marine litter also has a detrimental impact on coral reefs, by damaging the reef structure leading to injury and even death of vital corals, by depriving coral of light and oxygen thereby threating reef immunity to disease, and by effecting habitat variability and diminishing the favourability of the reef environment for macroalgal colonisation.

Marine litter can cause immune system damage and oxidative stress to corals and can inhibit the growth of mutualistic algae Symbiodinium.[406] Floating plastic can act as a carrier of invasive coral pathogens and microplastic pollution can cause coral disease.[407]

Recent studies have found that marine litter, like abandoned fishing gear, harms Mediterranean reefs, affecting 78 species, especially corals.[408]

The most common impact is entanglement, damaging corals, and other marine life.[409] However, knowledge about this issue varies across regions, with some areas lacking research.

Despite existing laws and agreements, more efforts are needed in terms of monitoring in order to fully understand the impact of marine litter on Mediterranean reefs.

402 Baudena, A., et al (2022) The streaming of plastic in the Mediterranean Sea
403 Soto-Navarro et al (2021) Impact of the marine litter pollution on the Mediterranean biodiversity: A risk assessment study with focus on the marine protected areas
404 Plan Bleu (2019) Tackling Marine Litter in the Mediterranean: Knowledge and Tools
405 More information at: https://biodiversity.uma.es/plastic-busters-mpas-project/
406 Nama, S., et al (2023) Impacts of marine debris on coral reef ecosystem: A review for conservation and ecological monitoring of the coral reef ecosystem
407 Ibid
408 Angiolillo, M., et al (2020) Impacts of Marine Litter on Mediterranean Reef Systems: From Shallow to Deep Waters
409 Ibid

In addition to its negative environmental effects, marine litter represents a shortfall for local coastal economies, with negative impacts on some of the blue economy sectors which constitute, at the same time, an economic driver for litter.

For example, in many countries, including those from the Mediterranean region, the absence of litter influences visitors' choice and the probability to return to a given beach is strongly associated to the quality of the coastal environment.[410]

Similarly, the prevalence of ghost fishing gear in the marine environment has the potential to damage boats, posing navigation hazards and safety concerns, contributing to the depletion of stocks, as well as resulting in additional costs resulting from fouling vessels and other gear.[411]

Policy context

To address the issue of marine pollution in the Mediterranean, several international, regional, and local agreements are involved, including:

Table 17 Main global, Mediterranean, and European policies and legislations related to marine litter and Mediterranean coastal and marine protected areas

GLOBAL CONTEXT

Key policy frameworks	Description
UNEA Resolution on a Plastics Treaty (2023)	An international legally binding treaty on plastic pollution is currently under development. The treaty is to include a series of technical provisions, that would consider how to promote sustainable production and consumption of plastics from product design to environmentally sound waste management, through resource efficiency and safe and just circular economy approaches.
UN Convention on Biological Diversity (1993 & 2016)	Convention - Parties are urged "to develop and implement measures, policies and instruments to prevent the discard, disposal, loss or abandonment of any persistent, manufactured or processed solid material in the marine and coastal environment (Decision of 2016 XIII/10 on addressing impacts of marine debris on marine and coastal biodiversity, points 6 and 8).
UN 2030 Agenda for Sustainable Development (2015)	Action plan - Sustainable Development Goal N. 14 - By 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution.
MARPOL Convention - Annex V "Prevention of Pollution by Garbage from Ships" (1988)	Convention - Annex V related to controlling and preventing pollution from garbage, meaning pollution from solid waste, including plastic waste.

410 Grelaud, M., et al (2020) The generation of marine litter in Mediterranean island beaches as an effect of tourism and its mitigation
411 Ocean Conservancy (2022) The impact of fishing gear as a source of marine plastic pollution

MEDITERRANEAN CONTEXT

Key policy frameworks	Description
UfM Ministerial Declarations on Sustainable Blue Economy (2015 and 2021) and related SBE Roadmap	Policy framework - The 2015 Declaration set a strategic agenda for sustainable economic growth in the Mediterranean, emphasizing sustainable development, regional cooperation, innovation, support for SMEs, environmental protection, improved governance, education, and climate change adaptation. The 2021 version builds on these foundations, reinforcing commitments and addressing new challenges by promoting sustainable investment, integrating digital technologies, and expanding the scope of cooperation and innovation in the blue economy. Both declarations aim to align the policies of UfM member states towards a collective vision of a sustainable and prosperous Mediterranean region.
UfM Ministerial Declaration on Environment and Climate Change (2014 and 2021) and related GreenerMed Agenda	Policy framework – set a framework for regional cooperation to address environmental challenges and climate change in the Mediterranean, emphasizing sustainable development and green technology investments. The 2021 version expanded these commitments, calling for stronger cooperation and innovative solutions to new environmental challenges. The GreenerMed Agenda complements these declarations by promoting green growth, resource efficiency, and ecosystem protection, aiming for a low-carbon, circular economy in the Mediterranean region.
Regional Plan on the Management of Marine Litter in the Mediterranean (Barcelona Convention) (2013 & 2021)	Action plan - The main objectives are to prevent and reduce to the minimum marine litter pollution in the Mediterranean and its impact on ecosystem services, habitats, species, public health, and safety; remove to the extent possible already existent marine litter; enhance knowledge on marine litter.
2030GreenerMed Agenda (Thematic Axis 2) (Union for the Mediterranean) (2021)	Agenda - It will support actions to prevent and reduce pollution on the land, sea, and air from different sources, focusing on plastic pollution and marine litter, strengthening the mechanisms for their prevention, facilitating investments in infrastructure, and promoting nature-based solutions whenever feasible.
Integrated Monitoring and Assessment Programme of the Mediterranean Sea (IMAP) (Barcelona Convention) (2016)	Programme - a key achievement for the Mediterranean region for quantitative, integrated analysis of the status of the marine and coastal environment based on common regional indicators, targets, and Good Environmental Status descriptions - EO 10: Marine litter: Marine and coastal litter do not adversely affect the coastal and marine environment.
The Ecosystem Approach (EcAp) (2008)	The EcAp process seeks to reach the ultimate objective of achieving Good Environmental Status (GES) in the Mediterranean Sea. To this end, contracting parties have agreed to protect and restore the structure and function of marine and coastal ecosystems thus also protecting biodiversity, in order to achieve and maintain good ecological status and allow for their sustainable use. Ecological Objective deals with marine litter.

EUROPEAN CONTEXT

Key policy frameworks	Description
EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' (2021)	Action plan - The 2021 Zero Pollution Action Plan, a key deliverable of the European Green Deal puts forth key targets to speed up reducing pollution at source. Target 5 addresses the improvement of water quality by reducing waste; by 2030 the EU should reduce by 50% plastic litter at sea and 30% microplastics released into the environment. Furthermore, the significant reduction of waste generation and by 50% residual municipal waste, is aimed at.
Directive (EU) 2019/904 on the reduction of the impact of certain plastic products on the environment (SUP Directive) (2019)	EU Directive - Where sustainable alternatives are easily available and affordable, single-use plastic products cannot be placed on the markets of EU Member States. Different measures are being applied to different products. For other single-use plastic products, the EU focuses on reducing consumption, introducing design requirements, labelling requirements, and Extended Producer Responsibility (EPR) schemes. Regulation on fishing gear is also included.
Directive (EU) 2019/883 on port reception facilities for the delivery of waste from ships (2019)	EU Directive - It regulates the discharges of waste from ships by improving the availability and use of adequate port reception facilities and the delivery of waste, including derelict fishing gear from the fishing sector. The directive further targets "fished waste" (waste collected in nets during fishing operations).
EU Strategy for Plastics in a Circular Economy (2018)	Strategy – The first EU-wide policy framework adopting a life-cycle approach integrating design, use, reuse, and recycling of plastic products.
Directive (EU) 2018/852 amending Directive 94/62/EC on packaging and packaging waste	EU Directive - Amending Directive 94/62/EC on packaging and packaging waste. The latest amendment contains updated measures to prevent the production of packaging waste and promote the reuse, recycling, and other forms of recovering packaging waste. It also sets specific targets for recycling by 2025 and 2030.
Westmed Ministerial Declaration 2023	Adopted in June 2023, the Declaration point II.b calls for “Stepping up efforts to tackle air and marine pollution, with a specific focus on marine litter, including on macro and micro plastics”.

As shown in the Table, in order to protect the Mediterranean Sea against pollution from land-based sources and activities, an amended version of the UNEP/MAP Barcelona Convention "LBS Protocol" was adopted in 2008, with the aim of reducing and phasing out substances that are toxic, persistent and liable to bioaccumulate in the marine environment (including marine litter, but also Persistent Organic Pollutants (POPs), mercury, etc.).[412]

Moreover, the Regional Plan on Marine Litter Management in the Mediterranean[413] was adopted in this context as a legally binding instrument in 2013, setting specific measures and operational targets to achieve Good Environmental Status in the Mediterranean Sea, including a basin-wide marine litter reduction target of 20% of beach litter by 2024.

Recently, the Regional Plan on Marine Litter Management in the Mediterranean in the Framework of UNEP/MAP has been updated, and region-wide Guidelines were adopted, including: (a) Adopt-a-Beach; (b) Phase-out of Single Use Plastic Bags; (c) Provision of Reception Facilities in Ports and the Delivery of Ship-Generated Wastes; (d) Application of Charges at Reasonable Costs for the Use of Port Reception Facilities.[414]

At the EU level, several Directives have been introduced which directly tackle the issue of marine litter and pollution. Most recently, Directive EU/2019/904 on Single-Use Plastics[415] aims to reduce the impact of single-use plastic products on the environment, requiring measures to prevent and clean up plastic litter as well as regulations on the use of fishing gear.

Directive 2008/56/EC Marine Strategy Framework Directive[416] establishes a framework for protecting the marine environment across EU member states through the development of national marine strategies which obligates member states to develop programs of measures to address marine litter.

Directive 2005/35/EC[417] and Directive 2000/60/EC[418] both aim to address issues of water quality and microplastics.

In 2022, the European Commission proposed a revision of the MSFD to update targets and requirements within it, aiming to progress further toward the directive's objectives. A comprehensive analysis conducted by the Joint Research Centre[419] on the 2018 reporting from 21 EU member states relating to marine litter under Descriptor 10 of the MSFD has revealed important insights about the progress of achieving GES in this area.

Regarding Descriptor 10, which covers surface litter, seabed litter, microlitter, ingested litter and the adverse effects on marine life:

- Relating to litter generally (D10C1), an uneven emphasis on assessments between coastlines and seabeds was observed, with only 11 of 21 member states reporting on surface waters. Reporting of litter often employed a generalised 'macrolitter' category which hindered the compatibility and standardisation of data.
- Assessments for microlitter (D10C2) predominantly concentrated on surface waters with limited reporting for coasts and seabeds. The most frequently reported category was 'artificial polymer materials'. Very few member states undertook assessments for ingested criteria (D10C3) and adverse effects on biota (D10C4) due to an absence of agreed methodologies.
- Only 13 member states provided quantitative threshold values in their reports from various sources, resulting in numerous assessments marked as 'unknown' due to a lack of agreement on threshold values. This led to a majority of member states not reporting on their GES achievement.
- Substantial disparities emerged among member states regarding the spatial coverage and assessment periods utilised for evaluating D10 criteria, posing challenges in integrating assessments at regional and EU levels.

412 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/lbs-protocol-and-amendments
413 More information at: https://www.unep.org/unepmap/news/news/regional-plan-marine-litter-management-mediterranean-prevent-and-eliminate-pollution
414 UNEP/MED (2021) Decision IG.25/9
415 Official Journal of the European Union (2019) DIRECTIVE (EU) 2019/904 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the reduction of the impact of certain plastic products on the environment
416 Official Journal of the European Union (2008) DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for community action in the field of marine environmental policy
417 Official Journal of the European Union (2005) DIRECTIVE 2005/35/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on ship-source pollution and on the introduction of penalties for infringements
418 More information at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32000L0060
419 Ruiz-Orejón L.F., Tornero V., Boschetti S.T., Hanke G., Marine Strategy Framework Directive - Review and analysis of EU Member States' 2018 reports - Descriptor 10: Marine litter, EUR 30665 EN, Publications Office of the European Union, Luxembourg, 2021, ISBN 978-92-76-34263-2, doi:10.2760/238367, JRC124701.

In order for the MSFD to effectively protect Europe's marine environment, enhanced implementation remains critical. Specifically, there is a need to develop standardised methods to enable assessments in these areas relating to D10.

This includes efforts at developing and harmonising threshold values, creating a common methodology for GES determination and standardising spatial coverage and assessment periods to be able to effectively integrate assessments at various levels.

Furthermore, the Mission to Restore our Oceans and Waters by 2030[420] and its Mediterranean Lighthouse, BlueMissionMED, provide a structuring platform strengthening the R&I ecosystem in order to achieve zero-pollution in the region.

Moreover, amidst growing concerns over the escalating threat of marine plastic pollution, the delegates of COP22 convened in Antalya in 2021 to forge a united front against this environmental crisis.

The outcome of this historic meeting was the COP22 Antalya Ministerial Declaration,[421] a decisive and far-reaching plan aimed at leaving a lasting legacy of pristine beaches and unpolluted waters across the Mediterranean region.

Recognizing the significant contribution of inland sources to marine plastic pollution, the COP22 Antalya Ministerial Declaration emphasized the development of guidelines for monitoring marine litter inputs from rivers.

The Declaration also called for the inclusion of a dedicated chapter on marine litter in the 2023 Mediterranean Quality Status report, ensuring a comprehensive regional assessment and measuring progress in tackling the crisis.

Most recent developments include the 2022 UN resolution "End Plastic Pollution: Towards an internationally legally binding instrument"[422] based on a comprehensive approach to address the full life cycle of plastic, including production, design, and disposal, with 175 nations agreeing to develop the legally binding agreement by 2024.

In tackling the root causes of pollution and promoting more sustainable practices, the resolution marks an important step in combatting marine litter, since a significant portion of it is comprised of plastic waste.

In this framework, negotiations to reach a global plastics treaty are ongoing.

Box 5 Litter-free is the way to be

The Union for the Mediterranean's 2021 Policy Brief "Litter-free is the way to be"[423] was crafted in response to the growing threat of marine litter and plastic pollution, notably in the Mediterranean Sea. Its primary objective was to address the multifaceted implications of plastic pollution on the environment, economy, society, politics, and culture, with a specific emphasis on the Mediterranean region. The document emphasizes the need to adopt a circular approach to tackle the problem, avoiding the use of environmentally harmful materials and promoting sustainable resource use.

It also acknowledges that plastic pollution is not only a marine pollution issue but also contributes to air pollution and climate change. Plastic emits greenhouse gases at every stage of its life cycle, from production to disposal.

Additionally, the paper highlights the importance of strengthening cooperation among Mediterranean initiatives and developing harmonized approaches for monitoring and managing marine litter. Furthermore, the document underscores the importance of adopting a systemic and interconnected approach to combat marine litter, addressing both the direct and indirect impacts of human activities on marine environments and biodiversity.

Source:https://biodiversity.uma.es/download/82/plasticbusters-mpas/2419/policy-paper.pdf

420 More information at: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters_en
421 UFM (2023). Litter-free is the way to be: actions for a healthy Mediterranean
422 UNEP/MED (2021) Antalya Ministerial Declaration
423 UNEP (2022) UNEA Resolution 5/14 entitled "End plastic pollution: Towards an international legally binding instrument"

FUTURE (2025-2030)

The ambitious transformation objectives set out by regional policy frameworks and initiatives described in the previous chapter are heavily challenged by global trends including rapid population growth, rising per capita plastic use, shifts to low-value/hard-to-recycle materials, and disproportionate growth in markets with low collection.

In this sense, it has been estimated that, under Business-as-Usual conditions, plastic leaking into the oceans worldwide could triple by 2040.[424]

Reverting these trends and effectively tackling the issue of marine litter from the source would require a shift to circular economies, which implies transforming the linear "take-make-use-dispose" paradigm by introducing -by design- the principles of restoration, regeneration, re-use, sharing, and other practices contributing to the overall extension of products' life cycle.[425]

In a circular economy scenario, the volume of plastics entering the marine environment could be reduced by 82 per cent in 2040.[426]

The circular economy shift encompasses multi-level, holistic approaches involving policy interventions, technological innovations, public awareness campaigns, and international cooperation.

The uptake of sustainable/ circular solutions and business models will be key to drive the transition forward. Entrepreneurs and start-ups are gradually introducing viable alternatives to plastic packaging and other sources of pollution in the Mediterranean, including eco-design principles and bio-based materials as plastic alternatives.[427]

Regional initiatives such as The Switchers Support Programme[428] are catalysing transformative business solutions to fast-track the transition to circular economy models across sectors and value chains.

Progressive adoption of Extended Producer Responsibility (EPR) schemes is also observed in some Mediterranean countries.

For instance, Morocco is in the process of implementing an Extended Producer Responsibility (EPR) system for Polyethylene terephthalate (PET) bottles widely used for beverage packaging[429] and has prohibited plastic bags.[430]

Tunisia have established EPR principles in various waste management laws and decrees, with a focus on packaging waste management and sanitary landfills to be built upon in future.[431]

Egypt is also in the process of developing implementation plans for EPR principles.[432]

These developments are chiefly being supported by the UfM-labelled TouMaLi project.

In parallel to prevention measures, the effective management, minimisation, and remediation of marine pollution requires increased cooperation and coordination among different levels of governance and multiple types of stakeholders.

The role of local coastal cities and municipalities has been widely acknowledged in this regard, as they are often entrusted with the implementation of relevant policies in the areas of waste management and treatment activities, tourism, etc.[433]

Moreover, local authorities play a key role in the management of Marine Protected Areas (MPAs), a fundamental tool in the fight against marine pollution. In the framework of Interreg MED Biodiversity Protection Community,[434] initiatives and tools such as ACT4LITTER Marine Litter Watch Month have provided guidance to MPA managers in dealing with this issue.

The availability of adequate port reception facilities (PRFs) for ships' waste (including cargo residues, garbage, oily water, and sewage) is crucial for the effective implementation of waste management plans in ports.[435]

In the EU, the availability of PRFs in ports is the responsibility of Member States under the Port Reception Facilities Directive and such facilities are paid partly by the ships and partly by the port authorities.

424 The Pew Charitable Trusts (2020) Breaking the plastic wave
425 Ellen MacArthur Foundation
426 IRP (2021) Policy options to eliminate additional marine plastic litter by 2050 under the G20 Osaka Blue Ocean Vision
427 More information at: https://www.unep.org/unepmap/news/story/three-facts-about-mediterranean-experience-tackling-plastic-pollution
428 More information at: https://www.medwaves-centre.org/what-we-do/the-switchers-support-programme/
429 More information at: https://www.unep.org/unepmap/news/story/three-facts-about-mediterranean-experience-tackling-plastic-pollution
430 More information at: https://toumali.org/system/files/document/policy-factsheet-morocco-2.pdf
431 More information at: https://toumali.org/system/files/document/policy-factsheet-tunisia.pdf
432 More information at: https://toumali.org/system/files/document/policy-factsheet-egypt-3.pdf
433 Ziveri, P., Grelaud, M. and Pato, J. (2023) Actions of cities and regions in the Mediterranean Sea area to fight sea pollution
434 Interreg MED (2019) Mediterranean Biodiversity Protection tools catalogue
435 More information at: https://emsa.europa.eu/sustainable-ports/port-reception-facilities.html

At Mediterranean level, MARPOL signatory parties are required to ensure the provision of adequate PRFs, and the Port Reception Facility Database (PRFD), a module of the IMO Global Integrated Shipping Information System (GISIS), provides data on facilities for the reception of all categories of ship-generated waste.

Monitoring and citizen science activities such as the Program for the Assessment and Control Pollution in the Mediterranean (MEDPOL)[436] or the MedBioLitter[437] open database provide the means to gather data on the presence, extent, and impacts of pollutants in the marine environment, and therefore allow for evidence-based, targeted policy making.

Although marine litter data is becoming increasingly available (including via the MEDiterranean International Trawl Surveys (MEDITS),[438] EMODnet,[439] and the Copernicus Marine Service[440]), due to the technical difficulties involved in marine litter observation, knowledge gaps and uncertainties that need to be underpinned by research persist.

Measurement campaigns are usually restricted to areas close to the coast, and are not carried out systematically, but rather during periods with favourable weather conditions for navigation.

Moreover, observational strategies are carried out by different teams using different indicators and techniques, so results are not always comparable.[441]

For these reasons, numerical modelling and machine learning techniques emerge as fundamental tools for obtaining an accurate description of marine litter patterns and as the basis for developing forecasting systems to inform evidence-based policymaking.[442]

Lastly, awareness raising campaigns and educational activities (i.e. ocean literacy initiatives particularly targeted to youth) can contribute to changing the attitudes and behaviour of citizens while inspiring people to become actively involved in protecting the sea.

Table 18 Projects and Initiatives related to Interactions between Marine Litter and the Blue Economy

Project	Description	Funding Source	Period
ACT4LITTER	MPA management, action plans and governance. Synthesis of measures to tackle and combat litter pollution, including beach monitoring.	Interreg MED	2017-2018
AMARE	Novel approached to monitoring Marine Litter providing georeferenced information on distribution and amounts in MPAs.	Interreg MED	2016-2019
MEDSEALITTER	Combined monitoring and assessment protocols for marine litter quantities and biodiversity interactions in the sea.	Interreg MED	2016-2019
PANACeA	Synthesis and capitalization of current research, management and policy efforts and tools to tackle marine litter in the Mediterranean.	Interreg MED	2017-2019
PHAROS4MPAs	Synthesis of drivers, activities and pressures in the marine environment related to pollution among others.	Interreg MED	2017-2020
SeaClear 2.0	SeaClear 2.0 will develop an integrated approach to address the entire life cycle of marine litter, focusing on reducing marine litter pollution. It will especially target plastic pollution and will use teams of robots to monitor and collect marine seafloor and surface litter.	HORIZON-IA - HORIZON Innovation Actions	2023-2026

436 More information at: https://www.unep.org/unepmap/who-we-are/institutional-set/med-pol
437 More information at: https://www.etc.uma.es/medbiolitter-an-open-database-on-marine-litter-and-biodiversity-science/
438 More information at: https://www.sibm.it/SITO%20MEDITS/principaleprogramme.html
439 More information at: https://emodnet.ec.europa.eu/en/marine-litter
440 More information at: https://marine.copernicus.eu/
441 Soto-Navarro J. (2020) 3D hotspots of marine litter in the Mediterranean: A modelling study
442 Jordà, G. and Soto-Navarro, J (2023) An analogues-based forecasting system for Mediterranean marine-litter concentration, Ocean Sci., 19, 485-498

Project	Description	Funding Source	Period
REMEDIES	REMEDIES aims to create innovative solutions and technologies to monitor, collect, prevent, and valorise microplastics from the oceans. It aims to do so through the detection, collection, monitoring, valorisation, and prevention of plastics and zero waste solutions.	HORIZON-IA- HORIZON Innovation Actions	2022-2026
Marine Litter Med II Project	Reduce and prevent the generation of marine litter in the Mediterranean through an expanded implementation of key reduction and prevention measures as provided for in the updated Regional Plan on Marine Litter Management in the Mediterranean. The project builds on the outcomes of the EU-funded Marine Litter MED project (2016-2019).	EC-DG-ENV	2020-2023
MED-In-A	A Mediterannean Integrated Alliance on Waste for cities and citizens proposes to develop and roll out a methodology for a "Zero Waste" public policy to transform municipalities waste management practices from "treating always more waste" to "treating less by preventing waste" through a focus on citizen behaviour change and civic engagement.	ENI CBC MED	2019-2023
PLASTIC BUSTERS' INITIATIVE	The Plastic Busters Initiative aims to provide a concrete opportunity to like-minded projects addressing the whole management cycle of marine litter to get together and fully explore the potential for synergies towards ensuring aligned and synchronized marine litter activities across the Mediterranean, all contributing to a shared common objective: to effectively tackle the issue of marine litter in the Mediterranean. It includes projects such as COMMON, PlasticBusters CAP & PlasticBusters MPA, Emme, AdriCleanFish and LifeMuscles.	Various	2013 - ongoing
Operation Clean Sweep	Operation Clean Sweep is a free voluntary programme aimed at improving awareness, promoting best practices, and providing guidance and tools to support companies from the plastics value chain in the implementation of the necessary pellet loss prevention measures.		Ongoing

EMPLOYMENT

As a cross-cutting theme which relates to each maritime sector, addressing marine litter will be focused on and organised around the idea of circularity and circular economy principles, which will become mainstream.

Rather than creating entirely new employment opportunities and sectors, marine conservation and management roles may be expanded, and circularity principles integrated into existing roles.

The eco-tourism and sustainable tourism sector may also be expanded which could lead to job development in this area and presents an employment opportunity particularly for locals in coastal areas.

Employment opportunities may also be increased when it comes to dedicated sustainability roles within existing maritime industries and companies, such as in the shipping or fishing industries.

There is potential for an increase in a variety of jobs relating to the waste life cycle including sustainable product and packaging design, production, waste management and prevention, which is particularly pertinent for tackling marine litter.

As such, there may be an increased demand for consultants and policy advisors. Technology and innovation driven employment may also play a role, with increased opportunities for start-ups to introduce innovative ideas to tackle the issue of marine litter.

The most significant employment opportunity, in line with the identified gap in data and research when it comes to marine litter, will relate to the increased roles relating to scientific research including data collection, monitoring and assessment.

This will play a significant role in bridging the endemic knowledge gaps relating to marine litter.

There exists an opportunity to further empower women in coastal communities who are often excluded. Increased youth involvement can also be a fruitful avenue for change, via avenues such as increased internship opportunities and volunteer programs as well as education, training and awareness relating to marine litter.

Table 19 Skills needed to address the challenge of marine litter

Hard skills	Soft skills
• Scientific research, data analysis, monitoring, and assessment • Waste management • Knowledge and proficiency in circular economy principles • Business management (knowledge and development of cost-effective strategies, market-based approaches) • Innovation and entrepreneurship • Technology • Knowledge of policies relating to circular economy, sustainability and marine litter, international frameworks, regulations, policy, governance, and ability to apply them • Product and packaging design	• Creative thinking and innovation • Critical thinking • Decision-making • Problem-solving • Foresight • Good communication competences • Multidisciplinary approach • Collaboration competences • Flexibility and adaptability • Team management • Leadership and responsibility • Negotiation skills • Environmental awareness • Community engagement

Table 20 Examples of what jobs I can expect / Job range

On land / office work	Offshore and coastal work
• Marine litter waste management consultant • Port litter management coordinator • Data Analyst • Researcher • Policy analyst • Marine litter project manager • Environmental educator • Monitoring specialist • Outreach coordinator • Shipping industry environmental compliance officer, sustainability manager • Marine litter response coordinator • Entrepreneur	• Coastal cleanup coordinator • Cleanup diver • Fishing gear retrieval technician • Vessel litter management coordinator

MARINE RESEARCH & INNOVATION

INTRODUCTION

Research and innovation (R&I) offer significant opportunities for Mediterranean countries to develop and use their assets to the benefit of their economies and of their citizens, especially as a driver of economic development.[443]

In light of current challenges such as climate change, overexploitation of fish stocks or diverse forms of pollution affecting the Mediterranean, research and innovation can play a crucial role in adequately measuring and addressing such challenges, as well as in accelerating and further developing Mediterranean value chains.

The 2021 UfM Ministerial Declaration on Sustainable Blue Economy[444] recognized Marine Research and Innovation as a cross-cutting tool which acts as an enabler for the sustainable transformation of blue economy sectors.

Among other elements, the Declaration emphasised a concern for the disparities existing in research and innovation and their potential impact on the sustainable development of blue economy in the region; as well as the lack of systematic data relating to the impact of climate change on oceans.

As such, Ministers reaffirmed the need to invest in socio-economic observatories in the region; to pool research and innovation investments at all levels, and the importance of working closely with the private sector to promote innovation.

More recently in Athens, one of the central themes raised by Mediterranean stakeholders[445] was the role of innovative technologies as essential tools for advancing sustainable practices in the Blue Economy.

Discussions centred on the role of technology in (i.e.) monitoring and managing marine ecosystems, promoting efficient fisheries, and developing clean energy solutions.

Stakeholders also emphasized the importance of capacity building and education; of balancing economic interests with environmental sustainability; and of inclusivity and cross-sectoral cooperation, encouraging partnerships between academia, industry, government, and civil society. Such collaboration was deemed essential for creating comprehensive solutions balancing economic development with environmental conservation.

443 UFM (2023) Roadmap to set the path towards the implementation of the 2021 UFM ministerial declaration on sustainable blue economy
444 Union for the Mediterranean (2021) Ministerial Declaration on Sustainable Blue Economy
445 UfM (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages

OVERVIEW

Research & Innovation cooperation

The Mediterranean region has streamlined efforts in recent years in promoting scientific cooperation, including through the creation of transnational initiatives aimed at strengthening and aligning research and innovation infrastructures and capacities; as well as by promoting scientific cooperation and the development of national science & technology Roadmaps in the framework of the UfM.

Mediterranean-wide R&I initiatives in the blue economy

Regarding R&I initiatives specifically targeted at the sustainable development of the blue economy, the **BLUEMED Initiative**[446] and its **related Strategic Research and Innovation Agenda (SRIA)**[447] -adopted by all UfM countries- constituted the first structuring and integrative element for the integration of knowledge and research and innovation priorities in the Mediterranean in the blue economy sectors.

The BLUEMED SRIA, last updated in 2018, identified a set of challenges under three pillars, (i) 'key enabling knowledge', (ii) 'key sectoral enablers', and (iii) 'enabling technology and capacity creation' characterized by tight horizontal synergies deemed necessary for sketching economy-driven trajectories.

In this context, 16 Mediterranean countries joined forces under a dedicated Pilot for a healthy, plastic-free Mediterranean Sea to tackle marine litter and set up national hubs to tackle plastic pollution.

The year 2023 marked a new milestone in terms of Research & Innovation cooperation in the Mediterranean by the establishment of the Mediterranean Lighthouse (LH) of the Mission to Restore our Oceans and Waters (operationally supported by the Horizon Europe Coordination Support Action "BlueMissionMED"),[448] closely aligned thematically with the above-mentioned Pilot.

The Mediterranean Lighthouse is set to pilot and lead on Mission Objective 2 - Prevent and eliminate pollution, providing access to the solutions, services and advice to all interested actors, so that the developed solutions can be scaled up and replicated. In this context, several Innovation Actions (IAs) are ongoing in the Mediterranean to develop innovative solutions to tackle this objective.

Figure 23 Mission to Restore our Oceans and Waters by 2030 Intervention Logic

Source: Mission Implementation Plan (2023)

446 More information at: http://www.bluemed-initiative.eu/
447 BlueMED (2018) Strategic Research and Innovation Agenda
448 More information at: https://bluemissionmed.eu/

CROSS-CUTTING THEMES

Other related blue economy R&I initiatives in the Mediterranean promoted at EU level include the Sustainable Blue Economy Partnership (SBEP), bringing together 60 Partner institutions from 25 countries and the European Commission to pool research and innovation investments and align national programmes across different blue economy-related priorities; as well as the Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans), which provides a strategic agenda and action plan to address complex ocean-related societal challenges that cannot be solved at national level.

While not directly focused on -but closely linked to- the blue economy, the Partnership for Research and Innovation in the Mediterranean Area (PRIMA)[449] should also be mentioned as a fundamental tool to build research and innovation capacities and develop knowledge and common innovative solutions among EU and Mediterranean partner countries.

As a pioneering effort, it was built on an equal footing basis (co-ownership, co-management and co-funding), with the participation of the European Commission to align R&I policies and investments at regional level.

Its thematic focus is on jointly tackling environmental and social changes brought about by climate change, such as depletion of agro-food systems and water resources. PRIMA has recently amended its basic act to continue working towards its goals and extended its for three more years (2025-2027).

Support to scientific cooperation in the context of the UfM

The role of UfM has been crucial in promoting scientific cooperation and exchange amongst its member countries. The first Union for the Mediterranean Ministerial Conference on Research and Innovation and its related Declaration[450] was adopted on 27 June 2022, following the Valletta Declaration of 2017 on strengthening MEDiterranean collaboration through Research and Innovation.

At the operational level, the UfM Regional Platform in Research and Innovation actively supports the implementation of the Ministerial and plays a central role in stimulating and monitoring MEDiterranean cooperation in the fields of research and innovation.

In particular, the UfM Platform has focused on developing and facilitating the implementation of a set of Roadmaps/ Theories of Change and Impact Pathways (TCIPs)[451] addressing key challenges and opportunities in each of the three critical thematic areas: Health, Renewable Energies and Climate Change.

Box 6 Fostering Science Diplomacy in the Mediterranean Region

Science diplomacy constitutes an essential tool for cooperation and integration of Research and Innovation policies between Southern and Eastern Mediterranean countries and Europe. The UfM plays an indispensable role as a dialogue forum for its 43 Member States and has been horizontally supporting science diplomacy since its creation through its different strands of sectorial cooperation on research and innovation.

On 3 October 2023 in Barcelona, the UfM organised a dedicated MEDiterranean Conference on Science Diplomacy,[452] with the aim of highlighting the state-of-art, challenges and opportunities, and discuss the way forward as a community of practice. As an outcome of the conference, participants called on international organizations, Member States, networks and expert groups to deploy science diplomacy more structurally and strategically as a lever for building bridges across our societies, emphasising the need for an anticipatory dimension and a policy-oriented approach to leverage the potential of science for identifying peaceful ways to jointly tackle common challenges. Likewise, the importance of providing monitoring mechanisms to identify and measure specific impacts of implemented science diplomacy actions was raised.[453]

449 More information at: https://research-and-innovation.ec.europa.eu/research-area/environment/prima_en
450 Union for the Mediterranean (2022) First Union for the Mediterranean Ministerial Conference on Research and Innovation
451 Union for the Mediterranean (2021) Theories of Change and Impact Pathways
452 More information at: https://ufmsecretariat.org/science-diplomacy-cairo2024/
453 More information at: https://ufmsecretariat.org/wp-content/uploads/2023/10/Outcome-Euro-Med-Conference-on-Science-Diplomacy-3-October-2023.pdf

Concerning specifically scientific cooperation in the field of blue economy, the UfM also promotes science diplomacy through the Regional Platform on Sustainable Blue Economy,[454] which provides a forum for exchange of information, best practices, and know-how among countries, experts, and stakeholders (See Chapter on Governance for additional details).

15th Meeting of the UfM Sustainable Blue Economy Regional Platform, held on 27 June 2024 | Source: UfM, 2024

The Mediterranean Blue Economy Stakeholder Platform (MedBESP)[455] serves as a "hub", including among others a document repository, training materials, and an interactive database of research centres and universities conducting research activities and facilitating the most current academic programs and training curricula on blue economy in Europe and the Mediterranean region.

Indeed, MedBESP is the regional networking platform for (i) sharing knowledge and supporting the development of the SBE in the Mediterranean, and (ii) contributing to the development of the Mediterranean Blue Economy Community.

UfM MED Blue Economy Stakeholder Platform | Source: UfM (2024)

It is funded by the EU and overall managed by the Union for the Mediterranean (UfM).

As an interactive, user friendly, and community-based stakeholder platform, the platform enables registered users to keep track of the latest news and events in the region; share their work and initiatives in order to disseminate and widen the reach of their activities; extend their network; and build new operational partnerships.

The UfM and the European Commission also announced in April 2024 the launch of the MEDiterranean Hub for Research and Innovation (R&I).[456]

The Hub serves as a repository consolidating a wealth of resources including research findings, best practices, project results, policy papers, and other publications. Moreover, it offers a comprehensive array of opportunities for R&I collaboration, ranging from funding opportunities to initiatives supporting cooperative Mediterranean R&I infrastructures, such as networks and cluster organisations.

The role of Maritime Clusters

There is increasing evidence that innovation occurs or is enhanced through interactions among groups of stakeholders.[457]

Thus, to support the entrepreneurial ecosystem, the need to promote the establishment of structures which enable such interactions is being increasingly acknowledged.

The role of maritime clusters in boosting innovation and was in fact highlighted by the UfM 2021 Ministerial Declaration as essential actors in aggregating local SMEs and large companies across a range of sectors in the blue economy.

454 More information at: https://medblueconomyplatform.org/union-for-the-mediterranean-regional-platform-on-sustainable-blue-economy-sbe/
455 More information at: https://medblueconomyplatform.org/
456 More information at: https://ufmsecretariat.org/catalyzing-innovation-euro-med-hub-research-innovation/
457 World Bank (2020) A Practitioner's Guide to Innovation Policy

Clusters can indeed promote synergies with enterprises involved in in-land activities across complex value chains. In the Mediterranean context, they are considered key "brokers" between EU regions and neighbouring countries.[458-459]

The maritime cluster phenomenon is expanding in the Mediterranean region, as shown by their proliferation outside the EU, including in Southern and Eastern Mediterranean countries.

The Med Maritime Clusters Alliance under the WestMED initiative is a maritime cluster which promotes sustainable blue economy growth in the Mediterranean through enhanced cooperation, innovation, and sustainable practices among maritime clusters.

It aims to boost economic development, job creation and global competitiveness while supporting environmental sustainability and harmonizing policies across the region.[460]

In Table 21 below, an overview of the additional main maritime clusters operating in the region is provided.

Table 21 Overview of Maritime Clusters in the Mediterranean (per country)

Mediterranean country	Maritime clusters
Italy	ForMare - Polo Nazionale per lo Shipping Cluster BIG - Blue Italian Growth Federazione del Mare Cluster Transporti Mare FVG
Greece	Strategis Maritime ICT Cluster Maritime Hellas
Portugal	Fórum Oceano
Spain	Clúster Marítimo Español (CME) Clúster Marítimo-Marino de Andalucía (CMMA) Clúster Marítimo y Logístico de las Illes Balears Cluster Marino Marítimo de Canarias Clúster Marítimo Naval Cádiz
Tunisia	Cluster Maritime Tunis
France	Pôle Mer Méditerranée Cluster Maritime Français
Algeria	SARL Leanovator
Morocco	In progress[461]
Mauritania	In progress[462]

458 More information at: https://westmed-initiative.ec.europa.eu/westmed-maritime-clusters-alliance/

459 Union for the Mediterranean (2019) Maritime Clusters in the Mediterranean Region Overview of existing types and practices, and analysis of their potential to boost sustainable growth and jobs in the Mediterranean sea basin

460 More information at: https://westmed-initiative.ec.europa.eu/westmed-maritime-clusters-alliance/

461 In the framework of the first High-level national dialogue on "The challenges of integrated governance and the roadmap for implementing blue economy in Morocco" in Rabat, June 5, 2024, the deployment of two pilot maritime clusters in the regions of Tanger-Tétouan-Al Hoceima and Souss-Massa was announced. More information available at: https://westmed-initiative.ec.europa.eu/national-stakeholder-dialogue-in-morocco-paves-the-way-towards-a-national-sustainable-blue-economy-strategy/

462 The WestMED Maritime Cluster Alliance has been providing support to the establishment of a Mauritanian Maritime Cluster. More information available at: https://westmed-initiative.ec.europa.eu/the-westmed-maritime-cluster-alliance-helps-pave-the-way-for-establishing-a-mauritanian-maritime-cluster/

Mediterranean country	Maritime clusters
Libya	In progress[463]
Israel	Israeli National Center of the Blue Economy Innovation Centre Eilat-Eilot (in progress)[464]
Croatia	Croatian Maritime Industry Competitiveness Cluster
Bulgaria	Marine Cluster Bulgaria
Malta	Malta Marittima Malta Maritime Forum
Cyprus	Maritime Cyprus

Emerging Blue Biotechnology and Bioeconomy

The OECD defines blue biotechnology as the application of science and technology to living aquatic organisms for the production of knowledge, goods and services.[465]

In addition, the blue bioeconomy incorporates any economic activity associated with the use of renewable aquatic biological resources to make products.[466]

Examples of these wide-ranging products include novel foods and food additives, animal feeds, nutraceuticals, pharmaceuticals, cosmetics, materials (e.g. clothes and construction materials) and energy.

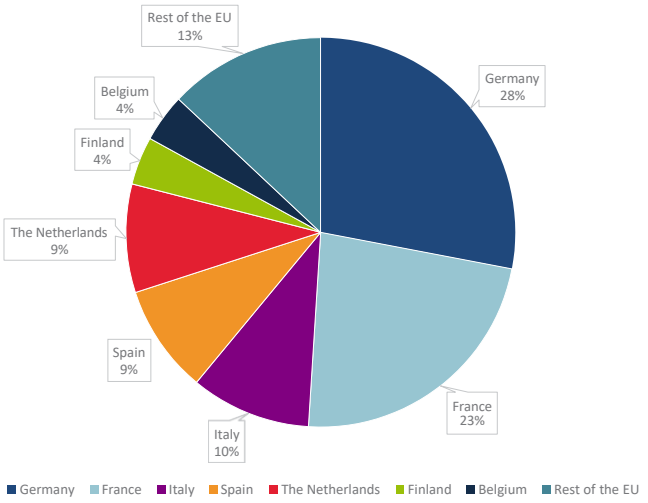
In Europe, these activities have been growing fast although unevenly.

Although current statistics classifications in the EU do not consider a specific code for "blue biotechnology", which means there are no official data on the turnover, value added, and employment of the sector; estimates show that the total EU blue biotechnology market is valued at €868 million in 2021 and is projected to grow to €1 786 million in 2032.[467]

In addition, 163 European blue biotechnology start-ups and scale-ups are registered in Hub Azul -an online innovation platform set up by the Portuguese Maritime Cluster Fórum Oceano-, with an overall economic value in 2023 of about €1.1 billion.[468]

As shown by Figure 24 below, three Mediterranean countries - France (23%), Italy (10%) and Spain (9%) - are leading the way in terms of value creation in the blue biotechnology.

Figure 24 Blue biotechnology market value by EU Member State, 2021



Source: Source: EU blue economy report 2024

463 The development of a Maritime Cluster in Libya was foreseen in the 2022 Malta Roadmap for the creation of Maritime Clusters, and discussions around it have been held in the context of the development of a Sustainable Blue Economy Strategy for Libya. More information at: https://westmed-initiative.ec.europa.eu/events/westmed-national-event-developing-a-sustainable-blue-economy-strategy-for-libya-30-november-2023-tripoli-libya/

464 More information at: https://www.zenger.news/2024/01/15/israel-to-establish-nine-regional-innovation-hubs-to-foster-entrepreneurship/

465 OECD (2017) Marine Biotechnology: Definitions, Infrastructures and Directions for Innovation

466 European Union (2023) Blue Bioeconomy Report

467 European Union (2024) The EU Blue Economy Report 2024

468 More information at: https://hubazul.pt/en/landing-page-en

The most notable sub-sector in blue bioeconomy is the algae sector.[469]

Algae are being used to develop new pharmaceuticals, food, animal feed, cosmetics, or bio-packaging, among others. Its cultivation can also provide ecosystemic services such as carbon sequestration, removal of nutrients, habitat restoration, etc.

To date, micro- and macroalgae cultivation systems in the EU, including seaweed farming, remain very small-scale, with start-ups being developed although not yet commercially operational.[470]

As key barriers hindering the further development of the sector, the EU Blue Bioeconomy report highlights a fragmented and complex regulatory landscape to obtain licences and permits, with multiple and not clearly identified players, as well as costly procedures for small companies.[471]

Moreover, a recent study showed that the blue biotechnology innovation potential has not been exploited in the Mediterranean as well as in other EU regions so far due to a lack of a clear identification of the different value chains and the high fragmentation of business innovation initiatives.[472]

It therefore proposes three value chains with higher potentials for the Northern Mediterranean region, including algae production for added-value compounds, integrated multi-trophic aquaculture (IMTA) and valorisation aquaculture/ fisheries/ processing by-products, unavoidable/ unwanted catches and discards.[473]

To contribute to ensuring a level playing field in the blue bioeconomy, the European Commission launched the Blue bioeconomy forum[474] and the EU Algae initiative,[475] which provide stakeholders with knowledge and tools, as well as a platform for co-creation.

Moreover, quite recently a Smart Specialisation Thematic Partnership was created with a focus in the Mediterranean region to support the development of the sector, as detailed in the box 7.

Box 7 S3 Partnership on Maritime Sustainable Blue Bioeconomy (MaSBBE)

Capitalising and expanding on the outcomes of key Interreg MED 2014-2020 projects related to the Blue Bioeconomy in the MEDiterranean region (i.e. MISTRAL,[476] B-Blue,[477] and BLUE BIO MED[478]); a new thematic partnership on Maritime Sustainable Blue Bioeconomy (MaSBBE)[479] under the Smart Specialisation Strategies (S3) Community of Practice was launched in November 2023.

The partnership is formed by 50 public and private stakeholders in the Mediterranean, led by the Italian regions of Emilia Romagna and Apuglia. Participating regions include Crete (EL), Attica, (EL), Slovenia (SI), Balearic Islands (ES), Catalonia (ES), Andalucia (ES), Lazio (IT), Campania (IT), Alentejo (PT), and Norte (PT), Adriatic Croatia (HR), Albania (AL), Kosovo (XK), Skopsi (MK), and Cyprus (CY).

The mission of the partnership is to gather and share knowledge with a quadruple helix approach to find new sustainable ways to produce food, energy, and reduce waste in both land and sea. Its thematic working areas addressed include i) Marine biotic resources; ii) Marine environment and biodiversity conservation; iii) Blue Biotechnologies; and iv) Digitalisation of the Blue Bioeconomy. As key services, the partnership offers its members governance support; funding, finance and investments assistance; and promotes scale-up and commercialisation of solutions.

Other S3 thematic partnerships related to the blue economy include the Circular Smart Aquaculture partnership, and ADMA energy (with a focus on marine renewables).

469 European Union (2022) The EU Blue Economy Report 2022
470 European Union (2023) Blue Bioeconomy Report
471 Ibid
472 Rotter, A. et al (2023) Identification of Marine Biotechnology Value Chains with High Potential in the Northern Mediterranean Region
473 Ibid
474 More information at: https://maritime-forum.ec.europa.eu/theme/blue-economy-and-fisheries/blue-economy/blue-bioeconomy-forum_en
475 More information at: https://maritime-forum.ec.europa.eu/theme/blue-economy-and-fisheries/blue-economy/eu4algae_en
476 More information at: htttps://mistral.interreg-med.eu/
477 More information at: https://b-blue.interreg-med.eu/
478 More information at: https://blue-bio-med.interreg-med.eu/
479 More information at: https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/partnership_sustainable_blue_bioeconomy_en

Marine observation, data and knowledge

In 2021, UfM Ministers highlighted the need to invest in socioeconomic observatories and provide scientific evidence to support integrated approaches to the development of the sustainable blue economy.[480]

Similarly, the article 16 of the ICZM Protocol of the Barcelona Convention acknowledges that monitoring and observation mechanisms and networks are crucial for the preservation of the Mediterranean Sea and its coasts.[481]

In line with these goals, a proposal for a Mediterranean conceptual framework for coastal observation[482] was published by Plan Bleu in 2024, including a core set of indicators to monitor the coastal zones, as well as a general performance review of some observatories in the Mediterranean region.

The report showed that there is a need to increase capacity at national level to collect, gather, and analyse data; particularly by clearly defining and connecting responsible entity(/ies) in charge of reporting and sharing observation results and by harmonizing parameters and procedures across different levels of reporting involved (national, sub-national, and local).

Plan Bleu also holds the Mediterranean Observatory on Environment and Sustainable Development,[483] which provides the Contracting Parties of the Barcelona Convention with environmental and sustainable development statistics, indicators and assessments.

At EU level, the Copernicus Marine Service and the European Marine Observation and Data network (EMODnet) provide free, open, regular and systematic baseline information on the state, variability and dynamics of European ocean and seas.

By structuring input from these databases and further expanding on these sources by incorporating socio-economic aspects, the EU Blue Economy Observatory[484] was made publicly available in May 2022, as well as the more recent launch of the Digital Twin of the Ocean[485] in June 2024, are substantially contributing to the structuring of ocean observation and monitoring capacities.

Box 8 S3 Partnership on Maritime Sustainable Blue Bioeconomy (MaSBBE)

The Digital Twin of the Ocean, announced by the European Commission in 2022, is a digital space which will provide access to data, models, artificial intelligence, and other tools to allow for the replication of properties and behaviours of marine systems, including ocean currents, waves, marine life, human activities, and their interactions, in and near the sea.

The aim is to bridge knowledge gaps and enable scientists, marine experts, olicy makers, citizens and entrepreneurs to test different specific scenarios using data and modeling through tailor-made applications. In doing so, new ways to restore marine and ocean habitats, support a sustaianble blue economy and mitigate and adapt to climate change can be designed.

The Digital Twin of the Ocean is a main element of the Digital Ocean Knowledge System under the EU Mission Restore Our Oceans and Waters. It will be updated following its launch in June 2023,

480 UfM (2021) Ministerial Declaration on Sustainable Blue Economy
481 More information at: https://www.unep.org/unepmap/who-we-are/contracting-parties/iczm-protocol
482 Plan Bleu (2024) Proposal of Mediterranean conceptual framework for coastal observation
483 More information at: https://www.obs.planbleu.org/en/
484 More information at: https://blue-economy-observatory.ec.europa.eu/index_en?prefLang=es
485 More information at: https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters/european-digital-twin-ocean-european-dto_en

It should be noted that, as an unprecedented regional endeavour to better understand the risks associated to climate and environmental change in the Mediterranean region, the Mediterranean Experts on Climate and Environmental Change (MedECC) developed the first Mediterranean Assessment Report (MAR1)[486] in 2020 with contributions from almost 190 scientists from 25 countries. An updated version of the report is expected to be developed between 2024-2026.[487]

Innovation ecosystems and entrepreneurship

UfM Member countries emphasized the role that innovation can have to provide tailor-made solutions for societal challenges in the Mediterranean region and to create new and sustainable business opportunities in the blue economy.[488]

Indeed, innovation has become a core aspect of sustainable development in the context of the 2030 Agenda's Goal 9 alongside infrastructure and industrialization.[489]

A recent report[490] has explored the main obstacles and challenges to the creation and development of innovation strategies, ecosystems, start-ups, and solutions in the Mediterranean.

Among the top challenges for entrepreneurs in the region, the report highlights the lack of access to finance (equity, loans, investment) and engagement of the private sector. This is linked to a general lack of favourable legislation, and high entry barriers, as well as to a lack of efficient and effective coordination between different actors in the innovation ecosystem.

Building on the conclusions of this report, ARLEM (the MEDiterranean Regional and Local Assembly) proposed concrete solutions and highlighted on-going good practices[491] such as the HOMER project, which brings together chambers of commerce, business associations, higher education institutions and associations of limited liability entrepreneurs in the Mediterranean region to help high-performing students find jobs in their home countries; the planned creation of Smart Cities Innovation Centres in Fez (Morocco) and Tunis (Tunisia) and the Business and Innovation Centres (BIC) being created to support and boost innovation in several regions such as Málaga (Spain).

486 More information at: https://www.medecc.org/medecc-reports/climate-and-environmental-change-in-the-mediterranean-basin-current-situation-and-risks-for-the-future-1st-mediterranean-assessment-report/
487 More information at: https://es.openprocurements.com/tender/support-to-medecc-2024-2026-fzg/
488 UfM (2021) Ministerial Declaration on Sustainable Blue Economy
489 More information at: https://www.un.org/sustainabledevelopment/es/infrastructure/
490 European Union (2021) Innovation ecosystems and start-ups in the Mediterranean as a means of recovering from the COVID-19 crisis
491 Ibid

FUTURE (2025-2030)

Further integration of R&I infrastructures: Research infrastructures (hard and soft infrastructures) have been defined as institutional lighthouses that bring scientists together across borders, ensuring excellence and bringing together North and South, while benefitting local communities.[492]

Their integration was identified as a crucial factor in addressing complex challenges such as climate change, biodiversity loss, and sustainable resource management in the context of the 2nd UfM stakeholders conference on sustainable blue economy.

The further integration of such infrastructures will largely rely on strengthening financial support and encouraging collaborations between public institutions and private companies.

Directing investment towards blue biotechnology innovations: Blue biotechnology companies are often too capital-intensive – due to the high costs of research & development – for venture capitalists and too risky for equity financing.[493]

In this sense, initiatives such as BlueInvest and European Investment Bank loans -discussed in the dedicated chapter on Sustainable Finance- are of special significance, as they contribute to lower the risk profile of innovative companies.[494]

As acknowledged by the UfM and the European Commission, Smart Specialisation Strategies (S3) can serve as a fundamental mechanism to direct investment towards research, development, and innovation to drive the Sustainable Blue Economy approach.

Facilitation of market access for MSMEs and start-ups: This may include the simplification of procedures required to create, run, and close a business, reducing bureaucratic hurdles and administrative costs, particularly in Southern Mediterranean countries.

For instance, streamlined registration processes and online platforms for business applications can significantly cut down the time and effort needed to start a business. Additionally, implementing MSME- and start-up-friendly public procurement policies would provide them with opportunities for growth and stability. Furthermore, offering training and support programs to help these businesses understand and navigate the procurement process can enhance their chances of success.

Access to international markets can also be facilitated through export assistance programs and partnerships with global trade organizations, enabling MSMEs and start-ups to expand their reach and increase competitiveness. Creating supportive financial environments, such as offering grants, low-interest loans, and other financial incentives, can further bolster their market presence and long-term viability.

Further supporting the establishment of maritime clusters, accelerators and incubators in the Mediterranean as drivers for innovation: progress in this area has been achieved particularly in the context of the WestMED initiative and its related "Maritime Clusters Alliance."

In this regard, the project CALLMEBLUE – Cluster ALLiance MEd BLUE,[495] supported by the European Maritime Fisheries and Aquaculture Fund (EMFAF) aims to strengthen existing clusters alliances in the Mediterranean area in order to accelerate north-south regional cooperation processes towards the emerging of strategic maritime clusters in the North African area.

Efforts should continue to be streamlined along these lines, with a view to achieving the goals set out in the Malta Roadmap adopted in 2022.

492 More information at: https://ufmsecretariat.org/science-diplomacy-cairo2024/
493 European Commission (2024) The EU Blue Economy Report. 2024
494 Ibid
495 More information at: https://callme-blue.eu/about-project

MARITIME SKILLS, CAREERS AND EMPLOYMEMT

INTRODUCTION

A competitive, resilient, and socially fair blue economy needs highly qualified and skilled professionals.

2023 was the European Years of Skills[496] and blue skills have emerged as a prominent topic for policy support and sectoral needs across emerging and mature blue economy sectors.

The landscape of blue economy professions in the Mediterranean is undergoing rapid transformation, fuelled by technological advancements, demographic shifts, evolving greener business models, and the ongoing digital revolution.

Consequently, the skill sets required to excel in marine-related activities and navigate career paths are constantly evolving in response to these changes.

Under the 2021 UfM Ministerial Declaration on Sustainable Blue Economy, the countries highlighted the need to prioritize education, vocational training and scientific capacity including technology transfer to anticipate transformative technological trends and promote just transitions.[497]

Several sectors of the blue economy have emerged as a new and promising sector for tackling unemployment in the Mediterranean, especially for youth. Aquaculture, fisheries and coastal tourism are the sectors with higher rates of created employment. However, the most promising sectors to enable new job opportunities are blue biotechnology, marine renewable energy and sustainable coastal eco-tourism, among others.

The traditional sectors such as maritime transport and ports also offers a potential of jobs creation, as the industry works towards decarbonisation and digitalisation.

Recently, in the framework of the 2024 UfM Stakeholder Conference on SBE, Mediterranean stakeholders have identified the key needs and challenges related to blue skills and employment.

There is a shortage of adequate skills to meet the demand in emerging sectors such as offshore renewable energy, blue biotech and algae production, among others. This involves addressing the skills gap through demand-driven approaches, lifelong learning, and technical and vocational training (TVET).

Additionally, efforts aim to tackle brain drain, increase private sector engagement, improve communication between stakeholders, and enhance the perception of careers in marine sectors, particularly among youth and women.

The importance of education for sustainable development and ocean literacy is also emphasized.[498]

496 More information at: https://maritime-forum.ec.europa.eu/theme/ocean-literacy-and-blue-skills/blue-skills_en
497 UfM (2021) Ministerial Declaration on Sustainable Blue Economy
498 UfM (2024) 2nd UfM Stakeholder Conference on Sustainable Blue Economy. Outcomes and main messages

OVERVIEW

In Mediterranean countries, 22.5 million people were unemployed in 2018, more than 11% of the total labour force. Unemployment rates vary from 4% in Malta to 26% in Palestine.

The number of unemployed people has reached up to 3 million in Egypt, Türkiye and Spain. Additionally, youth unemployment is a major issue in all Mediterranean countries, including high rated of youth unemployment and people not in education, employment or training (NEETs).

In most cases, the youth unemployment rate is double to triple the global rate. This is especially pronounced when it comes to highly qualified university graduates and young researchers.[499]

Over time, the female unemployment rate has been higher than the male unemployment rate in most Mediterranean countries.[500]

During the UfM Women in Blue Economy webinar in 2021[501] it was emphasised that data is often unavailable or not gender disaggregated which prevents an accurate, state-of-the-art depiction and thwarts policy-specific policies; in some sectors, the employment of women is likely higher than recorded, whilst in others the figures are not known. Participants identified several barriers during the webinar to the inclusion of women in the blue economy, including:

- Regulations, policies, and laws including lack of social protection for certain jobs and lack of participation in decisionmaking
- Social norms and gender stereotypes originating from and manifesting in society, culture, religion, employers and families
- Disproportionate roles in unpaid care work and consequent 'time poverty'
- Inequality in access to resources and services, including skills and education, information, formal and informal networks, financial services and capital, land ownership and tenure, and transport
- Gender-based violence and conflict

Concrete recommendations also emerged during the webinar which have relevance for the current publication. These are:

- Tackling regulatory barriers to women in inclusion, specifically tackle discriminatory policies
- Make women visible where they are, in communication with media, in order that their participation becomes a norm rather than an exception
- Ensure women are included in leadership positions and decision-making
- Providing women education, training and skills specifically tailored to women
- Improved data to understand gender gaps
- Conductinf systemic awareness training
- Supporting advocacy activities
- Ensuring targeted projects, specific to countries, regions and sectors
- Using inclusive terminology
- Ensuring access to support services, especially funding
- Reducing women's work burden and paying specific attention to unpaid care work often performed by women, through smart labour, care policies and the provision of care services
- Encouraging research with women as scientists or the subject of studies
- Creating formal and informal networks dedicated to women participation and collaboration

Additionally, students and young professionals in the Southern Mediterranean Countries are not satisfied with the educational programmes offered by their countries.

45% of graduates declared unsatisfied with the postsecondary vocational pathways offered in their countries while nearly 40% reported their dissatisfaction with the skills acquired.[502]

499 UfM (2024) Green Innovation and Employability in the Med through the Triple Helix
500 More information at: United Nations Environment Programme/Mediterranean Action Plan and Plan Bleu (2020) State of the Environment and Development in the Mediterranean. Nairobi.
501 More information at: https://medblueconomyplatform.org/vkc/news/women-in-blue-economy-in-the-mediterranean-webinar-7c0f2c4eff/
502 UfM and BUSINESSMED (2023) Towards a Union for the Mediterranean Strategy on developing new Vocational pathways in Higher Education

In recent years, the emerging sectors of the Blue Economy have emerged as a new and promising sector for tackling youth unemployment in the Mediterranean.

With potential for job creation and sustainable development, the sector has been heralded as an important opportunity for the social and economic regeneration of the Mediterranean region after the economic crisis and COVID pandemic.

Looking at sector-specific figures, the latest European Commission (EC) Blue Economy report estimated that over one million jobs in Mediterranean countries were in the blue economy within the same year, with more than 40% of the employment attributed to aquaculture, fisheries and mariculture.

The report noted that younger workers held around 17% of the jobs in the sector, indicating that youth employment was a considerable part of the blue economy in the Mediterranean.[503]

Tourism also remains one of the main activities in the region, providing jobs to more than 8 million people in the Mediterranean, of which 2.7 million are youth under the age of 25 and women represent more than half of the total tourism workforce.[504]

The report concludes that the sector has the capacity to absorb additional labour force, especially youth, given the rapid development and transformation of the sector to a more modern framework by adopting digital platforms, digital marketing and information technologies such as the internet of things (IoT), augmented reality and virtual reality.[505]

The blue economy sectors are a promising source of job creation, and its potential for employment and career development is undeniable.

Although the blue economy is a more significant contributor to employment in insular Member States or those with multiple islands such as Croatia, Malta, Greece, Cyprus and Portugal,[506] the sector is a vital employer for coastal and marine communities and regions across the Mediterranean.

However, many sectors in the blue economy currently face difficulties finding adequately qualified and skilled professionals, which hampers their growth.[507-508-509-510]

The main challenges found in skills and labour opportunities within the blue economy sectors, include:

- **Mismatch between the skills of the labour force and the evolving needs of the industry.** A person can be both overqualified and underskilled when their education doesn't match their occupation, leading to a skills mismatch. This often occurs due to digitalization, technological advancements, or when skills are not regularly practiced and become obsolete. These mismatches result from changing labor market demands, where skills obsolescence and over/under skilling coexist. There is a need to adapt the training and education requirements for maritime-related professions, in view of i.e technological developments and climate-related commitments.
- **Shortage of attractive jobs in the blue economy**. Some of the blue economy sectors, such as coastal tourism, do not appear high on the list of the most popular jobs, due to a negative perception of job quality, seasonality and limited career prospects. The challenges of working in offshore environments (e.g. working at heights or in other dangerous conditions) have often discouraged the recruitment of youth in the sector, but the introduction of new technologies (e.g. remote-controlling, etc.) can serve as a compensatory measure supporting the sector's future competitiveness and its wider contribution to the blue economy.[511]
- The phenomenon of '**brain drain**' strongly hits the Mediterranean region, affecting also the maritime industry. Palestine, Morocco, Lebanon, Tunisia and Algeria are examples of countries suffering the migration of a large number of educated and skilled individuals from their own country to work abroad where they can find better salary, work conditions and opportunities.[512]
- **Women continue to face barriers to recruitment**, the 'glass ceiling' impeding women from progressing to senior positions, difficulties balancing work/family life, and lack of security at certain offshore works in a still male-dominated maritime industry.

503 European Commission (2024) https://op.europa.eu/fr/publication-detail/-/publication/ef90077b-1e82-11ef-a251-01aa75ed71a1
504 WINBLUE (2022) Summary of the quantitative analysis on gender status in blue economy sectors
505 Plan Bleu - Regional Activity Centre of UNEP/MAP (2022) State of play of tourism in the Mediterranean.
506 Ibid, p. 2
507 EUROMESCO (2024) A sustainable blue economy for the Mediterranean: challenges, opportunities and policy pathways.
508 FLORES (2024) Guidelines to promote innovative approaches in LLL for ORE
509 CLUSTER Project (2024) How Circular Economy Can Create Circular Jobs
510 CLUSTER Project (2023) Policy Report: Blue economy as an opportunity for enhancing youth and women's employment in the Mediterranean.
511 Sdoukopoulos, E., Tsafonias, G., Perra, V.-M., & Boile, M. (2020) Baseline report on present skills gaps in shipbuilding and offshore renewables value chains.
512 Friedrich Naumann Foundation (2023) The migration of young Mediterranean talent and the challenge of employability.

- **Aging workforce.** In Europe, approximately 40% of the existing workforce in the shipbuilding and ship-repair industry is between 41 to 55 years old, while 13% of employees are above 55 years old, nearly 1% of the sector's workforce will retire on an annual basis over the next few years.[513]
- **Lack of high-specialization training** such as welding capabilities, the ability to work at heights or in confined spaces. Additionally, the few training programmes available are offered only in the national language, limiting the option to attract foreign students and the mobility of academics and researchers.[514]
- **Need of upskilling and reskilling.** There is a pressing need to continuously improve existing skills and develop new ones so that the adaptation gap to new market dynamics and disruptive technology implementation. It also involves soft skills, where critical thinking and problem-solving, communication and collaboration and creative thinking and innovation are some of the biggest gaps identified in the maritime industry.[515]
- **Shortage of green skills**. Developing a low-carbon economy depends on improving existing skills rather than specialised green skills. Maritime professionals need to understand why and know how to use high-tech equipment and integrated systems to protect the environment, measure and reduce emissions, be aware of the EU and international legislation and other environmental aspects.[516]
- **Outdated skills and educational material**. Current skills are characterised by the short-term resilience, especially in new areas such as digitalisation and automation onboard and ashore,[517] making necessary the modernization of the learning topics and schemes.
- **Lack of digital skills**. Overall, more than 1/3 of the EU's labour force lack the digital skills required in most jobs.[518] There is a growing demand for professionals who possess advanced digital skills (e.g. artificial intelligence, mechatronics, 3D printing, Internet of things, cloud computing, big data analytics, etc.), and are also competent to handle the new, low-carbon and zero-emission technologies.
- **Ensuring inclusivity in the blue emerging sectors.** it is crucial to address disparities in access to education and training programs, especially for the youth, women and other disadvantaged groups, to prevent the perpetuation of existing inequalities. This includes the risk of low-skilled workers being left behind as industries transition away from traditional energy sources like oil. To mitigate these challenges, proactive measures must be taken to facilitate the upskilling and reskilling of the current Mediterranean workforce to meet the evolving demands of the green/blue economy.[519]

At EU level, the Commission has developed specific initiatives to address the shortage in skills. The European Skills Agenda is a 5-year plan to help individuals and businesses develop more and better skills, and to put them to use in the real work environment.

Ambitious targets have been set up, such as achieving 70% of adults aged 16-74 having, at least, the basic digital skills.[520]

Within the blue economy, the successful blueprint alliance for sectoral cooperation on skills in maritime technologies contributed to the setting up of a large-scale Partnership for Offshore Renewable Energy under the Pact for Skills.[521]

Figure 25 Key actors involved in the Pact for Skills

Source: FLORES (2024)

513 Ibid, p. 2
514 Ibid, p. 2
515 Ibid, p. 2
516 SkillSea Project (2023) Recommendations for Education and Training
517 SkillSea Project (2023) Summary of SkillSea strategy, key findings and recommendations
518 European Commission (2023) The European Pillar of Social Rights Action Plan. Plugging the Digital Skills Gap
519 European Training Foundation (2023) Skills for the green transition. Evidence from the EU Neighbourhood
520 European Commission (2020) European Skills Agenda
521 More information at: https://pact-for-skills.ec.europa.eu/about/industrial-ecosystems-and-partnerships/renewables_en

In the Mediterranean, the 2021 UfM Ministerial Declaration on Sustainable Blue Economy includes blue skills, and decent and sustainable blue careers and employment among the 10 joint priorities agreed by the Mediterranean countries.

In particular, the declaration recognises the urgent need (i) to address the mismatch between the skills of the labour force and the evolving needs of the market, including by prioritising Vocational Education and Training (VET) and tailoring training and educational curricula to new and emerging requirements; and (ii) to better integrate private sector actors in the school-to-work transition.[522]

The recently adopted Western Mediterranean Initiative (WestMED) Ministerial Declaration for the Sustainable Development of Blue Economy recognises, firstly, the need to support blue skills and the creation of jobs with upskilling and reskilling of the workforce to meet the demands of new jobs and technologies, facilitating the process of mutual recognition of qualifications to increase the cross-border mobility of workers in blue economy sectors, as well as ensuring the promotion of maritime professions.

Secondly, the need to strengthen the involvement of young people in favour of the Mediterranean through education, knowledge development and awareness-raising actions on the conservation, restoration and sustainable use of resources.[523]

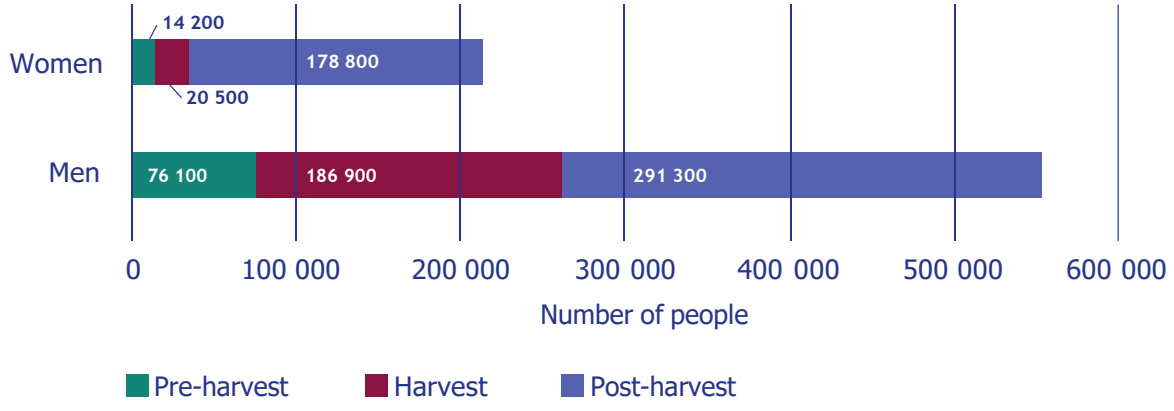
Landscape of skills and employment for Women and Youth within the Blue Economy

Only 67.7% of women in the EU are employed, compared to 78.5% of men, despite higher formal educational attainment. Only 7.5% of board chairs and 7.7% of CEOs in the EU are women. Women are underrepresented in key sectors for the green and digital transitions, for example women only represent 33% in the renewable energy sector, 21% in the wind energy sector[524] and 34% of Science, Technology, Engineering and Mathematics (STEM) graduates.[525] Over time, the female unemployment rate has been higher than the male unemployment rate in most Mediterranean countries.[526]

Despite the high diversity of women's engagement in some blue economy sectors in the Mediterranean, such as fisheries, their contributions are often not captured in official statistics, reinforcing the misconception that women do not play a role in this sector.

Official data are rarely gender-disaggregated and generally do not cover employment along the entire value chain.[527] The idea that fisheries (and other blue economy sectors) are a male sector, despite the extent and importance of women's work along the value chain, contributes to the invisibility of women's roles.

Figure 26 Total gender-disaggregated employment in the fisheries sector by value chain stage in the Mediterranean



Source: FAO (2023)

522 Ibid, p. 1
523 WestMED Initiative (2023) WestMED Ministerial Declaration on Sustainable Blue Economy
524 Ibid, p. 2
525 European Commission (2023) The European Pillar of Social Riaghts Action Plan. Plugging Gender Gaps in the Labour Market
526 Ibid, p. 1
527 FAO/GFCM (2024) Women in fisheries in the Mediterranean and Black Sea region

Additionally, there is still a higher rate of unemployment of women in maritime sectors such as marine renewable energy and maritime transport. Wealth loss due to the gender gap is estimated at 10% of the gross domestic product (GDP) in advanced economies and more than 30% in the Mediterranean region.[528]

As highlighted in the UfM Youth Strategy 2030, one third of the European population are under 30 while 48% of the people in the Southern Mediterranean region are under 30. However, youth unemployment is a major issue in EU and the Mediterranean countries, 15% of young women and men (between 15 and 34) within the EU are neither part of the labour force nor receiving education or training.[529]

The blue economy sectors have the potential to provide opportunities for improving career prospects in the Mediterranean, especially for youth and women, who can help to shape the future of the sea basin.

Table 22 Overview of specificities in skill needs and career potentials across sectors in the Mediterranean

Blue economy sector	Skills needs and careers	Landscape , trends and opportunities for youth & women
Fisheries and aquaculture	• Skills on digitalization and innovation, including automation of the aquaculture farms e.g. remote sensing, GIS, real-time monitoring, etc. • Skills on circular economy and impact reduction based on science- and nature-based solutions, e.g. bio-waste management and marine biotechnology. • 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).	• Aquaculture is rivalling the traditionally larger workforce of the fisheries sector. • The workforce is aging and only 17% of the workers are under 25 years old and the role of women is often “invisible” in the Mediterranean. • Digitalization offers new opportunities in data collection, analysis, AI monitoring, and marine resources management.
Transport and ports	• New technologies to make maritime transport more sustainable, reduce environmental impacts and improve circularity. • Competencies needed: Logistics and optimisation methods to achieve high utilisation of ships, operation of complex hybrid and zero emission machineries, future onboard power and energy production, calculation and documentation of emissions and performance management systems. • Managerial ability to redefine just-in-time models and re-define the current supply chains.	• Marine transport sector is facing labour shortages in the Mediterranean. • Employment in maritime transport and ports often fluctuate as it is sensitive to external crises and shocks, e.g. COVID-19. • Ports hold the potential to employ people in a diverse range of areas and future skills related to digital and green transition. • Demand of use technology in training (virtual reality and simulators) • Globally less than 2% of seafarers are women.

528 ASCAME (2023) Women entrepreneurs transforming the Mediterranean scene
529 UfM (2022) Youth Strategy 2030 - MEDiterranean youth towards a common goal

Blue economy sector	Skills needs and careers	Landscape , trends and opportunities for youth & women
Coastal and Maritime Tourism	• Digital skills to use platforms for tourism services, use of technologies (virtual reality, remote tourism and augmented reality) and real-time market intelligence • Entrepreneurial skills needed to design innovative business models for sustainable tourism. • Skills and ability in promoting diversification of the tourism offers to overcome seasonality and concentration over specific months. • Other skills needed e.g. climate change adaptation management, carbon neutrality efforts, circular economy skills, e-marketing, e-commerce and business management skills. Tourism professionals are expected to provide innovative, customised and value-added services to a wider range of target groups, including seniors or travellers with special needs (disabilities, etc).	• COVID-19 boosted 'slow tourism,' nature-based destinations, sustainable, local tourism. • Tourism absorbs more labor, especially youth, through digital platforms, digital marketing, IoT, augmented reality, and virtual reality. • 13% of the tourism-related work force are aged under 25. • 58% of those employed in core tourism activities are women, however only the 3% of executive spots in the cruise industry are held by women .Tourism is algo the largest employer of migrant and part-time workers.
Marine Renewable Energy	• New skills needed, especially digitalisation, ICT, robotics, environmental issues and health and safety. • Skills of special interest in the sector: smart grid and smart sensors, big data, automation and advanced robotics, energy storage and 3D printing. • Offshore specific skills (working at sea, working at heights, ORE technologies and their main principles, offshore site research such as marine geology, environmental, geophysical and geotechnical investigations).	• 27% of companies find difficult to fill the job positions they offer within the MRE industry • Women are underrepresented, only 21% of the workforce is being leaded by women of the workforce, and this is especially significant in wind energy sector where. Furthermore, the female representation in wind energy sector is usually associated to administration roles and even lower in senior management roles. • The new VET learning environments i.e., work-based learning environment may help to increase the attractiveness of the sector among youth.
Maritime safety and security	• Strong digital skillsets and specific re-skilling and up-skilling pro-grammes on cyber security • Artificial Intelligence, automated systems technologies and big da-ta. • Multidisciplinary will be key for new processes and programmes (ICT, management, math, sociolo-gy, law, etc.)	• Growing Mediterranean blue economy increases demand for security personnel due to new challenges (niche for new ca-reers). • Youth engagement is essential in order to ensure the sustainability of the sector in the future. • Job opportunities arise in security, cyber-security, monitoring, innova-tive technologies, and environ-mental protection. • Still a male-driven sector with efforts needed to reduce gender gaps.

Blue economy sector	Skills needs and careers	Landscape , trends and opportunities for youth & women
Fighting marine litter (opportunity for valuable new jobs)	• Circular economy skills and waste management to apply principles of restoration, regeneration, re-use, sharing, and other practices. • Knowledge on eco-design principles and bio-based materials. • Litter-free solutions for businesses and start-ups. • Research skills, data collection and assessment.	• Marine conservation and management roles may expand, integrating circularity principles into existing jobs rather than creating new sectors. • Potential for increased jobs in waste life cycle: sustainable product design, packaging, production, waste management, prevention. • Increased demand for consultants and policy advisors. • Increased roles relating to scientific research including data collection, monitoring and assessment.
Research and innovation (transversal to sectors)		• Growing activity (cross-cutting careers) • Women are underrepresented in research on blue economy in terms of leadership of project coordinators, patent leaders and publications as first author. • Innovative areas and research in blue biotechnologies, low-carbon technology, and sustainable practices can create new jobs in the Mediterranean Blue Economy • An important area for employment of young researchers and women.

In 2023, the "Blue careers for a sustainable blue economy" European Maritime, Fisheries and Aquaculture (EMFAF) Funds call made available EUR 7.5 million to contribute to the development of the next generation of blue skills and to provide opportunities for attractive and sustainable maritime careers.[530]

Since 2014, €18.5 million have been mobilised under the EMFAF call of Blue Careers.[531]

A comprehensive and deep mapping of projects funded by the EC related to blue skills and careers has been undertaken.

Figure 27 shows the number of projects funded by different programmes (EMFF & EMFAF, Horizon Europe, Interreg, Erasmus+ and ENI CBC MED) in the last decade under the different subsectors of the blue economy. More than 50 EU-funded projects have been identified aiming at enhancing blue skills and careers in the blue economy sectors.

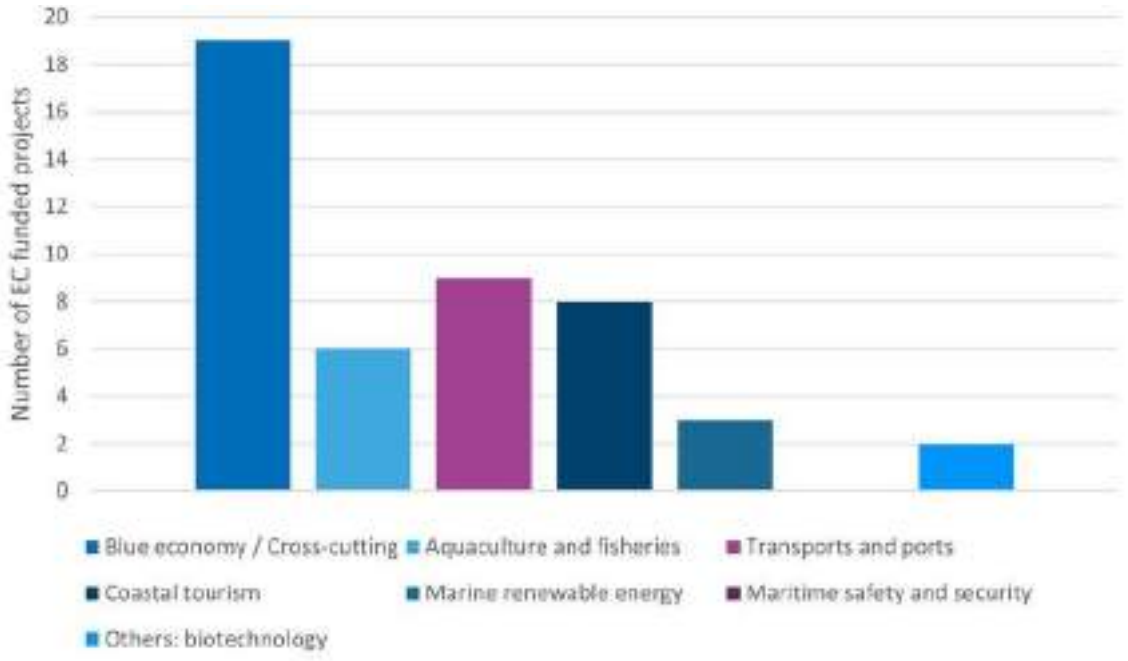
Several blue skills and careers-related projects, including Mediterranean partners, have been recently funded.

For example, BlueTec project[532] aims to set up, test and validate a triple transition training and skills development model (green, blue, digital skills).

The Blue-Ports supports the development of blue skills of port staff as a catalyst, bridging the gap between existing services and the targets set out in the European Green Pact.[533]

On coastal tourism, the COASTAL PRO project aims at developing innovative teaching and training approaches by creating a gamification framework featuring a playful experience approach.[534]

Figure 27 Mapped projects on blue skills and careers categorised by blue economy subsectors since 2014 up to date



Source: own elaboration based on EC funded projects analysis (2024)

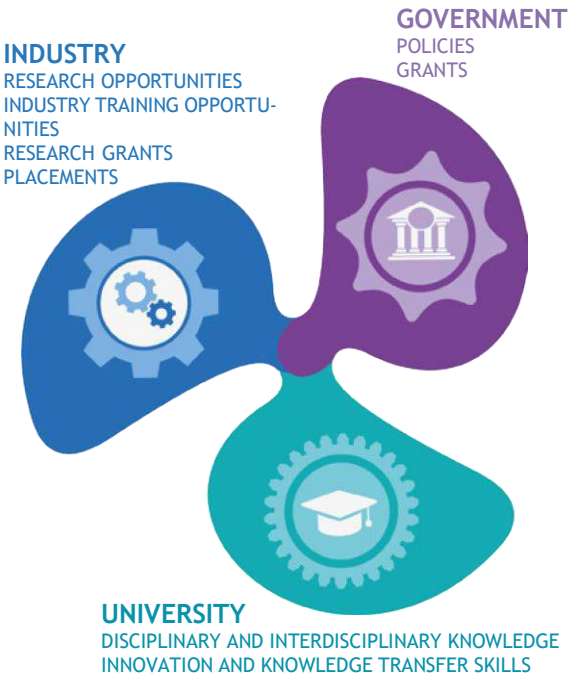
530 CINEA (2023) EUR 15.1 million to be awarded for EMFAF Blue careers and Regional flagships projects
531 More information at: EMFAF Blue Careers Infographic 2022
532 Partners from: France, Greece, Romania, Croatia, Portugal, and Italy. More information at: https://ubluetec.eu/
533 Partners from: Greece, Spain, Italy, Georgia and Tunisia. More information at: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/43392145/101124958/EMFAF
534 Partners from: Greece, Spain, Portugal and France. More information at: https://coastalpro.eu/

Actions and trends to enhance blue employment

Educational and employability programmes should be designed following the Triple Helix Model for Innovation, which offers a framework that brings together three spheres that traditionally operate separately (university, industry, and government).

The Triple Helix Model theorizes that in a knowledge-based society, boundaries between different spheres are increasingly fading, giving rise to a system of overlapping actions: (a) universities and research centres are the source of new knowledge and technology; (b) industry operates as the centre of production; and (c) government provides an enabling environment (e.g. providing incentives, autonomy and stability).[535]

Figure 28 Triple Helix Model of Innovation

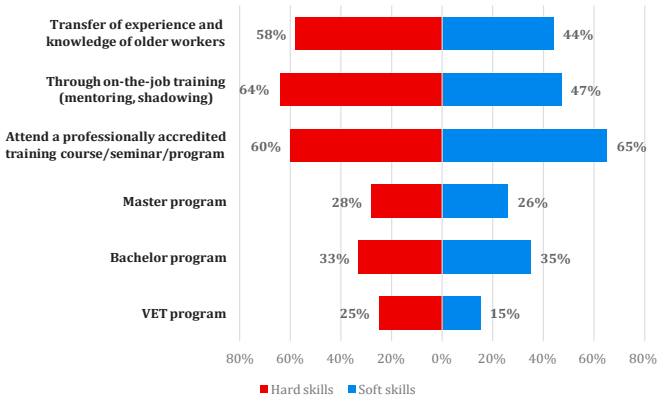


Source: UfM (2024)

To align educational offerings with labour market needs, it is essential to promote up-skilling and re-skilling schemes, particularly in SMEs, and to enhance communication and cooperation between academia and industry.

Figure 28 shows the different preferences of the employers to acquire or develop new hard and soft skills. In some sectors, the transfer of experience and knowledge from old workers to new employees could be more effective than studying a Master program.

Figure 29 Most appropriate method for employees developing the required hard and soft skills



Source: MATES project (2020)

535 UfM (2024) Green Innovation and Employability in the Med through the Triple Helix

Adapting and modernizing learning schemes to reflect the latest technological developments and climate-related commitments will increase the attractiveness of maritime careers among younger generations.

This can be achieved through new training tools such as gamification, training simulators, virtual and augmented reality, digital tools, e-learning, and hybrid solutions.

When designing training programs, applying equality and inclusivity practices is vital to ensure that all individuals, regardless of gender, race, religion, culture, or language, have equal opportunities and access to educational resources.

Inclusive practices in Life-Long Learning (LLL) courses should include flexible training designs, accessible materials, adaptable learning paths, and a collaborative classroom environment.[536]

Increasing ocean literacy is a strategic approach to raising awareness among youth about job opportunities and attracting them to ocean-related careers. Blue entrepreneurship can be a powerful tool for creating employment opportunities for young people.

Sectoral partnerships within the blue economy, such as the Pact for Skills in Offshore Renewable Energy (P4S-ORE), are crucial for stimulating dedicated training offers, promoting workforce re-skilling and up-skilling, and attracting new talent.[537]

In countries with limited funding, establishing skills funds in partnership with the private sector can support the transition to a low-carbon future, particularly in the Global South, where there is a growing demand for skilled workers in areas such as waste management, eco-friendly construction, and sustainable transportation.[538]

Finally, accurate data capturing the role of women in the sector is necessary for developing evidence-based policies that address environmental and socioeconomic challenges and for monitoring progress towards gender equity.

Facilitating women's access to training and project meetings by accommodating their time and mobility constraints, providing transportation, and ensuring a welcoming atmosphere with female trainers will help them actively participate and benefit from these opportunities.

536 Ibid, p. 2
537 Ibid, p. 3
538 Ibid, p. 3

FUTURE (2025-2030)

The Roadmap for the implementation of the 2021 UfM Ministerial Declaration points towards potential future avenues of collaboration tackling blue skills, careers, and employment, including:

- Further developing socioeconomic observatories; further collaborating with the private sector; continuing to foster the ongoing regional dialogue, with a special focus on women and youth; and
- Further supporting ocean literacy and its integration in educational and training curricula.[539]
- Further use of the Mediterranean Blue Economy Stakeholder Platform[540] managed by the UfM Secretariat to facilitate contacts between existing education networks, exchange information including pedagogic tools and serve as an interface for mobility programs.

Across the EU and the Mediterranean, around 10 million green jobs (including blue jobs) could be generated by 2030. Across the Mediterranean, a total of 4.6 million are expected to be created.[541]

Onshore and offshore wind industry alone may employ globally 3.7 million people by 2030 and more than 6 million people by 2050.[542]

At European level, so far, the volume of blue economy jobs slowly increases when comparing the data from the last decade. However, significant differences can be observed by sectors.

For instance, the oil and gas sector employed 9,490 people in 2020, less than one fourth of those employed in 2009. This sector has been on a downward trend, in line with the net-zero emission targets and decarbonisation objectives of the EU while other emerging sectors, such as the offshore wind sector, have grown by 258% in terms of persons employed in the last decade[543-544]

There are also significant differences in terms of gross remuneration by blue sectors. Average gross remuneration per employee is lowest in coastal tourism and marine living resources, whereas it is highest in marine non-living resources and marine renewable energy.[545]

The European Training Foundation highlights that green/blue transition is transforming employment across various sectors and skill levels.

By 2035, most sectors are expected to see an increase in highly qualified workers, while medium-level qualifications are anticipated to remain relatively stable, and low-qualified positions are projected to decrease (See Table 23).[546]

539 UfM (2023) Roadmap to set the path towards the implementation of the 2021 UfM Ministerial Declaration on Sustainable Blue Economy
540 More information at: https://medblueconomyplatform.org/
541 UfM (2023) Green Circular Economy at Mediterranean Level including Green Skills and Jobs
542 IRENA (2019) Future of wind: Deployment, investment, technology, grid integration and socio-economic aspects (A Global Energy Transformation paper)
543 Ibid, p.2
544 European Commission (2024). The EU Blue Economy Report 2024
545 Ibid, p. 9
546 Ibid, p. 3

Table 23 Expected level of skills and blue occupations

Skills levels	Nature of change	Example occupations
Low-Skilled level occupations	Generic change, i.e., environmental awareness; adaptations to work procedures, use of new materials, compliance with environmental regulation (e.g. labour law).	Waiters/receptionists coastal touristic complex, aquaculture/fisheries food preparation worker, etc.
Medium-Skilled level occupations	Emergence of new green/blue occupations; Substantial changes to some existing occupations in terms of technical skills and knowledge.	New occupations such as offshore wind-turbine operators, offshore aquaculture installers, etc.
High-Skilled level occupations	High focus on new green/blue occupations. Significant changes to some existing occupations in terms of technical skills and knowledge.	New occupations: ocean numerical modellers, climate-change scientists, blue carbon consultants, etc.

Growing blue economy sectors

A recent BlueInvest report highlights that there are three dominant sectors in Europe in terms of the number of investments deals closed: marine renewable energy, blue tech and ocean observation and aquaculture.[547] However, other emerging blue economy sectors have been identified as enablers of future job creation:[548]

- **Aquaculture** appears to be one of the most dynamic sectors of the blue economy. It generated a relatively high number of deals and receives more growth-stage investments aligned with the recognised growth potential of SMEs in this high-profile sector. Some emerging areas of job opportunities in this sector include the genetic improvement of the species, design of recirculating aquaculture systems, digitalisation in aquaculture, use of satellite monitoring, fish handling systems, use of Remotely Operated Vehicles (ROVs) in aquaculture and offshore cultivation farms, among others.
- **Blue biotechnology** considers the non-traditionally commercially exploited groups of marine organisms (such as bacteria, fungi, micro- or macroalgae) and their biomass applications (food supplements, cosmetics, fertilisers and innovative commercial uses such as biomaterials, bioremediation or biofuels). This sector is currently one of the least developed sectors, but the number of deals has increased over time and investors often follow their investments from seed to more advanced stages, showing a clear potential of this market. The areas of job opportunity within this sector include research, marine environment, biomass production and processing, product innovation and differentiation, technology and infrastructures, and policy and regulatory framework.[549]
- **Marine renewable energy** (in particular, offshore wind) is the most dynamic sector in terms of total number and volume of deals, reflecting the size and established nature of the renewable energy market. At EU level, is the fastest growing sector in relative terms, and probably one of the fastest growing in the EU economy as a whole. The turnover of this sector grew from €91 million of turnover in 2009 to €3.4 billion in 2021 in nominal terms.[550] The vibrancy of the sector is also reflected through the number of investors, which has increased rapidly in the last period. Other emerging marine renewables such as tidal, wave and floating solar photovoltaic energies are rapidly growing, as well as proving new job opportunities. The areas of jobs opportunity within this sector include mechanical work, marine engineering, supply industry, project development, operations and maintenance, boating and transport, research and science, construction, marine permitting, and environmental regulations, among others.
- **Decarbonisation and digitalisation of the maritime industry.** The maritime industry, a significant part of the Mediterranean's blue economy, faces challenges such as market fluctuations, international crises, and substantial pollution. A key goal is to green maritime transport, including shipping, port operations, shipbuilding, and maintenance. The strategy involves rapidly transitioning from fossil fuels to renewable fuels like biofuels and e-fuels (methanol and ammonia). By 2050, approximately 750,000 seafarers will need additional training to manage alternative fuels and technologies.[551]

547 BlueInvest (2024) Investor Report: Unlocking the potential of the Blue Economy
548 Ibid, p. 2
549 Ibid, p. 2
550 Ibid, p. 9
551 DNV (2022) Insights into seafarer training and skills needed to support a decarbonized shipping industry

The industry will also become more digitalised and automated, necessitating new skills and competencies. Emerging job profiles will include seafarers, new fuel experts, emergency technicians, environmental officers, energy efficiency managers, chemists, physicists, data and digital managers, ocean sensing experts, and underwater robot pilots. Essential digital skills will include remote operation control, data logging and analysis, and basic knowledge of digital technologies (IoT, sensors, networks, cybersecurity, connectivity, machine learning, etc.). In Mediterranean ports, the majority of job vacancies are for roles such as data analysts, cybersecurity managers, cold supply chain experts, energy transition managers, onshore power supply managers, and circular economy managers.[552]

- **Sustainable coastal eco-tourism**. Eco-tourism is presented as a sustainable alternative of the traditional tourism model, in which the main motivation of tourists is the observation and appreciation of nature as well as the traditional cultures prevailing in natural areas. Examples of eco-tourism include pesca-tourism, culinary tourism, sport and adventure tourism, accessible tourism, nature and culture hiking itineraries and underwater reality-augmented experiences. In order to move forward to a more sustainable tourism sector, new hard skills are needed for newly developed occupations (e.g., destination management, climate change adaptation management, carbon neutral efforts, new business models in tourism, e-marketing, e-commerce, and business management skills). The areas of emerging job opportunities include: digital platforms for tourism services, use of technologies (virtual reality, remote tourism and augmented reality) and sustainable boating.
- **Blue tech & ocean observation** involves turning ocean data into information for services, science, policymakers and management, and centres around data collection, modelling and prediction, as well as the supply of the associated instruments and infrastructure. It is the second highest sector in terms of the number of investment deals. Corporations and private equity players have provided a particularly substantial amount of investment in this sector. The emerging areas of jobs' opportunities include the use of smart sensors for ocean monitoring and vessel recognition, unmanned sea systems, digital twin and digital technologies (high-performance computing, artificial intelligence, big data and the internet of underwater things) for ocean observation.

552 DocksTheFuture (2020) Ports' relationship in the Mediterranean region: future cooperations, competences and competitions

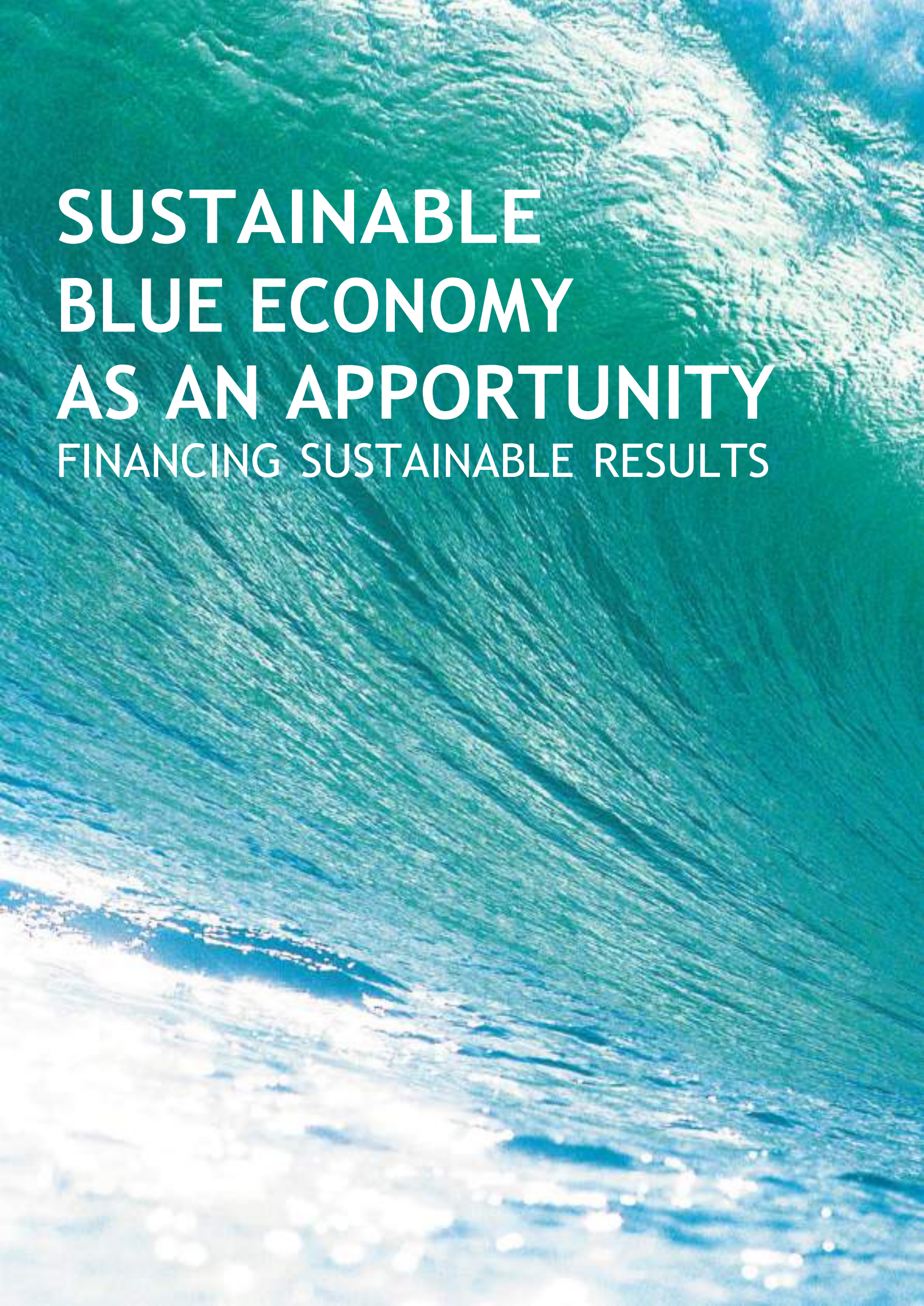
Future skills needs

Apart from the technical skills (associated to the specific sector), several overall skills will be required to meet the needs of the traditional and emerging blue sectors, including:

Table 24 Blue sector skillls needs

Skills	Description
Green skills	Including the use of use of 'greener' fuels and technologies, knowledge of the international and national environmental regulations, environmental economics and skills to ensure the health and safety of workers.
Digital skills	Including the use of technologies such as digital communication and teamwork, sensors, IoT, networks, cyber security, digital twin, and so on.
Innovation skills	Close interaction between maritime professionals and industrial clusters with researchers provides a faster and more precise path to innovation as knowledge creation and strength of R&D.
Language skills	These are essential in the blue economy sectors to allow international communication and cooperation (e.g. global trade, maritime shipping, tourism, etc) as well as to be able to navigate through the international maritime and environmental laws. Needed also in marine scientific research to collaborate in international teams and to enrol in specialised training on blue economy sectors.
Transversal/soft skills	These are essential for transitioning between value chains in blue economy sectors include effective task and workload management, encompassing planning, coordination and management, personnel assignment, and prioritization under time and resource constraints. Additionally, effective communication both onboard and ashore, decision-making that considers team experiences, assertiveness, leadership, motivation, and maintaining situational awareness. Finally, strong problem-solving techniques are necessary, including situation and risk assessment and outcome evaluation.
Sales & Marketing and Business Competencies	These are notably lacking across all curricula. Given their importance as essential entrepreneurial skills, the need for their implementation is clear.[553] These include the ability of the professionals to develop innovative business model and scale up innovation by successfully engaging with impact investors across the region.

553 TEAMS Project (2021) Gap analysis on soft skills in the maritime industry



SUSTAINABLE BLUE ECONOMY AS AN APPORTUNITY

FINANCING SUSTAINABLE RESULTS

INTRODUCTION

Sustainable blue finance has gained considerable attention in recent years as a key opportunity to drive innovative and sustainable finance and investments towards sectors and activities within the Mediterranean Blue Economy.

This development has emerged from the recognition that business-as-usual investments are harmful to the health of the oceans and pose great risks to the sustainability of the ocean as a resource.

The vital role of blue finance in supporting a sustainable transition in the Mediterranean region, as well as the related opportunities and challenges, were recognised in the 2021 UfM Ministerial Declaration on Sustainable Blue Economy.[554]

Blue finance, in fact, offers an important gateway to address pressing challenges related to the sustainable development of the sectors and activities of the Mediterranean Blue Economy, and to promote the health of marine ecosystems while also contributing to economic growth to the benefit citizens, economies, and ecosystems in the Mediterranean region.

The Declaration outlined the uneven levels of economic development and access to finance between countries across the Mediterranean region and the lack of capacity for developing UfM countries.

In doing so, it also calls for financial institutions, development partners, and public and private actors to prioritise investment in the sustainable blue economy, encouraging UfM members to continue making the necessary domestic reforms to create a conducive environment for financials investments.[555]

The 2022 DG MARE sponsored UfM Conference on Blue Finance 'Investing in a Mediterranean Sustainable Blue Economy'[556] and the 2nd UfM Annual Stakeholder Conference on Sustainable Blue Economy[557] highlighted economic viability as a central theme towards the achievement of SBE objectives.[558]

In particular, the need to support financial investments and the opportunities offered to Southern Mediterranean countries through the Blue Mediterranean Partnership (BMP) were highlighted, along with the need for greater cooperation among blue economy stakeholders and financial institutions, echoing the message of the 2023 WestMED Ministerial Conference.[559]

Additionally, technical assistance in supporting bankable projects was noted as a key means to support better vision regarding the management of existing funds to allow for greater alignment of southern pipelines due to the potential offered by various innovative financing mechanisms.

554 Union for the Mediterranean (2021) Ministerial Declaration on the Sustainable Blue Economy.
555 European Commission. (2022) UfM Blue Finance Conference: Investing in a Sustainable Blue Economy in the Mediterranean.
556 More information at: https://medblueconomyplatform.org/fr/vkc/event/ufm-conference-on-blue-finance-investing-in-a-mediterranean-sustainable-blue-economy-37736e4281/
557 UfM (2024) 2nd UfM Stakeholders Conference on sustainable blue economy
558 Ibid
559 WestMED (2023) News - WestMED Conference 2023: more than 100 stakeholder groups gather in Malta to discuss Blue Economy developments and opportunities.

CROSS-CUTTING THEMES

Finally, the role of key players as intermediaries with local businesses and startups, the need to learn how to effectively communicate with national and international banks,and persuading local and international investors on the opportunities of blue financing were all highlighted at the Conference.

These takeaways build on the outcomes of the inaugural Conference in 2022, which saw the intensification of efforts toward a Blue Med Partnership[560] by the UfM, European Commission, European Bank for Reconstruction and Development, European Investment Bank, Agence Française de Développement, various other donors, and initial beneficiary partners Morocco, Egypt, and Jordan.

Box 9 Blue Mediterranean Partnership (BMP) supporting a sustainable blue economy

On June 22nd 2022, the DG MARE sponsored Union for the Mediterranean's Conference "Investing in a Sustainable Blue Economy in the Mediterranean" took place in Barcelona with the goal of encouraging investments in - and funding of - Sustainable Blue Economy projects and initiatives in the Mediterranean region, especially in Southern Med countries. As a result, the Blue Mediterranean Partnership (BMP) was launched as a flagship initiative in the region, with the aim to tackle the Mediterranean Sea's severe environmental threats by scaling up the financing of sustainable blue economy investments in the region.

In late November 2023 at COP28, partners and donors of the Blue Mediterranean Partnership reaffirmed their commitment to developing the Mediterranean sustainable blue economy with parties identifying a remarkable portfolio of sustainable blue economy investments and reaffirming the aim to mobilise at least €1 billion.

The new multi-donor fund – BMP Fund – will be managed by the European Bank for Reconstruction and Development (EBRD) and will secure additional funding from donors for project preparation and blended finance. Pledged contributions kickstarted with €1 million from the European Commission, €6.5 million from the Swedish International Development Agency (SIDA) and €2 million from Agence Française de Développement (AFD), with more donors and countries expected to follow.

Several financial institutions such as the European Investment Bank (EIB), AFD, Kredinstalt für Wiederaufbau (KfW), Cassa Depositi e Prestiti (CPD) and EBRD will co-operate to co-finance blue economy projects which will benefit from the Partnership and mobilise existing funding from the European Commission through the Neighbourhood Investment Platform and the ESFD+ fund.

On 23rd May 2024, the Steering Committee of the Partnership – chaired by the UfM and Sweden and which, among its key roles, facilitates the political dialogue towards the identification of to-be-funded sustainable blue economy projects – met for the first time at UfM Headquarters in Barcelona. The UfM hosted donors, implementing partners, and beneficiary countries who identified sustainable blue economy investments in Morocco, Egypt and Jordan in addition to other EU Southern Neighbourhood countries.

Source: https://ufmsecretariat.org/blue-mediterranean-partnership-cop28/

560 More information at: https://ufmsecretariat.org/gathering-blue-med-partnership/

OVERVIEW

Coastal populations around the world currently contribute to about €1.5 trillion each year in economic and environmental benefits to the global economy, and this amount is expected to rise to €3 trillion by 2030.[561]

In the EU, the direct GVA of the Blue Economy "established"[562] sectors was €171.1 billion in 2021, contributing 1.3% to the EU-27 economy – increasing by 35% from 2020 figures.[563]

International organisations have played and will continue to play an instrumental role in the achievement of a sustainable blue economy in the Mediterranean.

The UN has actively worked to promote the implementation of SDG 14 (Life Below Water) through the development of various initiatives, such as the UNEP Sustainable Blue Economy Finance Principles.

Launched in 2018, the principles are a global guiding framework which set out guidelines and ocean-specific standards for banks, insurers, and investors in ocean finance, which will allow the financial industry to mainstream sustainability of ocean-based sectors.[564]

The UN Environment Programme Finance Initiative (UNEP-FI) is actively supporting the Sustainable Blue Economy Finance Initiative.

This UN convened global community focuses on the intersection between private finance and ocean health to support the implementation of the SustainableBlueEconomy Finance Principles.

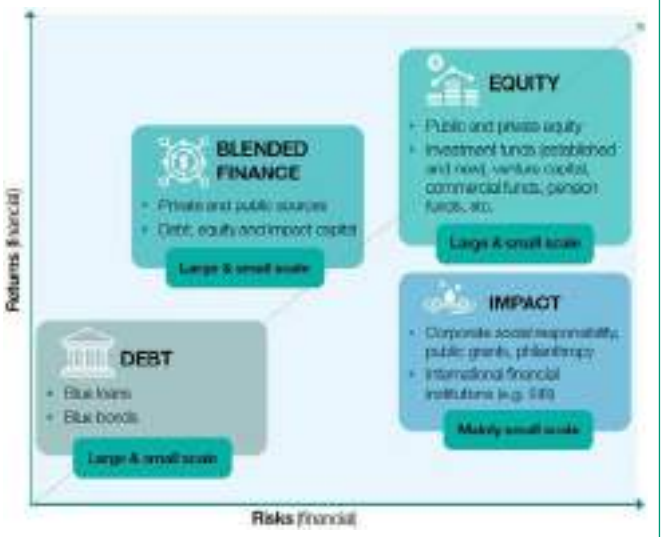
Furthermore, this initiative exists in tandem with the work of the European Commission and the Commission action plan on financing sustainable growth, which has an established EU classification system for sustainable activities. This allows for the coordination of EU financing efforts toward sustainable development which has significant benefits for the Mediterranean region.

Other main sources of investments in the sustainable blue economy for the region include public funding opportunities offered by international organisations, Multilateral Development Banks (MDBs) and green funds.[565]

This 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. In parallel, the private sector has shown a growing interest in sustainable investments through a variety of innovative financial instruments such as blue bonds and blue loans.

A comprehensive overview of the various organisations, initiatives, programmes, and specific calls promoting and financing the diversification of and sustainable development of maritime economies in the Mediterranean can be found under the "Funding Blue Economy" section within the UfM Mediterranean Blue Economy Platform.[566]

Figure 30 Different major capital types and their risk-to-return ratio in the blue financial landscape



Source: BlueInvest Report (2024)

561 United Nations. Department of Economic and Social Affairs and OCSE, 2022
562 EU Blue Economy Report 2024
563 Ibid
564 UNEP (2018) The Sustainable Blue Economy Finance Principles
565 European Commission. (2022). UfM Blue Finance Conference: Investing in a Sustainable Blue Economy in the Mediterranean
566 Union for the Mediterranean (2024) Mediterranean Blue Economy Stakeholder Platform: Funding Blue Economy

CROSS-CUTTING THEMES

Public investment

Public funding grants for a sustainable Blue Economy

Opportunities for EU countries

In the EU, a wide range of funding opportunities have traditionally been available.

The European Maritime, Fisheries and Aquaculture Fund (EMFAF), succeeding the European Maritime and Fisheries Fund (EMFF), supports the EU Green Deal and a sustainable blue economy by implementing actions within EU Maritime Policy, the Common Fisheries Policy, and the overall EU international governance agenda.

It runs from 2021-2027 with the aim of supporting the development of innovative projects in relation to small-scale coastal fisheries, promoting sustainable aquaculture and encouraging investment in this sector to ensure that marine resources are used sustainably within the EU.

It has a total budget of €6.108 billion[567], and has committed to co-financing projects aimed at generational renewal in the fishing sector by supporting the acquisition of vessels by young professionals, of up to 70%.[568]

Under the EMFAF, the Regional Flagships Call "Regional flagships projects supporting sustainable blue economy in EU sea basins" launched in 2023 with a total budget of €7.6 million to support EU sea basin cooperation particularly in the Atlantic, Black Sea, Mediterranean, Baltic Sea Region and EU Outermost Regions.

These flagship calls target Mediterranean actors with specific focus across 6 sectors of the blue economy.[569]

The EU's **LIFE** programme[570] was launched in 1992 and is a spearhead of EU environmental and climate funding.

The 2021-2027 programme includes environment action and climate action as its two main action fields, with the sub programmes consisting of nature and biodiversity, circular economy and quality of life, climate change mitigation and adaptation and clean energy transition.

EU BlueInvest aims to boost innovation and investments in sustainable blue economies technologies by supporting access to finance for early-stage businesses, SMEs, and scale-ups.[571]

It supports investment readiness and provides access to finance for maritime and ocean startups, SMEs, and scale ups, whilst building capacities and promoting opportunities to investors. BlueInvest also manages EIB money.

Additionally, an **Interregional Innovative Investment Instrument (I3 Instrument)**[572] was created in 2023 under the EU Cohesion Policy in order to support investment and the development of sustainable value chains in less developed regions as part of the European Regional and Development Fund (EDRF).

Opportunities for EU and associated countries

In recent years, streams of funding have been introduced targeting both northern and southern Mediterranean countries to ensure equal opportunities and development across the region.

EU Covid-19 recovery and resilience funding amounting to €1.8 trillion continues to support recovery from the pandemic as well as the green and digital transitions across Europe and in particular, for strategic partnerships with EU Southern Neighbourhood countries located in the Mediterranean.

This renewed partnership was identified in 2021 at the 25-year anniversary of the Barcelona Convention.

The **Neighbourhood, Development, and International Cooperation Instrument - Global Europe (NDICI - Global Europe)** aims to support countries with long-term developmental challenges to contribute to achieving the UN 2030 SGDs and objectives outlined in the Paris Agreement.[573] With a total budget of €79.5 billion, it provides financial support to the objectives and programmes outlined in the new Agenda for the Mediterranean set in 2021.[574]

Horizon Europe is the European Commission's Research and Innovation Framework Programme and the largest ever transnational programme supporting research and innovation, involving both EU and non-EU countries. The 2021-2027 budget equals €95.5 billion and is managed by CINEA.

567 European Commission (2021) European Maritime, Fisheries and Aquaculture Fund (EMFAF).
568 Ibid
569 More information at: https://cinea.ec.europa.eu/news-events/news/new-emfaf-regional-flagship-projects-just-kicked-their-work-2023-10-12_en
570 European Commission (2024) CINEA: LIFE Programme
571 European Commission (2024) BlueInvest
572 EISMEA (2024) I3 Instrument
573 European Commission (2024) Neighbourhood, Development, and International Cooperation Instrument - Global Europe (NDICI - Global Europe)
574 Ibid

The Sustainable Blue Economy Partnership is an EU Horizon Europe co-funded partnership consisting of 60 partner institutions from 25 countries and the European Commission to pool research and innovation investments and align national programmes at pan-European scale according to the sea-basin. It contributes to the goals of the Mission Oceans and Waters by supporting the development of various projects with a total budget of €50 million.[575]

The 2021-2027 **Interreg MED** programme specifically supports coordination across Mediterranean borders with a common objective of achieving a climate neutral and resilient society for the benefit of all citizens of the 14 countries from the Northern Mediterranean region.[576]

It has a total budget of €294 million over the six-year programming period.

The **Interreg NEXT** cooperation programmes have a total budget of €1.1 billion from a combination of EU funds and additional national co-funding from member states in order to promote a smarter, greener, more connected, and more social Europe and European Neighbourhood. In particular, the 2021-2027 period will see the running of an Italy-Tunisia programme with a budget of €37 million,[577] and Mediterranean Sea Programme with a budget of €209 million,[578] in order to promote cooperation and achieve mutual objectives.

The **Interreg NEXT MED programme** is in its third generation and is one of the largest cooperation initiatives implemented by the EU across borders in the Mediterranean region.[579]

It includes Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Jordan, Malta, Palestine, Portugal, Spain, Tunisia, Algeria, and Türkiye. It aims to contribute to smart, sustainable, and fair development across the Mediterranean basin by supporting balanced, long lasting, and far-reaching cooperation to address socio-economic, environmental and governance challenges in the Mediterranean region.

The **Sustainable Blue Economy Partnership (SBEP)**[580] consists of 60 partner institutions from 25 EU and non-EU countries as well as the European Commission. It pools research and innovation investments and aligns national blue economy programmes at a pan-European scale. It is funded by Horizon Europe and focuses on the research and innovation agendas of the sea basins, including the Mediterranean Sea Basin. The Partnership has planned €450 million in investments in R&I for the blue economy over a 7-year period between 2022-2029 through six co-funded calls.[581]

Through its Mediterranean Sea basin focus/nodule, the SBEP calls are opening up funding opportunities to Southern Mediterranean countries including Tunisia and Türkiye. To date (June 2024), two out of the seven calls foreseen under the SBEP have been launched.

Similarly, the Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) was established in 2011 as an intergovernmental platform which Is open to all EU member states and associated non-EU countries investing in marine and maritime research. It provides a platform of resources to address ocean-related international challenges through calls for transnational research and innovation projects.[582]

Figure 31 Overview of main priority areas of the NEXT MED programme

Source: enicbcmed (2024)

575 European Commission (2023) News article - The European Commission joins forces with 23 countries through the Sustainable Blue Economy Partnership for the launch of the first co-funded call
576 Interreg (2024) Interreg MED
577 ItalieTunisie (2024) Interreg NEXT Italy-Tunisia Program
578 ENICBCMED (2024) ENICBCMED: Mediterranean cooperation
579 ENICBCMED (2024) Interreg NEXT MED Program
580 More information at: https://bluepartnership.eu/about
581 Ibid
582 JPI Oceans (2024) About JPI Oceans. Available at: https://jpi-oceans.eu/en/about

Opportunities for non-EU countries

The SwitchMed (Phase II) initiative was funded by the EU and implemented by the United Nations Industrial Development Organisation (UNIDO), the United Nations Development Programme (UNEP) Economy Division and MedWaves, the United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) regional activity centre for Sustainable Consumption and Production.

It aimed to speed up the shift to sustainable consumption and production patterns in the Mediterranean through the promotion of circular economy approaches in order to ultimately decouple human development from environmental degradation.[583]

This was done through offering direct multilevel support to the private sector in the creation of a pipeline of investment projects in 8 southern Mediterranean countries in particular: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine, and Tunisia. It was aligned with the Circular Economy Action Plan adopted by the European Commission in 2020.[584]

It also had a separate fund, The Switchers Fund, which is an impact fund for green startups across the whole Mediterranean region, covering blue sectors such as sustainable tourism and food production.[585]

The Swedish International Development Cooperation Agency (SIDA) offers funding for projects which promote sustainable development and poverty alleviation through a wide range of initiatives.[586]

It, along with GIZ and KFW, is a donor to the Blue Mediterranean Partnership.

GIZ, the national development agency of Germany, lead the international financing of climate change mitigation and biodiversity in developing, emerging and transition countries.

It offers financial and technical cooperation in developing countries in a variety of blue economy sectors including for countries in the Mediterranean region.

The Small Grants Programme of the Global Environment Facility (GEF)[587] offers financial support to local community and civil society organisations for projects which support sustainable development and environmental conservation including sectors in the blue economy.

The Prince Albert II Monaco Foundation provides financial support to projects in the Mediterranean Basin which support marine biodiversity, sustainable fisheries and the blue economy in general.

Initiatives include MedFund, a trust fund to provide financial support for the management and sustainability of Marine Protected Areas (MPAs) in the Mediterranean. It aims to enhance marine biodiversity and ecosystem services by offering grants to MPAs to the management and co management structures of Mediterranean MPAs to contribute to the recurrent management costs of these protected areas.[588]

The Foundation also financially supports Beyond Plastic Med: BeMed in cooperation with various other organizations to address plastic and microplastic pollution in the Mediterranean Sea.[589]

Finally, the UfM has a collection of smaller grants which have provided valuable access to finance, particularly for southern partners. The GIZ funded UfM Grant Scheme for 2023 prioritises the development of sustainable skills in the Mediterranean, supports entrepreneurial activity in the green economy and empowers women as part of this transition.[590]

Bilateral donors and National level opportunities

Many other financing sources are also available at the sub-regional and country levels. A highlight of some of the main national public finance opportunities for the Mediterranean Blue Economy follows below.

France: public sector investment bank Bpifrance in partnership with CMA CGM launched a €200 million fund in 2023 designed to accelerate the energy transition in the French maritime sector via grants and equity investment in sustainable advancements in the decarbonisation of fishing vessels and to advance maritime research.[591]

Türkiye: Akbank has implemented the first and only Blue Financing Product Package in Türkiye to develop sustainable tourism, reduce the environmental footprint of marine tourism, port, and maritime activities and to protect the oceans. It includes a Blue Tourism Loan, Blue Port Loan, and a Blue Transportation Loan, with sustainable loan financing until 2030.

Morocco: Banque Populaire Group provides loans and credit facilities to support sustainable fisheries and aquaculture projects and maritime infrastructure. Attijariwafa Bank also provides specialised loans for businesses in the maritime space, and finances projects focused on sustainability in coastal areas.

583 SwitchMed (2024) About us
584 European Commission (2024) Circular economy action plan
585 theSwitchersFund (2024) About us
586 SIDA. (2024) About SIDA
587 GEF. (2024) Funding
588 The Med Fund (2024) About us
589 More information at: https://www.fpa2.org/en/initiatives/beyond-plastic-med-bemed-001
590 Union for the Mediterranean (2023): UfM Grant Scheme to Promote Employment and Entrepreneurship in the Green Economy
591 More information at: https://www.supplychainbrain.com/articles/39570-cma-cgm-and-bpifrance-launch-multi-million-dollar-fund-to-decarbonize-french-maritime-sector

Egypt: the National Bank of Egypt (NBE), Banque Misr (BM) and Banque du Caire (BDC) cooperated with Agence Française de Developpement (AFD) to contribute to financing objectives for the 2030 vision of the Egyptian Government in achieving the UN SDGs, including goals relating to sustainable maritime and coastal sectors.

Greece: the Hellenic Development Bank of Investments (HDBI) invests in projects which support the sustainable use of ocean resources and promotes blue growth. It launched the Green Greek Funds program, which has a budget of €400 million aimed at investing in SMEs and project companies in sectors focused on circular economy and renewable energy for businesses operating in Greece.

Multilateral Development Banks (MDBs)

As part of the broader calls for sustainable and impactful investments aimed to address climate change mitigation and adaptation challenges worldwide, a range of new impact funds have emerged in which a pivotal role is played by Multilateral Development Banks (MDBs).

MDBs finance blue economy initiatives in the Mediterranean mainly through traditional streams of funding such as grants and loans. However, new innovative financial instruments such as blue bonds and loans have also emerged. This is already having relevant consequences in reshaping access to sustainable finance for businesses and SMEs in the Mediterranean.

The European Investment Bank (EIB) is the EU's dedicated 'climate bank' which is investing in and supporting the sustainable blue economy.

Between 2019 and 2023, the EIB invested €366 million in research, development, and innovation related to the ocean,[592] and has invested a total of €6.7 billion in the blue economy so far.[593]

It thus plays a significant role in advancing the blue economy through supporting various initiatives and projects aimed at marine preservation and sustainable blue growth, including low carbon marine solutions, coastal resilience to climate change, ocean related research and innovation and the protection of oceanic natural capital.

In 2023 the EIB launched the EU Blue Champions Scheme to promote and support promising ocean innovation, identify market failures, and highlight gaps in forward-looking technologies across the blue economy sectors. It does so through awarding companies' financial assistance to scale up their businesses which adhere to the EU Mission on Oceans and Waters.[594]

The EIB's main risk finance targeted toward small and MSMEs across Europe and venture capital funding is the European Investment Fund (EIF), which provides funding to stimulate private investment in the blue economy. The EIF has overseen regional partnerships such as the PORTUGAL BLUE Growth Blue I Fund. This fund will see an investment of €28 million from national public resources and the EIB to support SMEs and small Mid-Caps in Portugal and Spain.[595]

The EIF is also supporting the venture capital fund Blue Revolution Fund[596] with €20 million earmarked to boost aquaculture enterprises, address market deficiencies and foster innovation and sustainability in the blue economy.

EU BlueInvest, financed by the EMFF, also aims to boost innovation and investment in sustainable blue economy technologies by supporting access to finance for early-stage businesses, SMEs, and scale-ups.

Similarly, the European Initiative for Financial Inclusion (EUIFI) provides funding through the Neighbourhood Investment Facility wherein grants and loans are blended with leading EFIs to a total budget of €1.5 billion, which supports MSMEs across the southern Mediterranean region of the Middle East and North Africa.[597]

This contributes significantly to job creation and economic growth in the region by improving access to finance.

The European Bank for Reconstruction and Development (ERBD) also invests extensively in blue economy sectors in MENA countries through various initiatives, such as the Global Environment Facility (GEF) Clean and Healthy Ocean Integrated Program. This Program has created US$115 million in grants to help countries advance their environmental, economic, and social wellbeing in large marine ecosystems.

It builds on the Blue Mediterranean Partnership and Clean Oceans Initiative of which the EBRD takes part. The EBRD is also a signatory to the Sustainable Blue Economy Finance Principles and coordinates investment and financial aid in line with those principles.

The World Bank Group (WBG) is another prominent MDB with a role in the development and promotion of the blue economy. The World Bank has promoted PROBLUE, a Multi-Donor Trust Fund housed at the World Bank which supports the development of integrated, sustainable, and healthy marine and coastal ecosystems and resources worldwide.

592 European Investment Bank (2024) Clean oceans and the blue economy: Overview
593 Ibid
594 European Investment Bank (2024) Press release - EU Blue Champions unveiled: 20 companies will receive advisory support to grow their business.
595 European Commission (2023) News - InvestEU: €28 million for the first Blue Economy Instrument in Portugal
596 European Investment Fund (2024) News - EIF supports Blue Revolution Fund in boosting sustainable agriculture investments backed by the InvestEU programme
597 European Commission (2024). EU Initiative for Financial Inclusion

PROBLUE have committed more than US$200 million in grants for projects related to sustainable fishing and aquaculture, integrated management of coastal and marine ecosystems, circular economy and better management of marine pollution, sustainable coastal tourism, maritime transport, and renewable energy.[598]

Finally, the African Development Bank is providing extensive funding to develop climate resilience and to promote ocean-based activities and infrastructures in North African Countries.

The African Natural Resource Centre and Sustainable Energy Fund for Africa, operated by the Bank, are actively supporting offshore renewable energy projects and other blue economy sectors to enhance economic growth and environmental sustainability in the region.

Private investment

A great number of private sector initiatives have emerged which mostly target SMEs and start-ups in the blue economy. An analysis of private equity and venture capital funds focused on the blue economy shows diversification in terms of strategy and capital sources. Some funds are backed by major institutional investors such as the EIB and EIF, gaining a global presence and recognition, whilst others have attracted mostly private sources of capital.

Some examples of key Private Equity/Venture Capital funds with a clear and distinctive Blue Economy focus have been identified by the BlueInvest Investor Report 2024.[599]

Among others, the report highlights Katapult Ocean[600] (€75 million), SARSIA[601] (€75 million), or Ocean 14 Capital Fund[602] (€200 million).

There has also been an expansion in the number and diversity of financial vehicles related to the blue economy in recent years due to changes in investor preferences.

Blue loans are an established financial instrument which raises and designates funds for sustainable investment in blue sectors. As a relatively new financing instrument, practitioner guidelines were developed by the IFC in 2023 in cooperation with the ICMA, UN Global Compact, ADB and UNEP-FI.

Blue loans have led to an increase in blue funding by EU banks and have supported them in developing portfolios of blue loans to finance the blue economy transition. Recent guidelines from the ICMA also place significant emphasis on ocean-based marine ecosystems which are relevant for numerous EU countries.

Finally, **blended finance** has been utilised to increase private sector investment in sustainable development using catalytic capital from public or philanthropic sources.

This is an especially opportunistic source of financing for sustainable ocean businesses that are categorised as high-risk. Different models, such as direct subsidies, concessional or preferential loans, loan guarantees and first loss facilities, are used within blended finance.

A dedicated blended finance instrument exists for the blue economy under InvestEU, which launched in 2022 and is supported by the EMFAF and EIB to provide equity funding for blue economy start-ups and SMEs. The Blue Mediterranean Partnership is seeking additional financing from sovereign donors for project preparation and blended finance.[603]

Overall, private investors are more aware of sustainable ocean-related opportunities, but to scale up this awareness and interest, enabling conditions must be strengthened.

This includes improving awareness of investment opportunities, increasing stakeholder recognition, improving dialogue, and strengthening the synergies between public and private finance in the case of blended finance to align with existing strategies and actions to include environmental and social indicators and measures.

Box 10 Blue Bonds: a new innovative financing instrument

Blue bonds have emerged as an innovative instrument in the financing of the sustainable blue economy. These are debt instruments which mobilise private sector capital in order to finance marine and ocean-based projects to obtain positive environmental and social benefits. According to BlueInvest, the Europe, Middle East and Africa (EMEA) region has accounted for 2% of total cumulative volume of blue bonds since 2018 compared to other worldly regions.

They have received significant attention from investors and financial institutions, however there is currently a lack of universal frameworks or a robust pipeline of bankable investments which pose a barrier to their use in achieving a sustainable blue economy.

Source: BlueInvest Report, Blue Bonds report

598 elPeriódico (2024) News article - Marine resources contribute 3% to global GDP
599 BlueInvest (2024) Investor Report: Unlocking the potential of the Blue Economy
600 More information at: https://katapult.vc/ocean/
601 More information at: https://sarsia.com/
602 More information at: https://ocean14capital.com/
603 More information at: https://medblueconomyplatform.org/wp-content/uploads/2024/07/Blue-Mediterranean-Partnership-BMP-260624-2.pdf

Box 11 Investment in the sustainable blue economy: incubators & accelerators

Venture capitalists and incubators/accelerators provide a strong support base for start-ups in the blue economy across a range of sectors. For biotechnology, incubators and accelerators represent over 40% of the investor base and are also prominent in the renewable energy landscape. In blue tech and ocean observation, more than half of investors are incubators/accelerators and venture capitalists, The figure stands at 20% for shipbuilding.

In May 2022, the National Hub of Italy, via the WestMED initiative, identified a range of blue incubators and accelerators within the region. The theme of the event was bridging gaps between accelerators, investors, and funding institutions on the one hand, and promising BE initiatives on the other hand. Several prominent incubators and accelerators were identified:

FAROS Blue Economy Accelerator is the first Italian Blue Economy accelerator dedicated Italian and international startups operating in the field of blue economy, maritime and port innovation, resources and marine ecosystem protection. It operates via two territorial hubs, Taranto and La Spezia. The call for startups is currently open for both hubs.

The **ENTOPAN Harmonic Innovation Hub** is a multidisciplinary centre which services the MEDiterranean area and is focused on the development and training of new skills, valorisation of young talent, leadership and supporting startups and SMEs in the blue economy space.

LEANCUBATOR is an incubator and innovation hub in Algeria which specialises in supporting sustainable and innovative projects in multiple sectors including the blue economy as well as green economy, foodtech, and fintech. It has supported over 350 startups and innovative projects.

The Algeria Startup Challenge is the largest startup program in Algeria which creates opportunities for startups and companies to boost innovation. Launched in 2018, it was voted the best programme for skills development and innovation support in the field of blue economy in the Western Mediterranean at WestMED 2021. It is currently in its 6th edition.

BUSINESSMED is the main representative of the private sector which reflects the interests of 25 Confederations of Enterprises from member states of the UfM. It focuses on business, dialogue, regional integration and policy and institutional reforms. Through services to members and entrepreneurs it aids in creating an enabling investment environment for MEDiterranean SMEs operating in the blue economy.

Additionally, the Mediterranean Blue Acceleration Network (MedBAN) aims to mobilise EU blue economy SMEs to adopt greener and digitalised processes and technologies via two open call schemes to fund a set of services for SMEs on innovation, training, transformation and internationalisation issues.

It has a total budget of €1.4 million. **MedBAN** will publish results by the beginning of September 2024, with the conclusion of the initiative in October.

Lastly, **POLIHUB** and **DIGICIRC** are online startup accelerators which bring together startups, companies, experts, institutions, and investors to cultivate and support new business ideas and opportunities which aim to make the economy more sustainable, with particular focus on the sustainable blue economy.

GOVERNANCE OF THE SUSTAINABLE BLUE ECONOMY

INTRODUCTION

A wide variety of governance structures and institutional frameworks can be identified in the Mediterranean region. This ecosystem of organisations, international associations or collaborative networks can be found both t a regional and sub-regional level and comprises virtually all relevant blue economy related sectors.

This wide variety of institutional frameworks translates into the identification which has been done for the purpose of the 3rd Edition of the Publication, of more than 20 organisations operating in the Mediterranean, these being organisations operating both at a regional and sub-regional level. They include very different profiles and dynamics of cooperation, as it is described in the sections below.

The 2021 UfM Ministerial Declaration on Sustainable Blue Economy

Regarding the topic of governance and the 2021 UfM Ministerial Declaration on SBE, four specific calls for further action were included:

1. Firstly, the Declaration calls to increase the number of opportunities for exchange of experiences and best practices, as well as cooperation between the countries of the Mediterranean region, maximizing the potential of the two sub-regional initiatives (WestMED and EUSAIR) and encouraging the involvement of other UfM countries in relevant activities.
2. The Declaration also calls on relevant Managing Authorities and participating countries to further enhance synergies between future Interreg programmes and other European Union funds, aligning them to the extent possible to address the needs of the whole region whilst avoiding double funding, and promoting their contribution to the achievement of policy objectives set out either in the UfM context, or within the context of agreements between the European Union and third countries, or within the context of other regional cooperation agreements;
3. As a third call for action, Ministers encourage the engagement of all the relevant national and local authorities.
4. Finally, the Declaration calls on other donors to further support the fruitful cooperation in the region and complement the ongoing and future actions, as possible and opportune.

For the latter, organisations such as the World Bank and the European Bank of Reconstruction and Development should be taken into consideration, together with the African Development Bank. All three of them include in their portfolios blue economy related projects, especially in the case of the World Bank, which is already quite active in northern Africa in this context.

Additionally, the UfM dossier integrates a participatory mechanism into its governance framework to promote collaboration amongst stakeholders. This ensures that the development of the blue economy in the region are inclusive and draw upon a wide range of diverse perspectives and expertise of various actors, including national governments, regional and local authorities, civil society, academic institutions and the private sector.

The UfM has continued to provide structural support to the governance of the Sustainable Blue Economy approach at regional level. As a key milestone, the UfM EU and Jordan Co-Presidency, the UfM member countries, the UfM Secretariat and Mediterranean stakeholders gathered together at the 2nd UfM Stakeholder Conference on Sustainable Blue Economy in Athens on 19-20 February 2024 to exchange on the knowledge-base, best practices, and advancements related to the implementation of the 10 priority areas of work agreed by the 43 MEDiterranean countries within the 2021 UfM Ministerial Declaration on Sustainable Blue Economy. The conference acted as a governance 'living lab', with 11 thematic and multi-stakeholder workshops whereby substantial feedback on the progress in the implementation of the SBE approach in the Mediterranean was gathered.

With regards to governance, and to identify potential avenues for future cooperation in the governance field, the two following aspects can be underlined:

- It needs to be acknowledged that, as underlined above, there is already an existing rich and quite comprehensive ecosystem of governance structures both at regional and sub-regional level.
- This leads to the assumption that most of the future avenues of actions will need to be linked to the search for further synergies and complementarities among the existing organisations and frameworks of regional cooperation operating in the sea basin (rather than the creation of new ones).

As part of the participatory mechanism, the Union for the Mediterranean Regional Platform on Sustainable Blue Economy (SBE) represents an instrumental platform for the development of the blue economy in the Mediterranean:

Box 12 The Union for the Mediterranean (UfM) Regional Platform on Sustainable Blue Economy (SBE)

The Union for the Mediterranean (UfM) Regional Platform on Sustainable Blue Economy (SBE), formerly known as the UfM Working Group on Blue Economy, convenes on a regular basis - at least twice a year - in order to guide and support the implementation of the UfM Ministerial Declarations on Blue Economy that have been endorsed by the 43 member countries of the UfM. Additionally, the Platform oversees the Roadmap for the implementation of the 2021 UfM Ministerial Declaration on SBE.

Co-chaired by the UfM Co-Presidency with the assistance of the UfM Secretariat, the Platform includes national representatives designated by the UfM member countries (UfM Focal Points on Sustainable Blue Economy) as well as Permanent Observers. Its primary objectives are to:

1. Develop and execute the regional SBE agenda and portfolio in alignment with Ministerial recommendations and priorities.
2. Foster synergies among existing and emerging joint initiatives, projects, and programs, and promote convergence and the coordination of efforts at regional level.
3. Facilitate the exchange of information, perspectives, best practices, and expertise among countries, experts, and stakeholders.

To date, 15 meetings of the Regional Platform have taken place. Detailed information and outcome materials of each meeting are available here on MedBESP.

14th meeting of the UfM Regional Platform on SBE, UfMS premises – Barcelona, 11 October 2023
Source:UfM

At regional level

Central to this ecosystem and with a holistic approach towards governance in the Mediterranean 2 key organisations can be identified: The **Union for the Mediterranean (UfM)**[604] and the **Maghreb Arab Union (MAU)**,[605] which is a cooperation initiative based on the Marrakech Treaty (1989) between Mauritania, Morocco, Algeria, Tunisia and Libya (Southern members of 5+5) aiming to support "common policy in all the domains".

It is also important to note when referring to the Union for the Mediterranean that this organisation **labelled the Interreg MED Programme's approach towards governance.**

The approach is based on a new typology of governance projects, particularly Thematic Community Projects and Institutional Dialogue Projects. The UfM label has recognised the dialogue-based governance approach of the Interreg MED as a relevant provision to support a better governance of the Mediterranean and contribute to climate neutral and resilient society.

In addition, the UfM label facilitates the institutional dialogue among all actors while deepening and expanding the effective exchange and transfer of mutual relevant results.

Thanks to the label, the institutional dialogue sought by the Interreg MED programme will reach both shores of the Sea.

In parallel to the 2 key inter-governmental frameworks identified above, the following should also be listed when dealing with a better governance and reinforcing the dialogue among different levels of government and stakeholders:

ARLEM (MEDiterranean Regional and Local Assembly):[606] An assembly of local and regional elected representatives from the European Union and its Mediterranean partners which was set up in 2010 by the European Committee of the Regions, allowing elected representatives from the three shores of the Mediterranean Sea to represent their local and regional authorities politically, maintain political dialogue and promote interregional cooperation

CPMR Mediterranean Commission:[607] It gathers around 40 Member Regions from 9 different EU members states and other countries (Albania, Cyprus, France, Greece, Italy, Malta, Morocco, Spain and Tunisia).

It is open to all the different sub-national levels in all Mediterranean countries and focuses on the development of the MEDiterranean dialogue and territorial cooperation, concentrating its efforts on Transport and Integrated Maritime Policy, Economic and Social Cohesion, Water and Energy.

MED CITIES:[608] is a network which helps empower Mediterranean local governments to achieve their strategic priorities, believing them to play a vital role in improving the lives of citizens.

It is a Mediterranean voice for local authorities and builds their capacity to meet the challenges of local governance in a sustainable way.

It has four principal fields of activity: developing and implementing projects; sharing knowledge and building expertise in local authorities; facilitating cooperation and multilateral action between municipalities and metropolitan areas; participating in regional and international political processes.

Interreg MED has launched three calls for project proposals targeting the third priority of the Programme "Mediterranean Governance", Specific Objective (SO) 6.6 "Other actions to support better cooperation governance."

In this framework, and after the closure of the PANORAMED[609] project, several follow-up projects fostering institutional dialogue and governance in the MEDiterranean region across thematic missions have recently been approved (GOV4MED -focusing on tourism as previously mentioned-, Go4Med Nature, in line with the mission on protecting, restoring and valorising the natural environment and heritage, and EUCLID, which aims at promoting green living areas).[610]

Addressing 'Governance' at the level of **programmes and projects**, the **Interreg MED programme 2021-2027** has approved since 2023 new "governance" projects. These include the Community4 projects, such as Community4Innovation[611] which focuses on bolstering the innovative sustainable economy (ISE) in the Mediterranean region by developing and enhancing capacity for research and innovation.

604 More information at: https://ufmsecretariat.org/
605 More information at: https://au.int/en/recs/uma
606 More information at: https://cor.europa.eu/en/our-work/Pages/ARLEM.aspx
607 More information at: https://cpmr-intermed.org/
608 More information at: https://medcities.org/es/
609 More information at: https://governance.interreg-med.eu/
610 More information at: https://interreg-euro-med.eu/en/call-3-the-final-results-are-out/
611 More information at: https://keep.eu/projects/27706/Mediterranean-innovation-su-EN/

Community4Nature[612] aims to establish a Community of Practice (CoP) for coordination among different levels of knowledge and policy in order to approach the challenges faced by biodiversity protection and adaptation and mitigation to climate change in the region.

Community4Tourism[613] focuses on contributing to territorial cooperation on tourism within the Mediterranean region, especially through enhancing the outlook of sustainable tourism.

There are also the Dialogue4 projects, such as Dialogue4Innovation[614] which also aims to contribute to a more innovative and sustainable economy in the region, and Dialogue4LivingAreas[615] which takes on a holistic approach to creating green living areas in the Mediterranean through promotion of energy efficiency, citizen energy communities, sustainable urban transport, sustainable waste and water management and the development of urban agriculture, among other objectives.

The Dialogue4Nature[616] project works to establish a Mediterranean Resilience Network (MRN) which will coordinate cooperation on a regional level through coordination on climate change, biodiversity and the achievement of policies conducive to sustainable development.

Lastly, the Dialogue4Tourism[617] project aims to increase the coordination and institutional capacity on a various institutional levels across the Mediterranean in order to transform the regional approach to tourism to be greener, smarter and more resilient.

Finally, the **Sustainable Blue Economy Partnership (SBEP)**[618] constitutes an unprecedented effort to pool research and innovation investments and align national programmes at pan-European scale, including the Mediterranean basin.

Marine policies, sustainability and the blue economy

As regards marine policies, sustainability and the blue economy, several pivotal frameworks in the Mediterranean can be identified.

The **Roadmap for the implementation of the 2021 UfM Ministerial Declaration on Sustainable Blue Economy** adopted in 2022 is a critical framework to advance SBE development in the Mediterranean.

It emphasises collaboration among UfM member states in order to promote the Sustainable Development of the sectors and activities of the Med SBE in line with each of the 10 priorities of the 2021 Ministerial.

The Roadmap outlines concrete actions and projects to be launched and scaled-up from the short to the longer term in order achieve these goals, ensuring an integrated, multi-stakeholder, and coordinated approach to harnessi the potential of the Mediterranean sustainable blue economy.

1. Governance and the future of sea basin strategies in the Mediterranean region
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 investments in the blue economy

The **Mediterranean Strategy for Sustainable Development (MSSD)** 2016-2025,[619] which provides an integrative policy framework for all stakeholders, 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.

The Regional Action Plan for Sustainable Consumption and Production in the Mediterranean (SCP) is a forward-looking framework to complement and work in full synergy with existing national and regional policy frameworks, and to support the implementation of the Barcelona Convention and its Protocols.

The SCP Action Plan supports the implementation of the 2030 Agenda for Sustainable Development and is structured around four key economic sectors for the region, (i) food, fisheries and agriculture, (ii) goods manufacturing, (iii) tourism, (iv) housing and construction.[620]

Progress on the Regional Action Plan on Sustainable Consumption and Production in the Mediterranean (2016 – 2027) is measured using a set of SCP indicators that were selected among existing international indicators or new indicators for the Sustainable Development Goals (SDGs).

612 More information at: https://www.conisma.it/it/community4nature-project/
613 More information at: https://planbleu.org/en/projects/community-4-tourism/
614 More information at: https://www.adriaticionianeuroregion.eu/projects/dialogue4innovation/
615 More information at: https://keep.eu/project-ext/27709/
616 More information at: https://keep.eu/projects/27712/Dialogue4Nature-the-Institu-EN/
617 More information at: https://keep.eu/projects/27710/Dialogue4Tourism-Institutio-EN/
618 More information at: https://bluepartnership.eu/
619 More information at: https://www.unep.org/unepmap/what-we-do/mediterranean-strategy-sustainable-development-mssd
620 More information at: https://www.obs.planbleu.org/en/action-plan-on-scp/

Indicators and the Mediterranean Sustainability Dashboard are available at the Mediterranean Observatory on environment and sustainable development managed by Plan Bleu.[621]

During the 2020-2021 period, also at the request of COP21, the list of SCP indicators was reviewed, its database was updated, and fact sheets were prepared for each of the selected indicators with the support of SwitchMed II.[622]

The **General Fisheries Commission in the Mediterranean (GFCM)**[623] 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.

In parallel to these three central elements to marine and sustainability policies in the Mediterranean Sea basin, the following are also play an important role in their respective fields of activity:

MedWet:[624] the Mediterranean Wetlands Initiative brings together 27 Mediterranean and peri-Mediterranean countries that are Parties to the Convention on Wetlands.

The MedWet mission is to ensure and support the effective conservation of the functions and values of Mediterranean wetlands and the sustainable use of their resources and services.

Ramsar decisions support MedWet by recognizing it as vital for Mediterranean wetland conservation, urging the development of regional strategies, securing funding, enhancing capacity building, and fostering collaboration with other organizations. They also emphasize the importance of monitoring, public awareness, and education initiatives.

MedPAN:[625] The network's mission is to promote, through a partnership approach, the sustainability and operation of a network of marine protected areas in the Mediterranean which are ecologically representative, connected and effectively managed to help reduce the current rate of marine biodiversity loss.

This is facilitated by the MedPAN strategy,[626] which is designed to provide direct technical support to MPA managers at the local level through targeted expertise-sharing programs, capacity building and improving knowledge as the implementation of joint actions in favour of threatened ecosystems. Raising awareness and communication for the implementation of policies and funding for MPA management is also included in the strategy.

PIM Initiative:[627] This is an international NGO for the promotion and assistance in the management of mediterranean insular areas.Its objective is the preservation of these micro-areas through the implementation of concrete actions in the field, by promoting the exchange of know-how and knowledge between conservationists and specialists in the Mediterranean basin. Its approach gives priority to simple and pragmatic solutions.

The IUCN Centre for Mediterranean Cooperation:[628] This is an environmental organisation devoted to promote sustainable livelihoods and biodiversity conservation through cooperation and shared values and culture.it is the only environmental organisation with observer status at the United National General Assembly.

The **Mediterranean Lighthouse** (BlueMissionMED CSA) in the framework of the EU Mission Restore our Oceans and Waters has been established as a new horizontal support structure to support the implementation of the Mission objectives in the Mediterranean basin.[629]

As part of the participatory mechanism, two instrumental platforms/tools can be identified which serve the development of the blue economy in the Mediterranean:

- **The Mediterranean Blue Economy Stakeholder Platform**,[630] a regional networking platform for sharing knowledge and supporting the development of the blue economy, which is the largest "one-stop-shop" for general, technical and sectoral information related to marine and maritime affairs in the Mediterranean, and
- **The European Maritime Spatial Planning Platform**,[631] an information and communication gateway designed to offer support to all EU Member States (including the Mediterranean ones) in their efforts to implement Maritime Spatial Planning (MSP) in the years to come.

621 More information at: https://www.obs.planbleu.org/en/action-plan-on-scp/
622 More information at: https://switchmed.eu/policy/monitoring-progress-on-the-regional-action-plan-on-scp-in-the-mediterranean/
623 More information at: https://www.fao.org/gfcm/en/
624 More information at: https://medwet.org/
625 More information at: https://medpan.org/
626 More information at: https://medpan.org/en/strategy
627 More information at: http://initiative-pim.org/index.php/en/home/
628 More information at: https://www.iucn.org/regions/mediterranean
629 More information at: https://bluemissionmed.eu/
630 More information at: https://medblueconomyplatform.org/
631 More information at: https://maritime-spatial-planning.ec.europa.eu/

At subregional level

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."

Also from a more sub-regional perspective, the WestMED Maritime Initiative and the EUSAIR: European Union Strategy for the Adriatic and Ionian region (Pillar 1 Blue Growth) offer dedicated collaborative frameworks which bring together national and regional authorities with the wider blue economy communities:

WestMED initiative:[632] The European Commission launched the initiative for the sustainable development of the blue economy in the Western Mediterranean region in 2017.

The objectives of the WestMED Initiative are to establish a safer and more secure maritime space; a better governance of the seas; and a smart and resilient blue economy.

On 23 June 2023, following the countries' reports and the EC report evaluating the WestMED Initiative's implementation so far,[633] that listed as one its main recommendations to 'reconfirm and streamline priorities', Ministers and high-level representatives from the 10 WestMED countries met in Malta together with representatives of the European Commission and the Union for the Mediterranean to reassess and update the priorities stated in the WestMed Framework for Action as supported by the WestMED Initiative.

In this framework, the countries renewed and adjusted their commitments on a **new 2023 WestMED Ministerial declaration**,[634] streamlining the WestMED Framework for Action priorities to focus on:

- Sustainable production and consumption, and in particular, through the support of the transition of Maritime Transport, Green shipping, and Ports towards carbon-neutrality and zero emission and ports as hubs for energy; Innovative and restorative aquaculture and fisheries and Coastal and maritime eco-Tourism.
- Maritime Clusters
- Blue skills and jobs
- Ocean literacy and youth
- Promoting Maritime Spatial Planning (MSP)
- Decarbonisation of the blue economy and, importantly, boosting the Marine Renewable Energy sectors
- Stepping up the efforts to tackle air and marine pollution
- Increasing ambition for preserving marine and coastal biodiversity in the Mediterranean
- Promoting training and technology transfer
- Developing coastal resilience solutions and early warning systems
- Maritime security and surveillance as a pre-condition for a prosperous and sustainable blue economy in the Mediterranean.

EUSAIR:[635] The EU Strategy for the Adriatic and Ionian Region is a macro-regional strategy adopted by the European Commission and endorsed by the European Council in 2014.

The Strategy was jointly developed by the Commission and the Adriatic-Ionian Region countries and stakeholders, which agreed to work together on the areas of common interest for the benefit of each country and the whole region. Its Pillar 1 focuses on Blue Growth Topic 1 – Blue technologies; Topic 2 – Fisheries and aquaculture; Topic 3 – Maritime and marine governance and services).

632 More information at: https://westmed-initiative.ec.europa.eu/
633 European Commission (2023) REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the implementation of the Western Mediterranean initiative
634 WestMED (2023) Declaration of the meeting of the ministers of the countries participating in the initiative for the sustainable development of the blue economy in the Western Mediterranean
635 More information at: https://www.adriatic-ionian.eu/

MARITIME SPATIAL PLANNING AND INTEGRATED COASTAL ZONE MANAGEMENT

INTRODUCTION

The 2021 UfM Ministerial Declaration on Sustainable Blue Economy highlights the importance of ecosystem-based Maritime Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) as essential tools and enablers to facilitate the sustainable development of maritime and coastal activities in the Mediterranean, with ICZM being integrated within MSP in order to ensure greater synergies through the land-sea interaction principle.

Furthermore, in the framework of the Roadmap for the implementation of the 2021 Ministerial, UfM countries have chosen to prioritize MSP as an 'immediate/short-term' priority due to its cross- cutting potential and role as cross-sectoral enabler.

The UfM Ministerial Declaration addressed the need to support greater uptake of Maritime Spatial Planning and Integrated Coastal Zone Management in order to ensure a fully sustainable blue economy in the Mediterranean and address an increasing competition for marine and coastal space and resources. In particular, the Declaration recognises some specific elements for consideration:

- Invites all countries to further use Maritime Spatial Planning in support of the development of the sustainable blue economy in the Mediterranean, including by addressing Land-Sea Interactions;
- Calls for their further development and update of ICZM national strategies, when necessary, through the provision of adequate financial and technical support, as well as for further involvement and coordination of national and local authorities on MSP/ICZM as appropriate.

Recently in Athens,[636] **Mediterranean stakeholders** recognised that MSP Directive and its associated framework and tools are now considered to be relevant policy instruments to plan economic activities at sea while considering environmental and social impacts, also on the Southern/Eastern shores of the Mediterranean. The 2021 UfM Ministerial Declaration on SBE and the 2023 WestMED Ministerial confirm that MSP is one of the key priorities on which Mediterranean countries wish to work, exchange, and establish cooperation upon.

So as to make good use of the available marine space, both Integrated coastal zone management (ICZM) and MSP can support planning decisions, considering interactions between economic activities at sea and the impact of land-based activities on coasts and waters, integrating a concern for preserving biodiversity and mitigating the impact of our activities upon the environment.

636 UfM (2024) 2nd UfM Stakeholders Conference on sustainable blue economy- Available at: https://medblueconomyplatform.org/wp-content/uploads/2024/03/2nd-ufm-sk-conf-sbe-outcomes-main-messages.pdf

OVERVIEW

In light of the increasing competition for the use of marine and coastal space and resources in the Mediterranean, MSP/ICZM can play an important role in strengthening cross-border cooperation and promoting co-existence; protecting the environment (i.e. through assigning protected areas, assessing negative impacts on ecosystems, and identifying opportunities for multiple uses of space); and encouraging investments through increased predictability, transparency, and legal certainty.

When establishing and implementing ecosystem-based MSP, the aim is to ensure that the collective pressure from all activities is kept within levels compatible with the achievement of good environmental status and healthy ecosystem services, thus promoting the sustainable development of maritime and coastal economies and the sustainable use of marine and coastal resources.

The application of the ecosystem-based approaches should be adapted to the different contexts, taking also into consideration the ongoing work in the framework of the relevant Regional Sea Conventions.

The allocation of maritime space for increasing marine renewable energy production as well as regional co-operation between EU Member States is essential - maritime spatial planning plays a key role in this regard.

Besides the legal requirements laid down in the MSP Directive, it is therefore necessary for Member States to reflect in their Maritime Spatial Plans the ambition of the European Green Deal's objectives and energy and climate plans, alongside established activities and interests.

EMFAF support to Maritime Spatial Planning Projects continues to cover the needs of EU Member States in the implementation, monitoring and revision of their maritime spatial plans, as well as to support the cross-border cooperation and combined efforts of countries at sea-basin level to tackle the targets under the European Green Deal and the above-described initiatives.

The regional dimension of MSP is crucial as to tackle the shared challenges facing our seas, and of the Mediterranean ecosystem. MSP is indeed also a useful instrument where applicable.

The energy transition and the ecological transition (biodiversity targets, processes to establish and manage MPAs, etc.) requires us to shift towards new ways of thinking and planning, whereby multi-use and co-use, cumulative impacts, ecosystem-based MSP and climate change will need to be considered.

For MSP to be successful in practice, learning from each other's experiences; dialogue across sectors and borders; involving all stakeholders at national, sub-national and local levels; and engaging coastal communities is crucial to ensure that policy decisions are understood and accepted, and that co-decision processes are put into practice.

As ICZM, MSP and the establishment of Marine Protected Areas (MPAs) share the same DNA as area-based approaches, the integration of planning for MPAs as part of the MSP process was identified as essential. Including marine conservation tools within MSP was identified as a key pathway to allow for integrated planning, and for synergies and coherence beyond the borders of zones and countries.

Additionally, the consideration of multiple sectoral needs and local interests, balancing sustainable economic goals and environmental needs for protection/restoration requires early engagement of stakeholders in the planning process.

The importance of bridging the knowledge-gap between academia/science and (national, sub-national and local) authorities was also stressed.

A science-policy dialogue around MSP and a better integration of different legal instruments (i.e. MSP – MSFD) can help to enhance policy coherence and further ensure a true multidisciplinary approach to planning in the Med, where applicable.

Towards these efforts and in the context of the existing EU policy framework and the broader political will to advance the MSP process in the Mediterranean, the WestMed Initiative with the support of the EU MSP Platform have supported the establishment of an enlarged Mediterranean MSP Community of Practice (MED-MSP-CoP).

The MSP, supported by the UfM, CoP is a voluntary expert group bringing together EU and non-EU countries working on MSP in the Mediterranean, with main objectives of establishing a permanent dialogue across borders between MSP experts (i.e. planners, technical experts, researchers), and exchanging knowledge and experiences in the region, aiming towards a shared and common perspective on MSP, and enhancing cooperation at basin level.

CROSS-CUTTING THEMES

Figure 32 Land Sea Interactions and MSP as "described" during the Mediterranean Green Week in Istanbul

Source: Own - photo from the screen during the Mediterranean Green Week in Istanbul (2024)

Current MSP status across the Mediterranean

In order to assess the state of play of MSP across the Mediterranean region is important to acknowledge the differences persisting across countries in the east and west sides of the sea basin.

Moreover, a lack of a dedicated common policy framework across EU and Northern African Mediterranean countries prevents regional MSP approach. Give such lack of framework current dynamics remain largely polarised, so far, between eastern and westerns countries.

Particularly countries in the eastern side of Mediterranean encompasses a diverse and geographically complex cluster, including the Adriatic, Ionian, Aegean, and Levantine Seas, each with its unique characteristics and challenges.

From the Adriatic Sea, separating the Italian and Balkan peninsulas, to the deep soundings of the Ionian Sea, reaching depths of up to 16,000 feet, and the Aegean Sea, boasting over 700 islands and islets, this area is rich in natural resources and biodiversity.

Bordered by a multitude of countries, both EU and non-EU, including Italy, Greece, Cyprus, Türkiye, Syria, Lebanon, Egypt, Israel, Palestine and Libya, the eastern Mediterranean countries face various transboundary issues.

These include the potential exploitation of submarine natural gas and oil resources, the imperative for environmental conservation, crucial for sustaining coastal tourism - a major economic driver in the region, and the urgent need for collaboration in ensuring maritime safety amidst the ongoing migratory crisis.

These shared challenges underscore the importance of coordinated maritime spatial planning efforts across borders to promote sustainable development and address pressing environmental and socio-economic concerns.[637]

Cooperation among Member States in the eastern Mediterranean region has been facilitated through various initiatives and projects aimed at promoting MSP and addressing common challenges. Initiatives such as the EU Strategy for the Adriatic and Ionian Region (EUSAIR) and EMFAF projects like REGINA-MSP, MSP-GREEN, and MSP-MED have aimed at fostering collaboration and coordination in activities related to Blue Economy and marine environment protection.

Additionally, projects like THAL-CHOR I and THAL CHOR II INTERREG Projects, ADRIPLAN, and SUPREME have contributed to cross-border cooperation for MSP development in the region.

On the other hand, countries on the western side of Mediterranean such us Spain, France, Malta, Morocco, Tunisia, Algeria and the Italian coastlines along the Tyrrhenian Sea and Strait of Sicily, serving as a crucial maritime corridor, boast a vibrant tourism industry and substantial fisheries and aquaculture sectors. Significant goods transport occurs, comprising almost 40% of Mediterranean traffic. Human activities in the western Mediterranean lead to high environmental pressures, including pollution and habitat loss.

637 East Mediterranean | The European Maritime Spatial Planning Platform (europa.eu)

Overexploitation of fishing resources and biodiversity decline are key concerns.

Cross-country collaboration has been needed to address these challenges and promote sustainable development.

Efforts for MSP cooperation in the western Mediterranean region have been bolstered by initiatives led by organizations like UNEP/MAP and the IMP-MED working group.

Projects such as SIMWESTMED, WESTMED Assistance Mechanism, MSP-MED, AMPAMED and the IOC-UNESCO MSP Global have furthered cross-border cooperation in the region. Türkiye, for example, recently launched its Blue Plan 2053 for marine areas around Türkiye, and its "Blue Plan Guideline" and "MSP Guidelines" are also under completion.

In contrast to eastern Mediterranean countries that are yet to finalize their national MSP plans, the western Member States countries have made considerable progress.

France, for instance, has adopted four maritime spatial plans known as the Documents Stratégiques de Façade (DSF) between April and May 2022, each tailored to a specific marine subdivision.

Similarly, Spain adopted its MSP plan, the Planes de Ordenación del Espacio Marítimo (POEM), in February 2023, comprising five plans corresponding to its marine subdivisions.

Malta, having adopted its plan in 2015, is currently in the process of revising it to align with the EU MSP Directive and incorporate an ecosystem-based approach.

In 2019, the Plano de Situacão do Ordenamento do Espaço Maritimo Nacional (PSOEM) was adopted by Portugal. At last, Italy adopted its Maritime Space Management Plans on 25th of September 2024.

Box 13 MSP national plans status

Croatia - MSP process ongoing
Cyprus - MSP adopted in 2023
Greece - MSP process ongoing
Slovenia - MSP adopted in 2021
France - MSP adopted in 2022
Italy - MSP adopted in 2024
Malta - MSP adopted in 2015
Portugal - MSP adopted in 2019
Spain - MSP adopted in 2021

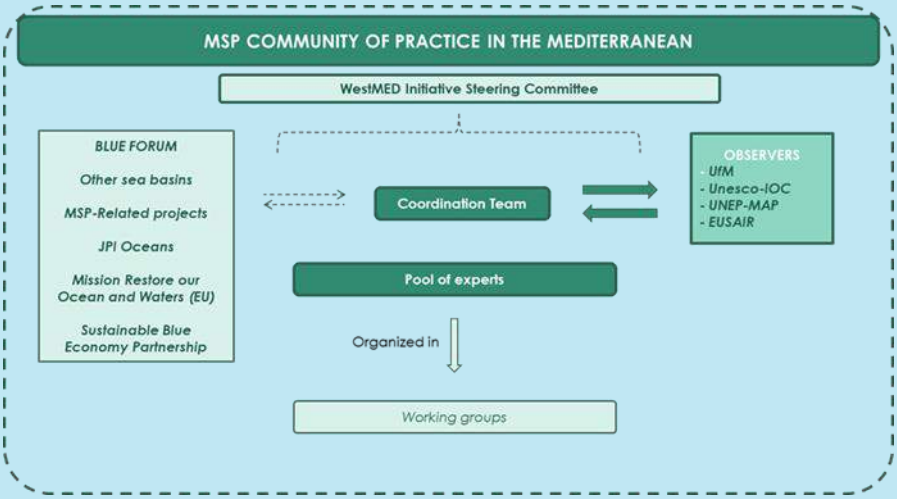
Box 14 MED – MSP Community of Practice (MED-MSP-CoP)

On January 26th, 2023, CINEA and DG MARE officially launched the MED-MSP-CoP during a kick-off meeting in Brussels where the experts discussed the structure and the action plan for the next year. The main objective of the MED-MSP-CoP is to reach a shared perspective on topics of common interest on MSP and enhance the cooperation between the north and the south of the Mediterranean. The MED-MSP-CoP support MSP and MSP-related processes by examining useful practices and tools and being a place for exchanges to develop common language and suggesting coherent and harmonized approaches for using MSP as an enabler to a more sustainable blue economy and to improve protection of the marine environment.

Additionally, the MED-MSP-CoP formulates and provide recommendations that can support regional cooperation for MSP and, at the same time, national processes and decision making on the implementation of MSP plans in WestMED countries, and beyond as applicable. This group of experts help to anticipate changes of use in the WestMED region and avoid conflicts related to these changes, in line with the UfM Blue Economy roadmap and as described in the Framework for Action of the WestMed Initiative. Although the MED-MSP-CoP was initially conceived to be focused on the Western Mediterranean, as part of the efforts put in the implementation of the UfM Blue Economy Roadmap, links with experts from the wider Mediterranean basin have been established.

The MED-MSP-CoP is composed of voluntary experts from EU and non-EU States, i.e. experts with technical knowledge on MSP issues and in good communication with decision-makers and planners involved in MSP process.

Figure 33 MED-MSP-CoP structure



Source: Own (2024)

Box 14 MED – MSP Community of Practice (MED-MSP-CoP) - Continued

The key elements framing the scope of the MED-MSP-CoP are:

- Given the existing EU policy framework and the broader political will to work on MSP, as expressed at UfM level for the Mediterranean, there is a shared interest in an "enlarged MSP-CoP". The MED-MSP-CoP is open for experts and observers around the Mediterranean, initially focusing on WestMED, and therefore UfM, areas of interest.
- Work on a multilevel approach (Mediterranean, sub-regional/WestMED, national and subnational) for MSP to ensure vertical integration, capitalising relevant on-going and upcoming initiatives, also to ensure the appropriate flow of information between the MED-MSP-CoP (building on the work of WestMED), and the UfM Working Group on Blue Economy (via its Focal Points), UNEP/MAP, MSP Global, BlueMed, and other regional and sub-regional initiatives.
- Establish links with other on-going and future MSP-related working groups (i.e. TEG on Data for MSP) and initiatives, as in particular the Blue Forum.
- Develop interactions and synergies with existing and upcoming MSP projects (e.g. REGINA, MSPGREEN, REMAP, eMSP-NSBR, Co-Evolve for Blue Growth, etc.).
- Ensure transfer of knowledge, good practices, tools, technics and research to planners and decision makers.
- Link with national and local actions related to MSP, ICZM and MPA in WestMED countries.
- Provide recommendations in relation to the most urgent/important emerging topics identified by the MED-MSP-CoP members and partners.
- Envisage exchanges with experts from other sea-basins.

As a continuation of the discussions started at the WestMED Hackathon organized by the WestMED Assistance Mechanism in Malta on June 30th 2022 regarding the creation of an open Community of Practice for exchange on MSP in the framework of the WestMED Initiative and after a couple of events organised in the frame of the MSPMED project in Tunis (September 2022, Pan-western Mediterranean workshop) and Rome (October 2022, Final Conference) specific objectives of the CoP and the Action Plan for the first year of its establishment have been decided.

Short term

- Creation of the Coordination Team of the MED-MSP-CoP formed by a core group of experts (voluntary basis) and design of the annual plan of actions;
- Formalization of the MED-MSP-CoP within the WestMED framework;
- Identification of experts to be involved in the MED-MSP-CoP;
- Stocktaking of ongoing and upcoming projects and initiatives regarding the priority topics identified by the MED-MSP-CoP;
- Stocktaking of future events to capitalize on for the organization of back-to-back meetings
- Identification of major gaps and needs;
- Establishment of informal connections with the national MSP processes and the MSP competent authorities.

Mid term

- Design of capacity building activities according to the identified gaps and needs and available funding and resources in the sea basin;
- Assessment of R&I as key driver to provide recommendations for MSP in the WestMED - and for the wider Mediterranean Sea as applicable - and the way to address them;
- Assess how to include the private sector and the NGOs in the MED-MSP-CoP, i.e. pool of expert or within specific working groups.

Long Term

- Collaboration on specific actions capitalizing on results of previous projects and project development on transboundary issues;
- Extension of the MSP-CoP to the entire Mediterranean

FUTURE (2025-2030)

The Kunming-Montreal Global Biodiversity Framework (GBF) was adopted during the fifteenth meeting of the Conference of the Parties (COP 15) following a four-year consultation and negotiation process.

This historic Framework, which supports the achievement of the Sustainable Development Goals and builds on the Convention's previous Strategic Plans, sets out an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050. Among the Framework's key elements are 4 goals for 2050 and 23 targets for 2030. The Framework has relevance and is applicable to all EuroMed countries.

Furthermore, on 11 December 2019, the European Commission presented the European Green Deal.[638]

It provides a roadmap with actions to boost the efficient use of resources by moving to a clean, circular economy and stop climate change, revert biodiversity loss and cut pollution. It outlines investments needed and financing tools available.

Because of its spatial dimension, MSP can act as a powerful enabler of the European Green Deal. This is the case for several initiatives launched in the context of the European Green Deal, such as the Biodiversity Strategy for 2030,[639] the Farm to Fork Strategy for sustainable food[640] or the EU strategy on offshore renewable energy.[641]

In May 2021, the Commission adopted a Communication on a new approach for a sustainable blue economy.[642]

MSP and the co-existence of multiple sectors is one of the components of this new approach.

With the new Biodiversity Strategy, the EU aims at increasing the network of marine protected areas and other effective conservation measures to reach 30% protection of the marine space by 2030.

It is further proposed that 10% of this network would be under strict protection, this for areas of high biodiversity value or potential. In 2022 the European Commission proposed a Nature Restoration law, that aims to restore 20% of ecosystems by 2030.

This may have an impact on maritime spatial planning as new areas for conservation and restoration will have to be identified.

The European Green Deal and the Farm to Fork Strategy underline the potential of farmed seafood as a source of protein for food and feed.

As part of the Farm to Fork strategy, the Commission adopted revised guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030.[643] Aquaculture also needs to have its presence in the Maritime Spatial Plans.

Regarding the EU strategy on offshore renewable energy, MSP has been explicitly identified as an essential and well-established tool to facilitate the development of offshore renewable energy in the EU in a sustainable way. Further decarbonisation of the energy system is essential to achieve the EU's climate objectives in 2030 and 2050.

In July 2024, Ursula von der Leyen published her Political Guidelines for 2024-2029 in which she announced a European Oceans Pact focusing on boosting the blue economy and ensuring the good governance and sustainability of our oceans in all of their dimensions. MSP will certain ly be part of this endeavour.

MSP & Ecosystem Based Approach

When establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to promote the coexistence of relevant activities and uses.

The application of an ecosystem-based approach will contribute to promoting the sustainable development and growth of the maritime and coastal economies and the sustainable use of marine and coastal resources.

The aim is to ensure that the collective pressure of all activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised.

638 More information at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
639 More information at: https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en
640 More information at: https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
641 More information at: https://energy.ec.europa.eu/topics/renewable-energy/offshore-renewable-energy_en
642 More information at: https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/european-commission-adopts-new-communication-sustainable-blue-economy-2021-05-17_en
643 More information at: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1554

An ecosystem-based approach should be applied in a way that is adapted to the specific ecosystems and other specificities of the different marine regions and that takes into consideration the ongoing work in the Regional Sea Conventions.

Maritime spatial planning is a tool to support the ecosystem-based approach to the management of human activities in order to achieve good environmental status of marine ecosystem.

In September 2021 CINEA and DG MARE published Guidelines for implementing an Ecosystem-based Approach in Maritime Spatial Planning. The document intended to describe a practical approach toward an Ecosystem-based Approach in Maritime Spatial Planning Including a method for the evaluation, monitoring and review of EBA in MSP. The guidance:

- presents an introduction to ecosystem-based concepts, principles and approaches.
- describes how work under the EU regulatory framework – including the MSFD – provides resources for EBA in MSP.
- presents a set of key actions to integrate EBA in the main steps of the MSP process.
- describes potential tools that can be applied as part of operationalizing EBA in MSP.
- provides an approach to monitor, evaluate and review progress in integrating EBA in MSP.
- Finally, the guidance illustrates recommendations with examples derived from MSP case studies as well as references for users to further explore when integrating EBA into MSP.

Main elements elements of EBA-based MSP should be considered:

- Precaution: A far-sighted, anticipatory and preventive planning shall promote sustainable use in marine areas and shall exclude risks and hazards of human activities on the marine ecosystem. Those activities that according to current scientific knowledge may lead to significant or irreversible impacts on the marine ecosystem and whose impacts may not be in total or in parts sufficiently predictable at present require a specific careful survey and weighting of the risks.
- Alternative development: Reasonable alternatives shall be developed to find solutions to avoid or reduce negative environmental and other impacts as well as impacts on the ecosystem goods and services.
- Mitigation: The measures are envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan.
- Relational Understanding: It is necessary to consider various effects on the ecosystem caused by human activities and interactions between human activities and the ecosystem, as well as among various human activities. This includes direct/indirect, cumulative, short/long-term permanent/temporary and positive/negative effects, as well as interrelations including sea- land interaction.
- Subsidiarity and Coherence: Maritime spatial planning with an ecosystem-based approach as an overarching principle shall be carried out at the most appropriate level and shall seek coherence between the different levels.

Table 25 MSP/ICZM Challenges And Opportunities

Challenges	Opportunities
Governance frameworks – Multilevel decision making/ coordination & cooperation between levels of decision making and planning	Enhance the role of regional authorities
Land-Sea interactions/ICZM - How to ensure coherence between MSP and territorial matters	Relevant authorities to enhance collaboration
Ecosystem and biodiversity conservation (EBA) - Environmental aspects, including how to ensure establishment of MPAs as integrated part of MSP processes	MPA management and connectivity
Transboundary context and cross-border cooperation	Enhance collaboration between north-south countries
Ways to ensure stakeholder engagement - Stakeholders should be included in all MSP steps	Raise MSP awareness
Innovative solutions to create and share data for MSP - data frameworks/data access/data harmonisation	Data exchanges
Monitoring and Evaluation of plans - Revision tools and methodology	Common methodologies towards a regional approach
Integration of project results	Capitalisation of regional projects
Qualified/skilled personnel	Enhance blue skills
Lack of local awareness	Raise awareness on the need for MSP strategies to support the blue economic sectors

- Regional frameworks are fairly spread across countries, which in principle should imply strong commitment in the implementation of MSP/ICSM practices (e.g. Barcelona Convention) but in practice still remain a strong encouragement rather than a mandate to implement such tools;
- Subregional processes and strong requirements for MSP/ICZM implementation are mainly referred to the north (EU Directive on MSP, etc.);
- Capacity building and R&I support are increasingly being provided, with stronger support for northern Mediterranean Countries but some country exceptions in the south (e.g. WestMED);
- Capitalisation is slowly emerging although currently mostly focussed in northern countries;
- Collaboration projects seem to be more heavily distributed but still with some notable gaps (e.g. south-eastern -Mediterranean countries remaining largely unsupported in this area).

Table 26 Projects related to MSP and ICZM

Project	Description	Funding Source	Period
MESP	**Managing the Environmental Sustainability of Ports for a durable development** addresses the reduction of water, air and noise pollution deriving from port activities through the implementation of a multidisciplinary approach, which encompasses technological, regulatory and administrative solutions. By reinforcing the cooperation between port authorities, scientific organisations and public administrations, it fosters the transfer of sustainable management models for port areas developed by MESP project in the Mediterranean.	ENPI CBC	2012 - 2015
CO-EVOLVE4BG	**Co-evolution of coastal human activities & Med natural systems for sustainable tourism & Blue Growth in the Mediterranean** looks at issues around the growth of tourism in the Mediterranean, by analysing and promoting the co-evolution of human activities and natural eco-systems in touristic coastal areas. In order to protect the environment and tackle climate change, Co-Evolve4BG is promoting the sustainable development of touristic activities using the principles of Integrated Coastal Zone Management (ICZM) and Maritime Spatial Planning (MSP).	Interreg MED	2019 - 2023
COMMON	**Coastal Management and Monitoring Network for tackling marine litter in Mediterranean sea** addresses the issue of marine litter though a global effort at basin level and a multi-institutional and multi-stakeholder approach - ones that tackles the different and competing environmental, economic, social, cultural and recreational drivers that can affect marine ecosystems. The COMMON project is applying the Integrated Coastal Zone Management (ICZM) principles to the challenge of marine litter, improving knowledge of the phenomenon, enhancing the environmental performance of pilot coastal areas and engaging local stakeholders in marine litter management.	Interreg MED	2019 - 2023
MED4EBM	**Mediterranean Forum for Applied Ecosystem-Based Management** tackles Ecosystem Based Management, by assisting ICZM actors in four coastal areas to jointly develop and apply a common methodology to make ecosystem-based ICZM much easier to design and implement – i.e. through innovative techniques and methods. A software tool helps institutional actors to better handle the complex multi-stakeholders analytical processes that characterize EBM applications and assess the relationships between ecosystem components, functions and services, as well as the associated human activities.	ENI CBC MED	2019 - 2023
PLASTIC-BUSTERS CAP	**PLASTIC-BUSTERS CAP** entails actions to enhance and transfer knowledge, experience and best practice tools that address the entire management cycle of marine litter – from monitoring and assessment to prevention and mitigation, towards an integrated and strategic approach (i.e. by coupling Ecosystem-based management and ICZM into local development planning). In the long-term, it will enhance ecosystem services via a reduced leakage of marine litter and marine plastic pollution in the Mediterranean Sea and less emissions of greenhouse gases by a wise-use and sustainable disposal of plastics.	ENI CBC MED	2021 - 2023

Project	Description	Funding Source	Period
THAL-CHOR II	**THAL-CHOR II** capitalises on the results of the previous Strategic Project THAL-CHOR: Cross-border Cooperation Maritime Spatial Planning Development, co-funded by the Interreg Greece-Cyprus 2007-2013 Programme. The capitalization is made at both the content and the corporate level, as it incorporates a new strategic partner, the Ministry of Environment and Energy of Greece, a competent authority for MSP in Greece. In terms of content in particular, the aim is no longer to prepare the two countries for the implementation of the Directive but to align with the requirements of the Directive and the gradual introduction of Maritime Spatial Planning by March 2021.	Interreg	2018 - 2023
MSPMED	**Toward the operational implementation of MSP in our common Mediterranean Sea** has the overarching objective to facilitate the MSP Directive's processes, currently at different stages of implementation in EU Member States (MS) surrounding the Mediterranean Sea, by supporting the establishment of coherent and coordinated maritime spatial plans across the Region. The MSP-MED project capitalises on the results of other EU-funded projects on MSP in the region, either recently carried out or still ongoing, and also promotes the active participation of both EU and non-EU Mediterranean countries, in a pan-Mediterranean approach. The MSP-MED project addresses specific issues regarding the national MSP implementation, tailored to the actual needs of each MS, and at the same time implements activities at basin scale, enhancing cooperation and knowledge sharing, finally ensuring coherence among the MS's plans.	EC	2020 - 2022
SIMWESTMED	**SIMWESTMED** focused on supporting the implementation of Maritime Spatial Planning in EU Member States and launching concrete and cross-border MSP initiatives between Member States.	DG MARE	2017 - 2018
UNITED	**Multi-Use Platforms and Co-Location Pilots Boosting Cost-Effective, and Eco-Friendly and Sustainable Production in Marine Environments** aims to prove that the co-existence of different activities in the same marine space is a feasible option (from an economic, social and environmental perspectives) for European maritime industry and local ecosystems. The project promotes the design of multi-purpose platforms and the development of different activities in the same area across the North Sea, the Baltic and the Mediterranean. The main activities focus around 5 pillars defined through the BG-05 call (i.e. Technology, Economy, Legal/Governance/Policy, Society, and Environment). The project demonstrates the benefits of co-location of different combinations of marine activities (i.e. renewable energy, aquaculture, bio-resources, environmental restoration, maritime transport, and tourism services) in the same marine space.	HORIZON 2020	2020 - 2023
REGINA-MSP	**REGINA (Regions to boost National Maritime Spatial Planning)** aims at improving the participation of Regions (level 2 units in the NUTS classification) as well as local authorities and stakeholders in the development and implementation of National maritime spatial planning.	CETMAR	2022 - 2024

Project	Description	Funding Source	Period
MSP Green	**MSP Green (Maritime Spatial Planning as enabler of the European Green Deal)** contributes to align maritime spatial plans to the ambition of the EGD by creating a framework for plans as marine enablers of the EGD. The framework will provide a cross-cutting approach to the EGD key topics relevant for marine environment and sustainable transition of blue economy: climate change, circular blue economy, marine biodiversity, marine renewable energies, sustainable food provision.	EMFAF	2022 - 2024
MSP Global Pilot Project: West Mediterranean	**MSP Global Pilot Project: West Mediterranean** aims to increase cooperation between EU and non-EU Member States, formulate regional recommendations in line with the WestMED Initiative and support the adoption of a roadmap and strengthen institutional capacities of participating countries.	EMFF	2018 - 2021

EMPLOYMENT

MSP and ICZM remain horizontal tools for sustainable Blue Economy. That means that skills from all Blue Economy sectors could be helpful during the MSP/ICZM process

Table 27 Skills needed for MSP/ ICZM development

Hard skills	Soft skills
• Language skills • Digital skills (ICT skills, especially for GIS, Data and AI) • Governance • Sustainability • Planning skills • All Blue Economy sector skills	• Self-direction • Problem-solving • Good communication competences • Willingness to learn • Resilience • Collaboration competencies • Team management • Leadership and responsibility • Productivity and accountability • Stakeholder engagement

Table 28 Examples of what jobs I can expect / Job range

On land / office work	Offshore and coastal work
• Planners (Terrestrial and maritime) • Public governance • Environmental Officer • ITC services i.e. GIS, Data modelling	• Scientists • Data management

SUMMARY OVERVIEW OF KEY FINDINGS

The 3rd edition of the UfM report on the Sustainable Blue Economy (SBE) in the Mediterranean offers a comprehensive review and analysis of current trends and future outlooks across different sectors, following the 10 priorities of the 2021 UfM Ministerial Declaration on SBE.

Despite the **significant (and growing) role of established sectors including tourism, ports, shipping, and fisheries** in the Mediterranean economy, the report emphasises current and potential challenges deriving from pollution, the reliance of fossil fuels, and supply chain disruptions, among others.

- The **maritime transport and ports** sector remains a cornerstone of the Mediterranean Blue Economy, handling over 80% of global trade and representing a hub for shipping routes between Europe, North Africa and Asia. However, the sector faces challenges related to **decarbonization, pollution, and supply chain disruptions** due to global crises. The report highlights that there is a clear trend towards **decarbonizing maritime transport** through the adoption of **zero-emission technologies and regulations** (i.e. the upcoming establishment of the Mediterranean as an Emission Control Area (ECA) by 2025), increased **digitalization**, and smart port initiatives. Nevertheless, high investment in new equipment and infrastructure will be needed.
- **Coastal and maritime tourism** is a cornerstone of most Mediterranean economies, contributing to 13% of Mediterranean exports. The region remains one of the world's top destinations, accounting for 35% of global tourist arrivals. Nonetheless, the report points out concerns about seasonality, climate change impacts and environmental degradation. A major shift toward sustainable tourism is needed, with a focus on **eco-tourism, based on local and circular models**, which can contribute to **reducing energy consumption**, and **mitigating environmental impacts**.
- **Fisheries** and **aquaculture** are well-established and form the backbone of the Mediterranean Blue Economy, providing employment and food security. Aquaculture has been growing steadily, especially in countries like Greece and Spain. Overfishing, habitat destruction, and pollution are major threats to the sustainability of fisheries. Aquaculture, while expanding, faces issues with environmental impacts and the need to improve its sustainability practices. For the future sustainability and resilience of these sectors, the report emphasizes technological innovations that reduce environmental harm, along with the adoption of new policies that promote **marine conservation** and **sustainable seafood production**.

In parallel, the **emerging sectors such as marine renewable energy and blue bioeconomy** analysed in the report hold immense potential to drive the future of the Mediterranean's Blue Economy. However, they require significant investment, regulatory support, and technological advancements to realize their full impact.

- Though in its early stages, **marine renewable energies**, and in particular **offshore wind**, have significant potential to **decarbonise the Mediterranean's energy infrastructure**, combating climate change and enhancing the sustainable development of the economies of coastal areas and, in particular, islands. However, high costs, technological challenges, and a lack of social acceptance are slowing development. The report highlights the need for **integrating MRE with Maritime Spatial Planning (MSP)** and **developing shared regulatory frameworks.**
- The **blue bioeconomy** (addressed in the Marine Research and Innovation Chapter), which includes marine biotechnology, bioproducts, and bio-resources, is emerging but also remains underdeveloped in the Mediterranean. Regulatory gaps, lack of investment, and insufficient research and development are holding back the full potential of this sector. While there are pilot projects and growing interest in biomass and marine-based pharmaceuticals, commercialization is limited. The report suggests growth will depend on **greater coordination between researchers, industry, and policymakers to build robust bioeconomy ecosystems** in the region.

Finally, the report highlights how **cross-cutting enablers and tools such as research and innovation, MSP, financing, governance, and maritime safety and security** play a crucial role in supporting both established and emerging sectors of the blue economy:

- **Research and Innovation** are foundational to driving the blue economy sustainable transition forward, particularly through the development of new technologies which lay the ground towards new economic sectors (e.g. MRE or blue biotechnology, as emphasised above). This transition also requires evolving "**Blue Skills**" to address labour shortages and boost innovation. Despite the potential, gaps persist in funding for R&I across Mediterranean countries, and limited integration of research outputs into policymaking is observed. The report underscores the importance of boosting knowledge transfer between EU and non-EU Mediterranean countries, as well as to address the skills mis-match, the so-called "brain drain", and gender disparities persisting in high-skilled and leadership roles.

- **Marine Spatial Planning (MSP)** is an essential tool for managing the competing uses of marine space while also protecting ecosystems. It aims to reduce conflicts between sectors and promote synergies. While MSP is gaining importance in the Mediterranean, its implementation is still uneven across countries, especially in the southern Mediterranean. The report emphasizes that the lack of **integrated data** and **cross-border cooperation** makes it difficult to establish effective MSP frameworks. There is also a need for stronger integration of **ecosystem-based management principles** into MSP.
- **Sustainable Financing** continues to be crucial for realizing the region's blue economy potential, with tools like blue bonds, impact investments, and public-private partnerships expected to drive investment into sectors like marine renewable energy and ecosystem restoration. The report highlights the **Blue Mediterranean Partnership** (BMP) as a significant milestone in pooling private sector resources and boosting cross-border collaboration towards large scale investment projects.
- **Governance** of the sustainable blue economy in the Mediterranean is complex due to the diversity of countries and the range of sectors involved. The Union for the Mediterranean (UfM) plays a key role in fostering regional cooperation by promoting a common vision for the SBE and aligning policies between countries. However, the **fragmentation of governance structures** across different countries and sectors is a major barrier, as well as gaps in policy coherence, especially between EU and non-EU Mediterranean states. The report points to the need for the development of more **inclusive decision-making processes**, involving **civil society, industry stakeholders, and local communities**, along with enhanced **regulatory harmonization** between countries.
- **Maritime Safety and Security (MSS)** remains a key pre-condition for the development of all the other sectors and activities. The Mediterranean region is facing new threats like cyber-attacks, hybrid warfare, and increased vulnerability of critical maritime infrastructures. The report highlights the need for **enhanced coastguard cooperation**, particularly through initiatives like the Mediterranean Coast Guard Functions Forum (MedCGFF), which is fostering capacity building and information sharing to tackle these threats more effectively.

Regardless of the number of challenges identified, the reports highlight a promising future for the sustainable blue economy in the mediterranean region, by **restating the relevance of the Ministerial Declaration priorities and related Roadmap** to boost innovation and effective policymaking across the region.

In this respect, the role of the UfM as an essential actor remains pivotal to steer effective policy commitments across the Mediterranean region and trigger greater synergies and convergence amongst the many initiatives in place.

Union for the Mediterranean
Union pour la Méditerranée
الاتحاد من أجل المتوسط

www.ufmsecretariat.org

ufmsecretariat

union-for-the-mediterranean

@ufmsecretariat

@UFMSecretariat

Supported by

german cooperation
DEUTSCHE ZUSAMMENARBEIT

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH