



**Co-Evolve4BG**

# Integrating Mediterranean Blue Growth and Coastal/ Maritime Tourism

- Mediterranean Scale -



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## OVERVIEW

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The present document was produced in the framework of **Co-Evolve4BG** project “Co-evolution of coastal human activities & Med natural systems for sustainable tourism & Blue Growth in the Mediterranean” in relation to Threats and Enabling Factors for maritime and coastal tourism development at a national scale” Co-funded by ENI CBC Med Program (Grant Agreement A\_B.4.4\_0075).

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# Abstract

This deliverable aims to integrate research, identify and record the concept of Mediterranean-wide blue growth, its established and emerging sectors, the benefits and possible impacts of blue growth on coastal tourism for the Mediterranean and the five countries under study. It is based on a review of existing data at national, Mediterranean and European levels. The deliverable is structured to present the relationship between blue economy, blue growth and corresponding sectors and identify the interaction between tourism and blue growth.

# **I. Sustainable Blue Economy concept**

## **I. Sustainable Blue Economy concept**

### **I.1. Introduction**

In recent years, the production and consumption models adopted, which lack in sustainability, have contributed to an excessive exploitation of the natural resources available on earth and to an irrefutable deterioration of the environment, which has pushed coastal countries to move towards the exploitation of maritime natural resources and to further develop economic activities linked to the sea. However, these maritime areas, rich in biodiversity and containing significant natural resources, are subject to enormous pressures of overexploitation and are threatened by the spread of pollution from different sources generated by a multitude of maritime and coastal activities.

To mitigate the impact of this situation, the international community has recognized the importance of adopting the blue sustainable economy as an engine of growth to ensure the sustainable development of coastal countries. This new concept, marketed following the international conference on sustainable development held in Rio de Janeiro in June 2012, highlighted the need for new approaches to ensure sustainable and inclusive management of marine environments and coastal areas, new methods of exploiting natural maritime resources and new measures for the protection of the marine environment.

### **I.2. From blue growth to sustainable blue economy**

Blue growth is a concept recently introduced in the governance of the use of maritime resources which was initially inspired by the concept of the blue economy. However, despite their use by diverse stakeholders, the terms “Blue Growth” and “Blue Economy” do not have a generally accepted definition. they reflect different meanings and approaches depending on the social contexts in which they are used.

The genesis of the concept of blue growth goes back to the conceptualization of sustainable development or the challenge of a sustainable use of natural resources while guaranteeing economic and social objectives, an idea supported by the United Nations since the 1970s and recently reaffirmed at the Rio+20 Conference. Also, the goal no. 14 of the United Nations 2030 Agenda for Sustainable Development aims to “conserve and sustainably use the oceans, seas and marine resources for sustainable development”. It is therefore evident that the problem of achieving environmental sustainability is characterized by three fundamental dimensions: environmental, economic and social.

Thus, the concept of blue growth revolves around the same three dimensions and

goes further by implying that in addition to conservation for future generations, the sustainable use of natural resources can promote economic growth and development.

### I.3. A new approach for a sustainable blue economy in the European Union

With 21 riparian countries stretching along its 46,000 km of coastline, the Mediterranean is an important space for Europe and the countries of the Middle East and North Africa because most of these countries depend on its resources. This marine space is not only a vector of growth and development, in particular a provider of food and job creation, it is also a climate regulator and a contributor to the well-being of coastal communities. Although marine ecosystems already provide many supply, support and regulation services, this marine space has been largely neglected and lacks coordination mechanisms between the various stakeholders for the sustainable use of the maritime space and its marine resources.

During the last years, the Mediterranean was one of the main concerns of the European Commission<sup>1</sup>:

- The year 2007 marked the distribution of the **Blue Book** proposing an integrated maritime policy (IMP) aimed at strengthening coordination between the various maritime policies and addressing issues related to the sea in a coherent manner.
- Since 2012, the European Union has adopted the concept of **Blue Growth**, which is based on the conviction that maritime spaces and coastal areas can help Europe to revive the economy and to deal with the tensions and problems it faces. According to the Commission, blue growth aims at “smart, sustainable and inclusive growth” focused on innovation and paves the way for a process of upgrading the blue economy, putting it back at the center of the concerns of Member States, regions, business and civil society”.
- In the year 2014, an action plan was presented by the European Commission on **“Innovation in the blue economy”**. the ultimate goal is to realize the job creation and growth potential of the seas and oceans. A series of initiatives aimed at increasing knowledge about the ocean, strengthening the coordination of marine research and improving the skills needed to apply new technologies in the marine environment.
- May 2021, the European Commission unveiled a communication aimed at making the transition envisaged by the European Green Deal a reality in the ocean economy to confirm that the **“Blue Economy”** plays a central role in

implementation of the **“European Green Deal”** and in carrying out other recent initiatives. The communication presents the proposals for a maritime policy for this decade and is addressed to all stakeholders in the maritime sector with a view to shaping a sustainable blue economy in a fair and equitable way. These proposals start from the postulate that a dualism between environmental protection and economy is inefficient and therefore propose a change of model, from **“Blue Growth”** to a **“Sustainable Blue Economy”**. To accomplish this transition, economic activities at sea and in coastal areas must reduce their cumulative impacts on the marine environment. Moreover, value chains must transform to contribute to climate neutrality, zero pollution, circular economy and waste prevention, marine biodiversity, coastal resilience and responsible food systems. Indeed, the main objective of the new approach for a sustainable economy in the UE is to promote smart, sustainable and inclusive growth and employment opportunities in the maritime economy.

## **II. Sustainable Blue Economy in the Mediterranean: the role of sustainable tourism**

## **II. Sustainable Blue Economy in the Mediterranean: the role of sustainable tourism**

### **II.1. Sustainable Blue Economy in the Mediterranean**

The concept of sustainable blue economy perceives the marine space as an environmental and socio-economic system in which there is a set of competing human objectives that must be addressed in a holistic approach. According to [The EU Blue Economy Report 2021](#), the blue economy consists of a series of branches and sub-sectors of the economy that are directly linked to the sea and oceans. More specifically, it includes the following sectors:

1. Sectors with a proven contribution to the economy, such as Marine living resources (capture fisheries and aquaculture), maritime transport, shipbuilding, coastal tourism, energy and all submarine mining sectors.
2. Areas with significant development potential, such as blue biotechnology, desalination, coastal and environmental protection, offshore wind and other marine renewable energies.

### **II.2. The role of sustainable tourism**

As one of the main established activities of the blue economy, coastal and maritime tourism constitutes one of the important development vectors of the global economy, especially for coastal countries with accessible and attractive coasts for visitors. Indeed, coastal tourism by definition includes seaside tourism, which is a form of coastal tourism comprising all beach tourism and leisure activities such as swimming, sunbathing on beaches, as well as all other activities for which the proximity to the sea is an advantage. For its part, maritime tourism includes nautical activities such as navigation, yachting and cruising.

Maritime/coastal tourism plays an important role in many Mediterranean countries' economies. It is vital for many countries of the European Union, it includes several related activities such as transport, hotel and catering. However, the covid-19 pandemic has put the tourism industry under unexpected pressure, especially with the government restrictions that were taken to limit its spread, which consisted of restricting air traffic, closing tourist businesses, preventing indoor gatherings and other preventative measures. According to *the European Commission*, this sector should regain its job-generating role for citizens and be an essential means of allowing visitors not only to access leisure activities, but also to know and discover the diversity of cultures and environments that offered by the European Union.



### **III. Established sectors: Status and main challenges at Countries scale**

### III. Established sectors: Status and main challenges at Countries scale

#### III.1. Marine living resources: fisheries and aquaculture

##### III.1.1. Description

Fisheries, the oldest exploited resource, and aquaculture are integral parts of the blue economy. Global fish production is increasing and reached nearly 171 million tons<sup>2</sup> in 2016, about half of which comes from aquaculture. It represents approximately 362 billion dollars, and provides more than 15% of the annual consumption of animal protein for 4.3 billion people.

In Europe, the production of fishery and aquaculture products covers approximately 3% of global production. The EU has around 59,000 active vessels landing around 4.5 million tons of seafood worth around €6.7 billion, while the aquaculture sector reaching a production of €1.2 million tons worth €4.1 billion in 2018. The employment of living marine resources in the EU's blue economy accounts for around 12% of total employment. and GVA around 11% of the total in 2018 with signs of improvement compared to 2009. In addition, capture fisheries production has increased and therefore profits have increased in recent years, in part due to better state of fish stocks and increased opportunities. ([The EU Blue Economy Report, 2021](#)).

The countries concerned by this study are **Spain, Italy, Greece, Lebanon** and **Tunisia**. The quantities of fish landed in the ports and the aquaculture production are illustrated in the following diagrams.

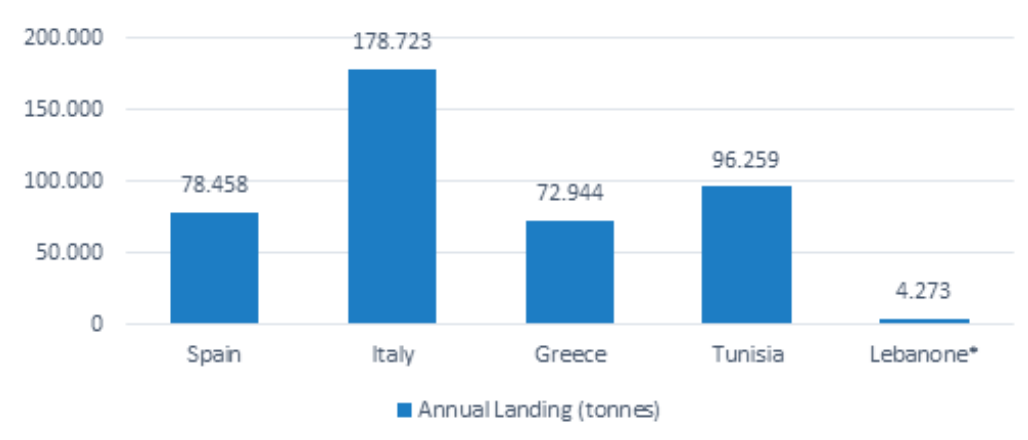


Figure 1. Annual Landing per country (Tons) (UfM, 2021)

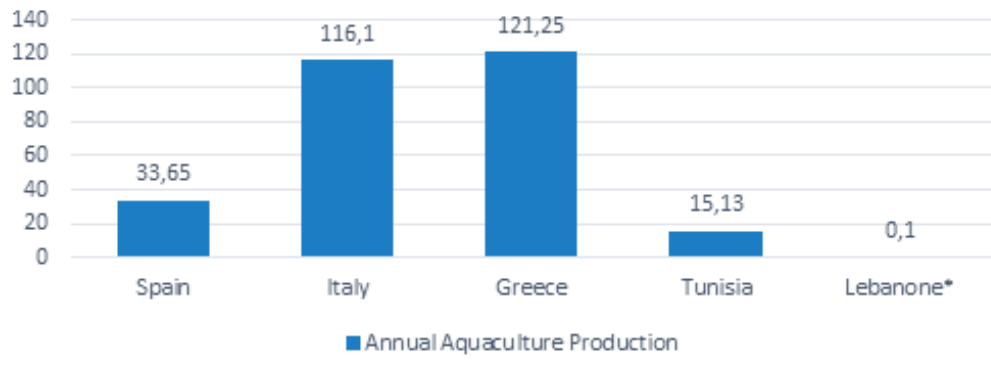


Figure 2. Annual Aquaculture Production per country (Tons) (UfM, 2021)

### III.1.2. The current situation and the main challenges at the countries scale

#### Lebanon

Lebanese fishing is considered to be small-scale, artisanal and traditionally based on bottom stationary gear (trammels and longlines), purse seines and beach seines. Small pelagic species are central to the fishing industry. National fish production is mainly consumed locally.

The number of fishing vessels reached 2,762 in 2011 (DFW 2013). The fishing fleet operates from 44 ports and landing sites (30 official ports) which are mostly small, overcrowded and in need of maintained breakwaters. At the local level, the fishing sector in Lebanon is represented by approximately 33 fishermen's cooperatives and 86% of the 9,000 fishermen hold a personal license.

Aquaculture in the coastal area of Lebanon was limited to a small experimental station in Batroun with an area of 1,000 m<sup>2</sup>. This station was not maintained in the 70s and 80s and eventually disappeared as a seed project for training fishermen in the best methods of farming marine fish.

#### Italy

The current state of living marine resources strongly suggests the need to implement initiatives to reverse the current trend of overexploitation and conserve biodiversity in marine ecosystems to ensure a sustainable future for the fisheries sector.

## **Greece**

Fish stock management remains critical in the Mediterranean Sea, with 87% of assessed stocks overexploited and a significant lack of knowledge on fishing pressure and reproductive capacity. In this regard, the MedFish4Ever initiative has launched a new political impetus to restore fisheries governance.

## **Spain**

Sustainable fishing generates economic benefits, guaranteed growth of fish stocks and recovery of marine ecosystems. Currently, there is a global process of acidification and climate change, with the repercussions of the loss of the number of fish. Furthermore, the problem of unregulated and unreported fishing is currently one of the greatest challenges to the health of marine ecosystems. (Moyer, Rife, & Moyer, 2015).

## **Tunisia**

The fishing sector appears as one of the most important sectors of the Tunisian economy, representing 7% of primary sector exports and providing around 50,620 direct jobs. The contribution of the agriculture and fisheries sector to the gross domestic product in Tunisia was about 11.77 billion Tunisian dinars (about 4.24 billion US dollars) in 2020. The value has slightly increased decreased from the previous year when it peaked at nearly 11.83 billion Tunisian dinars (4.26 billion US dollars). From 2010, the added value of this sector increased overall.

The Aquaculture sector makes a significant contribution to the food security and livelihoods of millions of people around the world. In Tunisia, the rates are considered low around 16% in terms of quantities of fisheries products and 1.76% in terms of direct jobs recorded in 20193.

## **III.2. Shipbuilding and repair**

### **III.2.1. Description**

Shipbuilding is considered one of the most strategic, oldest, most open and most competitive markets in the world. This business has become more global than local, due to the growing demand for globalization and the ease of movement of raw materials, components and finished products through the waterways of the world.

The shipbuilding market is valued at 121,420 million USD. In 2020, it was expected to reach USD 179,750 million by the end of 2026, growing at a compound annual growth rate (CAGR) of 5.7% over the period 2021-2026. As for the global ship repair and maintenance services market, it is expected to grow from USD 18.89 billion in 2018 to USD 39.93 billion by 2026 at a CAGR of 7.04% during the forecast period. forecast 2019-2026. The major factors driving the growth of the market for demand for new ships and business are shortening of supply chains in ship repair and maintenance services, increase in maritime trade amid the recent economic boom and increased ship production.

Although the shipbuilding industry has extensive experience in surviving during peaks and recessions in the economy, the current global economic, COVID-19 and political crises have hit the shipbuilding industry harder.

In the Mediterranean, particularly in Europe, there are around 300 highly specialized shipyards. High-tech, high-value shipbuilding segments such as cruise ships, offshore support vessels, ferries, mega yachts, etc. are highly promoted in the region. According to [The EU Blue economy report 2021](#), the European Union is a world leader in the production of advanced high-tech maritime equipment and systems. The sector in the EU accounts for around 7% of jobs and 8% of GVA across the EU blue economy as a whole in 2018.

### III.2.2. The current situation and the main challenges at the countries scale

#### Lebanon

The shipbuilding industry can be considered developed due to the fact that 19 shipbuilding and ship repair companies are available. Recently, a dry dock and a shipyard has started to be built in Al Arida village, Akkar, with a project of 75 million dollars, including a factory for the manufacture and maintenance of yachts and ships (including maintenance of oil tankers) and a fishing farm. The project will be built on a plot of 200,000 m<sup>2</sup>, part of which is by the sea, with a total built-up area of 70,000 m<sup>2</sup>. The factory will start manufacturing four yachts a year. It will create more than 50 jobs.

Lebanon is certainly famous for its legendary cedar wood used since antiquity both in shipbuilding and in the construction of houses and furniture. Cedar wood, finely worked with carvings, was well known and appreciated throughout the Mediterranean. Shipbuilding was certainly one of the most important artisanal activities in Lebanon. The overexploitation of majestic cedars has led craftsmen to use different species such as rosewood, olive, mahogany and beech.

## Italy

Italy occupies a leading position in Europe in the construction of passenger ships and luxury motor yachts. The shipbuilding industry systematically impacts employment, with more than 266,000 direct and indirect jobs, shipbuilding with 133,200 jobs, ship engineering 133,799 jobs (CCIAA, 2017).

## Tunisia

Faced with one of the busiest maritime routes in the world, Tunisia should derive annual revenues from ship repairs, bunkering, assistance and various logistical services of the order of two billion dollars.

The Menzel Bourguiba shipyard, nationalized in 1963, had largely contributed to the development of the Tunisian state for three decades. In the absence of a maritime strategy, this precious heritage was once again granted to a foreign investor without collecting any dividends outside employment at the local level.

The shipbuilding and ship repair industries offer wide direct and indirect employment opportunities in various fields to absorb around 20,000 unemployed young people through retraining and on-the-job training for the most part, with the possibility to also create other employment opportunities through the creation of small and medium-sized enterprises necessary to activate these sectors.

Development in the field of shipbuilding and maintenance in Tunisia in its three disciplines (trade, fishing and yachting) would be beneficial to the socio-economic needs of the country. Thus, it is necessary to encourage foreign investors from developed and industrialized countries in the fields of shipbuilding and nautical industries to settle in Tunisia, and to take advantage of its strategic geographical position in the Mediterranean basin near the main shipping lines around the world. Thus, it will offer better services and a much lower cost of labor for the construction and naval maintenance of merchant ships, warships, trawlers and pleasure boats of foreign countries.

### III.2.3. Interaction with other sectors and the environment

According to The EU Blue Economy Report 2021, the potential impact of emissions from shipbuilding operations on their immediate surroundings can be very significant, especially as shipyards are inevitably near and on the water, which increases the probability of the spread of some of these emissions, in particular due to hazardous materials (such as asbestos, lead etc., which negatively affect the coastal zone and fishing areas. In this context, conflicts of Interests may arise with certain activities that

occupy part of the marine space, such as tourism and fishing, as well as fixed fisheries established along the coast or at sea, and whose productivity and sustainability are closely linked to a healthy and clean marine environment.

### III.3. Coastal and maritime tourism

#### III.3.1. Description

As one of the main established activities of the sustainable blue economy, coastal and maritime tourism represents a considerable part of the maritime activities and an important element of the blue economy which provides between 6 and 7% of the jobs in the world with an annual rate growth estimated at more than 3.5%. Coastal tourism is largely based on the environment attracting millions of visitors in search of seascapes and direct contact with nature, and should represent 26% of the blue economy by 2030, the leading sector in terms of global added value.

Moreover, coastal and maritime tourism is one of the important development vectors of the world economy, especially for island countries with accessible and attractive coasts for visitors. According to the World Travel and Tourism Council 6, around 1.5 billion international tourist arrivals were recorded worldwide in 2019, an increase of 4% compared to 2018. Moreover, the coastal tourism sector shows its role as growth engine of the world economy with a contribution of 3.6% to world GDP for a value of approximately 2849.2 million (USD) against 3.2% recorded in 2018, thus generating 125.6 million direct jobs equivalent to 3.9% of global jobs.

The Mediterranean region counts about the 40% of the global arrivals. Coastal areas and islands tend to be the major reason about this. Their unique characteristics making them ideal places for leisure and tourism activities. However, the growing number of tourists has raised concerns about the sustainable tourism of coastal and maritime areas.

#### III.3.2. The current situation and the main challenges at the countries scale

##### Lebanon

Coastal tourism is an important element of the economic and social fabric of the country, but this is not the case for maritime tourism. If the country is divided according to its types of tourism related to geography, coastal tourism will be ranked first, followed by mountain tourism and finally maritime tourism.

This diversity in this classification is attributed to the fact that the whole of Lebanon can be considered as a coastal area, especially that the coast, the mountains and

the interior region are very close to each other, which facilitates transport between them. In addition, the mountainous region of Lebanon is characterized by a unique landscape (water resources, snow cover, vegetation, etc.), which is remarkable in the entire Middle East region. This diverts attention to the maritime region where tourism is experiencing several constraints, namely the geopolitical conflict which places the maritime space under frequent threats, the lack of financial resources to adopt a major tourism project in the maritime region and the existence of frequent sources of pollution such as the dumping of liquid and solid waste, oil spills, etc.

## **Italy**

Coastal tourism plays an important role in the Italian economy. According to [the BLUEMED, 2019](#), its contribution to the national GDP is around 10% and the number of jobs stands at 13%). Although sea bathing and seaside tourism only generates 21% of arrivals, it accounts for 30% of attendance, making it the main type of tourism in Italy. This is also reflected in the seasonality of tourism, characterized by a strong summer peak.

Some areas are characterized by a high number of tourists while other places, particularly in the coastal hinterland, struggle to become popular tourist destinations.

However, coastal destinations experience considerable seasonal problems and are highly dependent on “traditional” and typical beaches and bathing establishments, mainly related to relaxation and recreation, which show lower consumer spending compared to other types of tourism.

A fundamental step is to properly assess the impact of tourism on the marine environment, its spatio-temporal variability and the ecosystem services affected through dedicated monitoring plans. It is necessary to differentiate tourist offers and distribute tourist flows sustainably, developing products that attract not only summer trips but also customers to discover coastal destinations throughout the year.

## **Tunisia**

Tunisia has established itself as one of the main tourist destinations on the southern shore of the Mediterranean basin. Coastal tourism is one of the fundamental sectors of the economy and a major contributor to the country's development, playing a key role in terms of foreign exchange earnings and job creation. Tourism activity contributed significantly for about 14% of the national GDP, or 16 billion dinars recorded at the end of 2019, which helped to cover about 21% of the trade balance deficit and includes some 400 thousand direct and indirect jobs presenting more than 12% of the active population.



The tourism model adopted from then on in Tunisia is that of industrial tourism of the Fordist type 7 which consequently allowed the emergence of mass tourism. The development of the tourism sector has been the result of several factors, namely the appearance of paid holidays in developed countries accompanied by the increase in wage income and combined with technical innovations in the field of transport which is characterized by the decline its price, especially for air transport.

To compensate for its economic backwardness, several measures have been taken to remedy the situation by setting up a system of incentives and assistance with the aim of attracting national and foreign investors, hence a massive policy of construction of the hotels along the coast were initiated to accommodate as many tourists as possible, which over time has become like a heavy industry.

Thus, 95% of Tunisian tourism is that of seaside tourism which remains the main reason for the stay. With a capacity of more than 200,000 beds, the hotel presents the most preferred mode of accommodation for target visitors.

### III.3.3. Interactions with other sectors and the environment

The coast and the marine environment are exposed to several sources of pollution generated not only by tourist activity, but also by urban concentration due to the increase in population in coastal areas. The impact of the environment on the tourism sector is also important because the quality of the environment offered to border arrivals constitutes an essential component in the pricing of the target destination. On the contrary, it translates into a loss of revenue for the hospitality industry.

Pollution generated by tourist activity or by any other action likely to develop along the coast, such as offshore oil and gas industries or the extraction of mines in the marine environment, can in turn contribute to the degradation of the biodiversity, which therefore affects coastal areas and maritime tourist activity.

## **IV. Emerging Sectors**

## IV. Emerging Sectors

### IV.1. Marine Renewable Energy

#### IV.1.1. Description

The seas offer renewable marine energy sources, in particular offshore wind turbines which use the energy of the winds, the tidal turbine which uses the energy of the currents, the wave energy which uses the energy of the waves and the thermal energy which exploits the temperature difference between surface waters and deep waters, designating a set of technologies that exploit the different forms of energy contained in the oceans such as waves, tidal movements, thermal fluxes and sea winds.

These sources can significantly contribute to generating low-carbon electricity. According to The European Commission more than 2000 wind turbines were installed in more than 70 parks. Offshore wind turbines are the most widespread technology in the world, Europe is the leader with 90% of the world's energy produced, which has 12 GW of existing offshore wind turbines and is estimated at 60 GW of offshore wind power and 1 GW of ocean power by 2030.

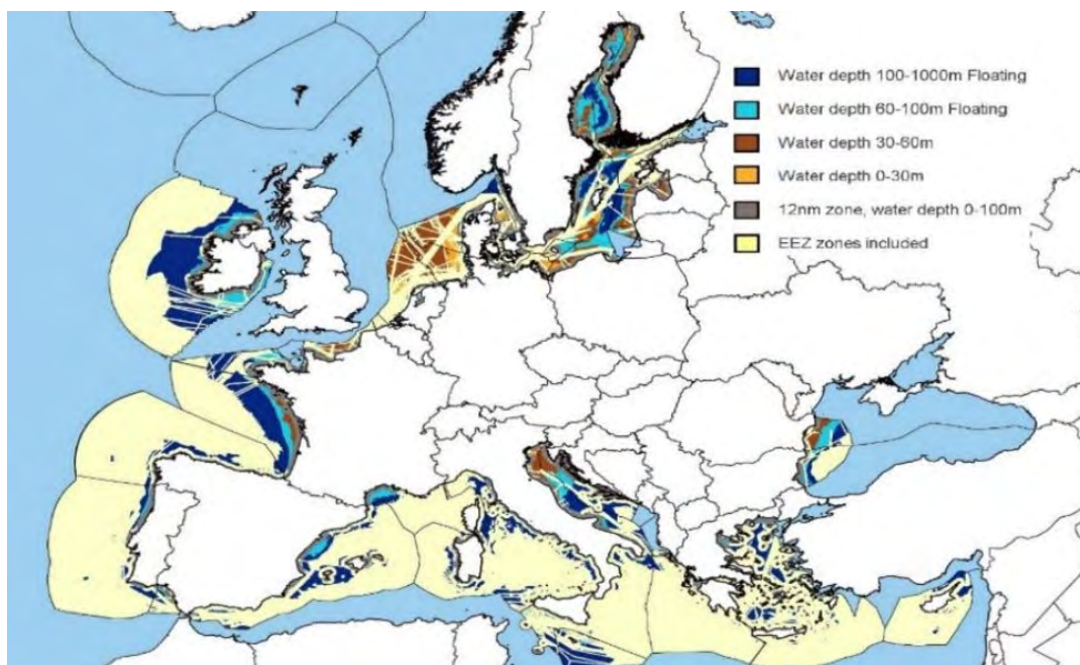


Figure 3. Offshore Wind Potentials (The EU Blue Economy Report, 2021)

## IV.1.2. The current situation and the main challenges at the countries scale

### Lebanon

The “National Wind Atlas of Lebanon” was published by the UNDP-CEDRO project in 2011 and has been modeled at mesoscale and microscale for the entire country to produce a wind map at heights of 50 m and 80 m above the ground and at a resolution of 100 m (Hassan, 2011). However, the Atlas did not take into account offshore positioning for wind resources.

Besides, solar energy is also a valuable resource in Lebanon. With approximately 3,000 hours of sunshine per year, adding this energy source to the national grid could greatly contribute to the growth of clean energy in Lebanon. Solar energy currently represents around 0.26% of the country's energy mix.

The implementation of solar power off Lebanon has never been discussed. While if these two aspects of green energy were exploited in the maritime region of Lebanon, they would allow, in addition to the optimal production of energy, to produce clean energy and avoid polluting the environment.

### Italy

The issue of environmental sustainability of hydrocarbon activities has led to a significant decrease in permits granted and exploration resulting in an acceleration of the end of life of offshore activities in recent years. In Italy, the geophysical knowledge of a significant number of hydrocarbon reserves in the Adriatic-Ionian Seas is relatively well established and relevant data are available. Italian technology and know-how in geophysical exploration (drilling, maintenance of equipment in difficult environments, logistics (air and sea) and dismantling) are increasingly compatible with blue growth strategies.

In addition, the Italian coasts offer substantial opportunities for both significant energy production and technological development. The latter is mainly favored by the specificities of the Mediterranean basin, where milder climatic conditions make it possible to test devices at lower cost and stimulate the design of particularly efficient technologies for recovering energy from the oceans.

The most promising Italian ocean energy technologies focus on wave and tidal energy converters. A range of innovative technical solutions have been developed with the aim of improving the efficiency of energy conversion and/or storage and distribution. Italian SMEs engaged in the supply chain of wave and tidal energy converters have a long and rich history of innovation capacity, able to support all specific and high-

tech stages of the design and production process. The country is indeed at the forefront of research in the development and testing of prototypes and pre-market devices for ocean energy conversion. This is confirmed by the number of international partnerships in which Italian actors are actively involved.

As a result, Italy's ocean energy sector may be at an earlier stage of development, but growing interest in harnessing wave and tidal technology to generate clean, renewable energy is evident from the government's intervention. Italy's competitive opportunities on the international stage would improve significantly with the creation and continued support of blue energy companies and high-tech clusters, and with stronger ties to historical industries based on the awareness. -make that provide specific manufacturing expertise.

## Tunisia

The contribution of renewable energy to the country's energy balance remains modest, not exceeding 1%. Although offshore wind turbines are not yet included in the state energy policy, it is important to note that like other countries on the southern shore of the Mediterranean, Tunisia has real potential wind technology.

A map showing the wind atlas of Tunisia updated in 2015 by The National Agency for Energy Management shows an energy potential in sites favorable to the establishment of onshore wind farms manifested at 10 GW. The technical potential of offshore wind is presented at 258 GW according to a map published by [The World Bank in March 2020](#). These assets that Tunisia possesses present important alternatives that can be used in the short and long term in the energy policy of the state as developed in the countries on the northern shore of the Mediterranean.

## IV.2. Marine Non-living Resources: Deep Seabed Mining

### IV.2.1. Description

The seabed is a new source of mineral resources. There are many types of minerals that can be found in seawater or on the seabed. These minerals are sometimes formed in place and others are transported by erosion from the continents to coastal areas, where they are extracted from shallow continental shelves and beaches. According to The European Commission, 10% of annual mining production will come from seabed mining by 2030. Similarly, the Commission's proposal on baseline conditions for such projects foresees that the global annual revenues of marine mineral mining is expected to grow from virtually nothing today to 1,048 billion euros by 2030.

Currently, no commercial seabed mining projects exist in the region or in areas under

national jurisdiction of EU Member States. Nevertheless, The International Seabed Authority ISA has 30 active contracts for seabed exploration in areas beyond national jurisdiction. Exploration licenses have been awarded to eight exploration areas, spread across the Atlantic, Pacific and Indian Oceans. According to [The EU Blue Economy Report 2021](#), scientists argue that biodiversity loss from deep-sea mining is likely to be unavoidable and irrevocable, and therefore most likely permanent.

In January 2018, the European Parliament passed a resolution on international ocean governance, calling for a moratorium on commercial deep-sea mining licenses until the environmental risks are fully understood. At the same time, the EU will continue to fund research on the impact of deep-sea mining activities and on environmentally friendly technologies.

#### **IV.2.2. Main challenges at the countries scale**

The activity of extracting resources from the seabed is an activity resulting from new technologies and increasing market demand for minerals. The exploitation of the maritime mineral resources of the countries registered in the Co-evolve4BG project and which are part of the European Union, in particular Italy, Spain and Greece, is an activity not yet developed and which is the subject of projects and studies under development. While taking into account the impact on the maritime environment, the EU will plan an adequate design of its mining strategy in the medium and short term and will continue to finance studies on the seabed to have a good knowledge of the existing resources of the seabed. This financing also aims to develop research on the impact of said activities on the marine environment and to improve the technologies to be adopted to guarantee the protection and maintenance of biodiversity.

##### **Lebanon**

Offshore mining of marine minerals in Lebanon does not exist and has never been considered in development plans. This is due to the lack of scientific studies, as well as the unavailability of financial resources. However, salt mining is the only aspect of marine mining in Lebanon and has been known since ancient times. Nowadays, Lebanon produces about 45,000 tons per year for local uses. Most of the Salinas in Lebanon are located on the northern coast between Tripoli and Byblos.

##### **Tunisia**

The lack of funds, technologies and research and the scarcity of data concerning the seabed are the main challenges the Tunisian government faces in developing this sector. So far, this sector is still undeveloped and needs to be regulated.

As land-based mining industries face increasing complexities, for example,

diminishing return on investment, environmental degradation and geopolitical tensions, governments are looking for alternatives. After decades of anticipation, technological innovation and exploration, seabed mining in the oceans has, according to the mining industry, come one step closer to implementation. The DSM industry is currently awaiting international regulations that will guide future operation.

### IV.2.3. Interaction with other sectors and the environment

As stated earlier, marine scientists argue that seabed mining could lead to pollution, degradation of the seabed and threaten fragile marine life. Additionally, mining could also significantly increase the turbidity of the waters where it occurs, as each ton of manganese nodule extracted from the seabed could result in sediment being deposited in deep waters. Similarly, sediment transported to the surface with the minerals could decrease the levels of sunlight there, and therefore photosynthesis, with long-term effects on biological productivity.

All of these factors explain why the EU is pushing for the adoption of “ocean governance” principles to manage fishing activities, preserve ecosystems and regulate mining production before large-scale exploitation begins.

## IV.3. Blue bio-economy and biotechnology

### IV.3.1. Description

Emerging blue bioeconomy and biotechnology sectors focus on groups of marine organisms that are still underestimated for commercial exploitation. Marine organisms include microalgae, bacteria and fungi, algae and invertebrates such as starfish, sea cucumbers and sea urchins. Algae can potentially be used to develop new pharmaceuticals, bring healthy foods to market, or replace fish oil in animal feed and reduce methane emissions if added to livestock feed. In addition to providing healthy food, it can contribute to carbon sequestration, nutrient and CO<sub>2</sub> removal from the marine ecosystem. Algae can also be used in cosmetics (anti-aging moisturizers, toothpastes), crop nutrition as bio-fertilizers, biodegradable packaging and biofuels.

According to the OECD, the potential of the blue bioeconomy is hidden in the transformation of aquatic biomass into food, animal feed, nutraceuticals, pharmaceuticals, cosmetics, energy, packaging, clothing and much more. Blue biotechnology is the application of science and technology to living aquatic organisms for the production of knowledge, goods and services.

In Europe and according to the EU Blue Economy Report 2021, the blue bioeconomy and biotechnology sectors include groups of marine organisms and their biomass



applications. This biomass is used for a variety of commercial applications, including food and dietary supplements, cosmetics, fertilizers, biomaterials, bioremediation or biofuels. Currently, Europe is witnessing a rapid, albeit uneven, development of the blue bioeconomy, supported by strong research and stakeholder engagement.

### IV.3.2. Main challenges at the countries scale

#### Lebanon

In Lebanon, an EU-funded project (*COMMON*) focusing on **Italy, Tunisia** and **Lebanon**, targeted cross-border cooperation as a basis for tackling marine litter, which threatens marine biotech potential. The construction of a network of coastal cities against marine litter and a permanent network of sea turtle rescue centers for marine litter studies are planned in this project. The Mediterranean region, including Lebanon, accounts for some of the largest amounts of municipal solid waste generated annually per person, and has insufficient waste treatment infrastructure. The main sources of marine litter are poorly managed urban waste. Plastic waste from the Mediterranean coastal areas is usually in the form of packaging, bags, packaging and objects related to fishing.

#### Tunisia

The Tunisian experience shows many signs of growth and interest in blue biotechnology. Indeed, Investment in Research and Development (R&D) represents approximately 1.5% of GDP in 2019. Blue biotechnology in Tunisia has an impact on aquaculture and contributes to its development (breeding, disease control, optimization ...).

However, biotechnology research centers are considered new and factual information on biotechnology is too fragmented and scarce to make a solid assessment of the performance of the sector.

### IV.3.3. Interaction with other sectors and the environment

An important link exists between marine biotechnologies applied to well-being and thermal/health tourism could have a double positive impact on the economy of Mediterranean countries, stimulating research which can, in turn, generate incentives to specialize in a particular niche of the tourism sector, and therefore, have a comparative advantage over the Mediterranean competition.

Aquaculture is also a sector that would greatly benefit from the application of marine biotechnologies aimed at improving husbandry, minimizing and controlling disease and optimizing the culture process. According to the *FAO in 2010*, it appears that the aquaculture sector is very promising, with an active international trade. Therefore,



the optimization of fish culture methods in maritime areas could benefit the sector, improving the marketing and competitiveness of products.

## IV.4. Desalination

### IV.4.1. Description

Water desalination by definition is the process of separating salts from a brackish solution (brackish water or seawater) into water suitable for human consumption, industrial or agricultural use.

Indeed, desalination has recently been adopted as one of the main technical measures for water management, as well as in the processes of adaptation and mitigation to water scarcity and changing climatic conditions.

### IV.4.2. Main challenges at the countries scale

There are mega desalination plants clustering around the Mediterranean Sea. In fact, in most southern Mediterranean countries, there is growing concern that available freshwater resources are currently facing or will soon face severe chronic shortages that could make life difficult, and among the solutions envisaged by the countries include the production of fresh water by desalination of sea water. Thus, desalination plants have been built for several decades on different scales in almost all the Mediterranean countries.

In Europe, desalination capacity increased between 2000 and 2009. According to *The EU Blue economy report*, in January 2021 the European Union had more than 2,309 operational plants producing 9.2 million m<sup>3</sup>/day of fresh water. The desalination capacity of coastal areas is mainly located in the Mediterranean, providing more than 5 million m<sup>3</sup>/day of fresh water. The countries covered by the **Co-evolve4BG** project have uneven rates, such as **Spain** which holds approximately **65%** of desalination capacity in the EU, the rest of the capacity being mainly in **Italy** with **7.5%** and in **Greece** with **2.8%** ([The EU Blue Economy Report, 2021](#)).

#### Lebanon

For Lebanon, no desalination plant exists, even on a small scale. However, it is paradoxical and premature to propose desalination as an alternative approach to water management, in particular that the water resources are enormous to meet the demand of the inhabitants. This concept is in contradiction with the fact that water is available in Lebanon and estimated at 1350 m<sup>3</sup>/inhabitant/year ([Shaban, 2020](#)).

## **Tunisia**

Water resources in Tunisia are inventoried and well identified. The Tunisian potential is about 4840 Mm<sup>3</sup> (Surface water: 2700 Mm<sup>3</sup> - Groundwater: 2140 Mm<sup>3</sup>) and the available resources are about 4640 Mm<sup>3</sup> in 2014, per inhabitant/year and the water availability is about 440 m<sup>3</sup>. In 2014, approximately 93% of resources were mobilized.

Tunisia has limited water resources mainly in the Center and the South. Unconventional water resources (desalination, water reuse) and renewable energies are of the utmost importance for water supply whether for the domestic, industrial or agricultural sectors (high value crops). Indeed, Tunisia has launched an ambitious desalination program which is still ongoing. Proper design of desalination units could be a solution for small communities and agriculture to thrive.

### **IV.4.3. Main challenges at the countries scale**

The impacts of this sector on other sectors, in particular coastal tourism, and on the environment and the landscape from a visual point of view must be carefully considered. It contributes to air pollution and global warming (CO<sub>2</sub> emissions). Renewable energy could be used in desalination plants with a capacity of 50 to 100 m<sup>3</sup> per day and these plants could serve small villages.

Most desalination plants are for brackish water. Releases are discharged into the sea. The impacts of discharges at sea must be taken into account because of their impact on biodiversity and the marine and coastal environment.

**V.  
Initiatives  
to promote  
Sustainable Blue  
Economy at the  
Mediterranean  
scale**

## **V. Initiatives to promote Sustainable Blue Economy at the Mediterranean scale**

At the Mediterranean scale, the initiatives to promote sustainable blue growth are multiple. indeed, the European Union recognizes the sense of cooperation at the level of the Mediterranean where there are more than 20 countries, most of them in the European Union. While cooperation is necessary for the management of coastal activities, the protection of the environment and maritime heritage, the prevention of wars and pollution, the improvement of maritime security and the promotion of blue growth, the European Union has taken certain initiatives to improve this cooperation.

The initiative for the sustainable development of the blue economy has been developed. Five (5) European countries (France, Italy, Portugal, Spain and Malta) and five (5) North African countries (Algeria, Libya, Mauritania, Morocco and Tunisia) contribute to creating a safer maritime area and promoting safe navigation, smart and a resilient blue economy.

Moreover, the Blue Growth Interreg MED horizontal project (2019-2022) is the continuation of the InnoBlue Growth Interreg MED horizontal project (2016-2019) and is a main initiative to promote blue growth at the Mediterranean level ([Blue Growth, 2019](#)).

Some Interreg MED Blue Growth projects could be good practices to promote Blue Growth. The transfer of results and/or tools could contribute to the development of blue growth at the Mediterranean level.

## **VI. Legal Measures taken to Promote Blue Growth**

## VI. Legal Measures taken to Promote Blue Growth

European Union has developed a strategy for sustainable Blue Growth, recognizing that oceans and seas are important levers for European economy that additionally have important power for innovation and growth. Also, connects this strategy with Strategy “Europe 2020” for smart, sustainable and inclusive development. EU’s policy for Blue Growth contains also MSFD, Blue Growth Strategy and ICZM.

Recognizing the meaning and the difficulties that sets the development of such a policy, the European Union funds political priorities for the integrated maritime policy in accordance with Directive 508/2014 and through annual Work Packages and Programs of the European Maritime and Fisheries Fund.

### Lebanon

Lebanon is a party to the United Nations Convention on the Law of the Sea of 1982 and to the United Nations Compliance Agreement since 1995. In addition, Lebanon is an active member of the General Fisheries Commission for the Mediterranean GFCM (DFW, 2013). The Lebanese government has announced several MPAs for their role in nature conservation but also for their crucial role in educating local communities and visitors about the culture, history and heritage of Lebanon located east of the Mediterranean. The designation of coastal or marine protected areas is associated with historical and current land use, historical and current human culture and values associated with specific localities in the Mediterranean marine environment.

Since 1929, several laws and regulations have been adopted by the Lebanese parliament dealing with the control of sources of coastal contamination, the protection of heritage and archaeological sites, the regulation of the maritime public domain, the organization of fishing activities and, more recently, the land use planning Project (SDATL, 2004). The MoE is responsible for the most important piece of legislation, the Environmental Code, which deals with the protection and conservation of terrestrial and marine ecosystems. The Ministry of Education also implements, through Decree No. 4869 of September 2, 2010, the grant on “Sustainable Management of Biodiversity and Marine and Coastal Habitats through Policy and Legislative Development for the integration in Lebanon”.

Unfortunately, the “implementing decrees” are still awaiting the approval of the national cabinet. Moreover, some of these regulations are enacted, but poorly applied on the ground.

## Greece

Like other Mediterranean countries, Greece does not have any policies applied in terms of ICZM, MSP, MSFD or blue growth strategy. Many presidential decrees, ministerial decisions and other laws also refer to other issues or sectors that indirectly influence coastal zones. These references relate to the management of protected areas, the organization of port facilities, industry, tourism, etc. Solely on the Maritime Spatial Planning component, a legislative tool frames the coastline, in article 3 of Law n° 4447/2016, which stipulates that the National Spatial Strategy must include key axes of sustainable development for sub-categories of the national territory.

## Spain

Spain and therefore the Ministry of Agriculture, Fisheries and Food (*MAPA-Blue Growth*) are firmly committed to blue growth. For this reason, and as an immediate action, the General Secretariat for Fisheries offers the sector, through the Pescazul team, a fundraising service for projects related to fisheries and aquaculture, as well as to the processing and marketing of the products of both. This service also includes support for the preparation of proposals to be submitted to calls for proposals when these are of national interest.

Among the various initiatives in favor of blue growth, an example is the granting of subsidies for the hiring of full-time unemployed workers for a minimum period of six months by individuals or entities that are directly or indirectly linked to growth. green and/or or blue economy or which, not being related, generate jobs that contribute to a sustainable business sector or to the management of environmental improvement in the entity, with the aim of contributing to meet the major current challenges such as the crisis generated by the loss of biodiversity, climate change and the demographic challenge, promoting an ecological and just transition and building a more resilient and sustainable future.

## Tunisia

The blue economy covers a wide range of sectors with significant potential synergies in terms of sea-related activities and integrated coastal management. The sea is an interdepartmental object by nature supporting a large number of complementary and competing activities which are part of an extremely varied discipline. It has become essential to translate these issues related to the governance of the sea into a governmental organization bringing together all the skills of the various ministries.

Indeed, we can identify more than 40 types of activities and procedures closely related to the sea and whose management includes many structures and institutions to carry out different actions. In the following table, we will present the different actors involved in the governance of maritime space and coastal areas in Tunisia alongside the maritime cluster.

Faced with its international commitments, the Tunisian State has developed an exhaustive legislative and regulatory arsenal for the various aspects related to the sea, such as the management of maritime activities and the public domain, the fight against pollution of marine environments and the protection of biological diversity. These texts are largely influenced by international developments and the guidelines of ratified international conventions.

Nevertheless, and after a first reading of the legal framework governing the various aspects of the blue economy, it was found that one of the future challenges is to harmonize these texts with the provisions of international conventions. The ICZM Integrated Coastal Zone Management Protocol, which presents a coastal zone governance instrument, has been signed but not yet ratified. The texts governing maritime activities need updating to comply with the development witnessed by most maritime activities such as the aquaculture industry which is among the emerging activities of the blue economy.

Moreover, and at the level of the institutional framework, a multitude of actors involved in areas related to the sea and the coast have been observed. Before the creation of the General Secretariat for Maritime Affairs SGAM, one of the difficulties in the management of marine and coastal environments was that of the absence of a steering entity to coordinate the efforts deployed and ensure complementarity between the various sectoral plans.



**VII.**  
**Advantages and  
possible impacts  
of Sustainable  
Blue Economy on  
Coastal/Maritime  
Tourism**

## **VII. Advantages and possible impacts of Sustainable Blue Economy on Coastal/Maritime Tourism**

Coastal tourism concerns the beach and related activities, such as swimming, sunbathing, coastal walks, etc. Marine tourism concerns water and related activities, such as sailing, scuba diving, cruising, etc.

According to *The EU Blue economy report ,2021*, The largest sector, in terms of gross value added and employment, of the blue economy is coastal tourism. In 2018, coastal tourism accounted for 64% of employment and 45% of GVA in the EU blue economy. According to the EU blue growth strategy, coastal and maritime tourism has a high probability of promoting a smart, sustainable and inclusive Europe.

The demand for coastal tourism is constantly increasing, reaching massive concentrations of tourists in certain areas of the Mediterranean during the summer season. This tourism poses a series of threats and dangers to the natural, physical and even cultural environment. This trend has changed in recent years as many tourists opt for eco-holidays that respect the environment and local cultures ([UNEP, 2013](#)).

The blue economy is an effective tool for preserving the culture and heritage of Mediterranean countries, historic sites, natural habitats and the physical environment. Similarly, local economic tourism strategies ensure environmental sustainability, social benefits and economic development of the local community. Carefully thought-out tourism plans that are well integrated into countries' development master plans make a difference to the tourism industry. It is true that planning for sustainable tourism development is a complex activity, but with the initiatives to implement the sustainable blue economy, things can become much easier.

**VIII.**

**The measures to  
be taken to achieve  
a sustainable and  
inclusive blue  
economy at the  
Mediterranean  
level**

## **VIII. The measures to be taken to achieve a sustainable and inclusive blue economy at the Mediterranean level**

The future challenges in terms of sea-related activities seem important and therefore require immediate interventions at different levels. Indeed, the economic model currently adopted has marked its limits and stimulates the obligation to change the management methods of the coastal zone and the marine environment for the benefit of environmental sustainability.

However, for a successful transition to a sustainable blue economy, it has become crucial to make integrated coastal and marine spatial management an ultimate goal in order to achieve blue growth that takes into account all maritime activities and the sectoral interactions that they characterize.

Thus, independently of the economic results obtained for each of the countries registered in the **Co-evolve4BG** Project and analysed previously, this part is devoted to highlighting the main measures to be taken into account, and to presenting a set of recommendations in order to achieve a transition to a sustainable and inclusive blue economy.

### **1 - Put in place clear measures on integrated coastal zone management (ICZM)**

The first factor to take into account is that of the application of the ICZM Protocol at the level of the Mediterranean countries. Indeed, the integrated management of coastal zones is considered as one of the decisive tools of governance which opposes the sectorial management of the coastal space, and which takes into account at the same time the participation of a wide range of partners and all the effects of coastal development on the land and marine environment.

The integrated management of the coastal space also aims to ensure better coordination of the action of the public authorities in order to achieve better use of the maritime and coastal spaces in which economic development is likely to develop. This governance tool makes it possible to identify all the interactions between the existing natural resources, the socio-economic constraints and the possible conflicts of interest of the different economic sectors.

### **2 - The need to establish a spatial planning of the maritime space in accordance with the activities practiced offshore: An integrated maritime policy (IMP).**

Marine environment planning is one of the major instruments of the integrated maritime policy that can mitigate these phenomena by highlighting a redeployment of economic activities. With regard to the blue economy, marine spatial planning is

an instrument to facilitate decision-making and to provide a framework for arbitrating conflicts of interest on the one hand, and for managing the impact on the marine environment by human activities on the other hand. It thus allows coordination between the parties involved, and the best possible use of marine areas in order to achieve sustainable and inclusive economic development.

### **3 - The governance of the blue economy (legislative framework/ institutional level)**

It has become crucial to put in place a comprehensive legal framework that allows the governance of activities occupying the maritime and coastal space in order to achieve the previously defined objectives and meet the needs of coastal communities while ensuring the protection of the environment.

One of the major issues in the governance of the maritime and coastal space as well as activities related to the blue economy is that of the existence of a multitude of public actors involved. Several sectoral plans have been put in place. The complementarity and coordination between these different sectoral plans and actors remain incomplete and the efforts made are dispersed, which leads to the desired results of public actions not being achieved.

Sectoral policies and strategies are generally carried out in isolation and without consultation between the parties concerned on the one hand, and without taking into account the resulting environmental repercussions on the other.

### **4 - A dashboard to monitor the evolution of the blue economy**

A set of specific indicators for monitoring the evolution of the blue economy in the Mediterranean is one of the important measures to ensure the good governance of the maritime space and the coast, and the rational exploitation of resources. maritime. In addition, the notion of the blue economy is still new and the work of collecting data and statistics associated with it is still evolving around the world.

## **IX.**

# **Conclusions**

## IX. Conclusions

After having presented all the main measures to be taken into account, the following recommendations seem necessary in order to ensure a desirable transition towards a sustainable blue economy.

### **1 - Have a good understanding of the potential existing in the marine environment.**

This recommendation aims to encourage investment in the field of exploration of the maritime environment in order to acquire a good knowledge of the underwater relief, the existing maritime wealth, the environmental issues related to biological diversity and the impacts associated with the activities human.

Marine renewable energy, such as tidal and wave power, has significant potential as a sustainable source of energy in the Mediterranean region. However, there is a need to boost its exploitation in a sustainable way to reduce the reliance on fossil fuels and achieve carbon neutrality goals

### **2 - Protect biological diversity and the marine environment by creating Marine and Coastal Protected Areas (AMCP).**

This recommendation underlines the importance of the method of protection adopted to deal with such a situation, in particular the creation of marine and coastal protected areas (MCPA). Indeed, the protection of maritime biological diversity has increasingly become a key issue in any future maritime action to deal with the increasing intensity of the use of natural resources and the alarming spread of maritime pollution and its enormous environmental impact.

In addition to the strategies mentioned earlier, the creation of transboundary marine protected areas (MPAs) and Other Effective Area-Based Conservation Measures (OECMs) can also play a crucial role in the sustainable exploitation of marine renewable energy in the Mediterranean region.

Transboundary MPAs are marine areas that extend across national borders, established to protect and conserve marine ecosystems and biodiversity. These areas can serve as a tool to harmonize conservation efforts across borders, promote cooperation among neighboring countries, and help prevent overfishing and other harmful activities that could negatively impact marine renewable energy development.

The establishment of such areas is considered as a privileged instrument for the protection of marine species and ecosystems, which consequently promotes the reconstitution of the biomass of living species, the management of fishery resources, as well as the implementation of best practices in integrated maritime space management.

The importance of creating more marine protected areas also extends to creating socio-economic benefits in various ways in which they help to secure the livelihoods of fishers and provide new opportunities, in particular for alternative and sustainable tourism.

### **3 - Ensure rational exploitation of fishery resources.**

The major challenge is the fight against the spread of illegal fishing. It is recommended at this level to monitor and control the movements of fishing vessels by generalizing the use of the satellite monitoring system for vessels.

### **4 - Diversify the tourist offer and promote ecotourism and cultural tourism.**

It is recommended to enhance the natural landscape of the coastal countries, the cultural heritage and the archaeological sites in order to diversify the tourist offer in order to partly get out of the model of seaside tourism and reduce its impact on the environment. The idea is to put in place strategies that form the identity of the countries (history, culture, environment etc.) vis-à-vis tourist flows to make known the beautiful places of the interior and coastal regions of the Mediterranean countries.

### **5 - Promote cruise and pleasure tourism.**

Cruise and yachting tourism are among the maritime activities closely linked to the blue economy that generate significant revenue. They contribute significantly to the creation of direct and indirect employment.

Cruise ships can generate economic benefits for local businesses, create job opportunities, and bring in revenue for the destination.

Thus, it is recommended to develop cruise tourism by identifying the necessary criteria for the development of cruise activity on the one hand, and to develop pleasure tourism by simplifying the procedures for the temporary admission of pleasure boats.

It is also recommended to adopt dry ports to protect the coastal environment. Indeed, dry ports present a solution to the sustainability of space and offer an efficient organization that reduces the maintenance costs of the boat, which remains less time in contact with the sea water, in particular the expenditure on the antifouling that destroy fauna and flora in ports, and the treatment of ships can be carried out with reduced frequency<sup>9</sup>



## **6 - Diversifying energy sources and adapting to the energy transition**

The world is moving towards an energy future less and less dependent on fossil fuels. This rapidly progressing global energy transition is accompanied by a decline in demand for petroleum resources, which leads to a long-term decline in oil prices, which necessitates the adoption of ocean renewable energies as described above (European Commission, 2023).

## **7 - Promote research, awareness, information and capacity building**

There is a clear need to strengthen the knowledge of the general public on the basic concepts and the issues and risks related to climate change and education on blue chains. The subject of climate change is a fundamental work, and is necessary to constitute a core of specialized media, which would relay information in this field.

## **8 - Better consideration of climate change in coastal zone management**

Capacity building on the choice of the most appropriate technologies is one of the immediate needs of Mediterranean countries to fight against climate change. In addition, facilitating access to the latest knowledge and participation in research and in-depth studies is one of the priority needs of countries.

## References

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Blue Growth Interreg MED (2019). Available at 21/7/2021, on: Blue Growth (interreg-med.eu) CCIAA (2017) Sesto rapporto sull'Economia del Mare. Latina. Retrieved at: [www.unioncamere.gov.it/PDF/rapporto-unioncamere-sull-economia-del-mare-2017\\_3525.htm](http://www.unioncamere.gov.it/PDF/rapporto-unioncamere-sull-economia-del-mare-2017_3525.htm) <http://www.blumed-initiative.eu> [www.oecd.org/greengrowth/](http://www.oecd.org/greengrowth/)

DFW-MoA (Department of Fisheries & Wildlife-Ministry of Agriculture). 2013. Country Profile. Internal report, cited in: "Assessment study on governance framework for fisheries in the Caza of Tyr, South Lebanon" [https://www.iucn.org/sites/dev/files/content/documents/annex\\_4.3.1.pdf](https://www.iucn.org/sites/dev/files/content/documents/annex_4.3.1.pdf).

European Commission, 2023. Renewable energy. [https://energy.ec.europa.eu/topics/renewable-energy\\_en](https://energy.ec.europa.eu/topics/renewable-energy_en).

Hassan, G. 2011. The National Wind Atlas of Lebanon. A study prepared for the UNDP CEDRO Project, UNDP-CEDRO, Beirut. 11 pp.

SDATL, 2004 Schéma Directeur d'Aménagement du Territoire Libanais, Rapport Final. DAR - IAURIF L0215-RPT-10 REV A. Mai 2004

Moyer, K. J., Rife, A., & Moyer, K. J. (2015). The potential for global fish recovery: how effective fisheries management can a more sustainable future. Recuperado de <http://ocean council.org/wp-content/uploads/2016/05/Smart-Ocean-Smart-Industries-Workshop-Report-FINAL-1.pdf>

Shaban, A. 2020. Water Resources of Lebanon. Springer Nature Switzerland. 229 pp. Blue Economy in the Mediterranean - UFM. (n.d.). Retrieved November 8, 2021, from [https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS\\_Blue-Economy\\_Report.pdf](https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS_Blue-Economy_Report.pdf)

World Bank Group. (2021, April 02). Tunisia's economic update - April 2021. Retrieved November 09, 2021, from <https://www.worldbank.org/en/country/tunisia/publication/economic-update-april-2021>

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