UN environment programme | Mediterranean Action Plan Barcelona Convention

THE MEDITERRANEAN SEA

MED QSR 2023

1. The Mediterranean Sea

Environmental characteristics

The Mediterranean marine and coastal environment

32. The Mediterranean is a semi-enclosed sea located between Africa, Asia and Europe and is bordered by twenty-one countries. It is connected to the Atlantic through the Strait of Gibraltar, to the Black Sea through the Strait of Dardanelles, and to the Red Sea through Suez Canal.

33. Although representing only 0.82% of the surface area of all oceans, with a total surface area of about 2.9 million square kilometres, the Mediterranean is the largest enclosed sea on Earth. According to the Barcelona Convention, the Mediterranean Sea is "bounded to the West by the meridian passing through Cape Spartel lighthouse, at the entrance of the Straits of Gibraltar, and to the East by the southern limits of the Straits of the Dardanelles between Mehmetcik and Kumkale lighthouses".

34. The Western Basin of the Mediterranean Sea has a narrow and fragmented continental shelf and a maximum depth of 2850 m, while the Eastern Basin is characterized by a relatively wide continental shelf, and it includes the deepest part of the Mediterranean (5267 m).

35. Apart from the coastal plains along the eastern Mediterranean coasts of Egypt, Libya and Tunisia, and the deltaic zones of large rivers (e.g., Ebro, Rhone, Po and Nile), the geomorphology of the Mediterranean coasts is characterised by an irregular, deeply indented coastline, especially in the north, and the presence of mountain ranges: the Atlas, the Rif, the Baetic Cordillera, the Iberian Cordillera, the Pyrenees, the Alps, the Dinaric Alps, the Hellenides, the Balkan, and the Taurus.

36. The most striking feature of the underwater geomorphology of the Mediterranean Sea is the presence of abrupt submarine canyons linking the coastal areas to the deep sea. They facilitate exchanges between coastal waters and deep waters and form essential habitats for several species by providing a place of refuge, nursery and export to the continental shelf for many species (fish larvae, decapods, cetaceans, etc.).

37. The presence of numerous islands is another striking characteristic of the Mediterranean. According to some reports there are about ten thousand islands in the Mediterranean, most of them are in the Aegean Sea. The largest islands are Sicily, Sardinia, Corsica, Cyprus, and Crete, and the major island groups include the Balearics off the coast of Spain and the Ionian, Cyclades, and Dodecanese islands off Greece.

Sea water masses and circulation:

38. The average annual sea surface temperature in the Mediterranean show strong gradients from west to east and from north to south, as well as a strong seasonal variation between 10 and 28°C, reaching 30°C in summer. This sea is considered a warm temperate sea. It is characterized by high salinities, temperatures and densities. Its deep waters have a constant temperature around 13°C with an average salinity of 38‰. The Mediterranean water column is made of a surface layer, an intermediate layer and a deep layer that sinks to the bottom. The evaporation water losses are partially compensated by the rivers that flow into the Mediterranean and a surface current from the Black Sea through the Bosporus, the Sea of Marmara, and the Dardanelles. The main compensation of evaporation losses is provided by a continuous inflow of surface water from the Atlantic Ocean through the Strait of Gibraltar. The current it generates is the main driver of the water circulation in the Mediterranean. It flows eastward along the southern coasts of the western basin, then across the Sicily Strait and continues along the southern coasts of the eastern basin.

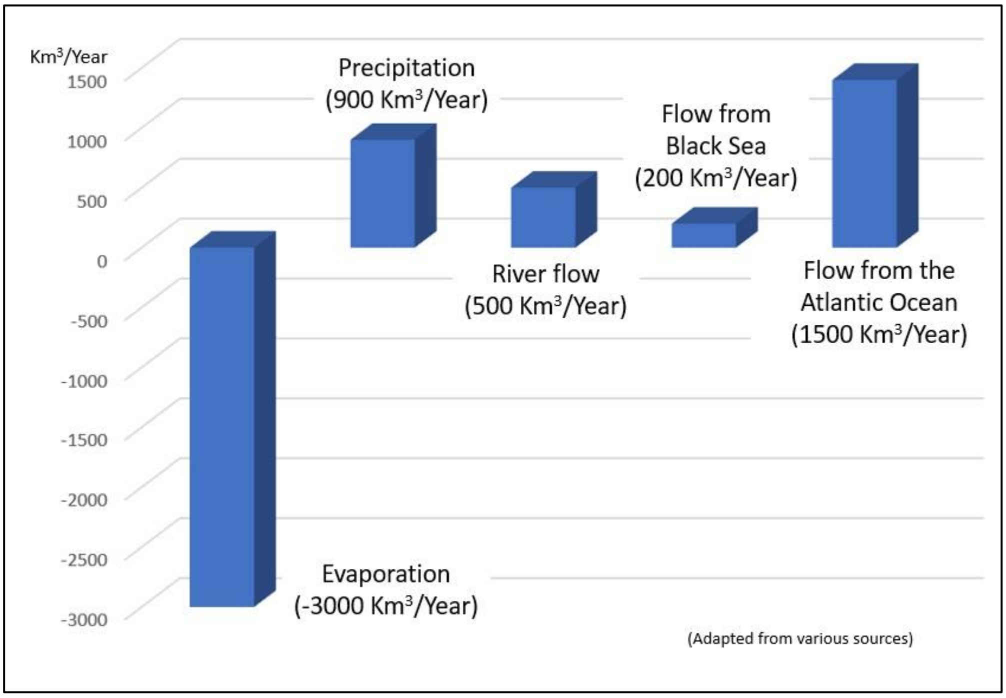

Figure 1: Annual hydrological balance of the Mediterranean Sea

39. With a low amplitude of semi-diurnal tides (30-40 cm), except for the northern Adriatic and the Gulf of Gabes where it can reach up to 150 and 180 cm, respectively, the Mediterranean Sea is considered a medium microtidal sea by global ocean standards.

Trophic level:

40. In terms of nutrients, the Mediterranean is among the most oligotrophic oceanic systems. The most eutrophic waters are located on the north shore in the western basin and Adriatic at the mouth of the large rivers Rhone, Ebro and Po. However, riverine nutrient inputs are relatively low, as most river systems discharging in the Mediterranean Sea are small. The main source of nutrients in the Mediterranean lies in the inflowing Atlantic surface waters at the level of the Gibraltar Strait. As the waters move eastwards from the Gibraltar Strait, they become depleted in nutrients. By the time they reach the Egyptian coasts, their nutrient signature has almost disappeared. Additionally, the Nile River nutrient signature has disappeared due to the 1960s Nile Dam construction. All this contributes towards making the Levantine Basin (at the eastern part of the Mediterranean Sea) one of the most oligotrophic areas in the world ocean. The outflow of Black Sea surface waters constitutes another source of nutrients to the Mediterranean, but its influence is limited to the north Aegean zone.

Biodiversity:

41. Home to 17,000 species of fauna and flora representing respectively 7.5% and 18% of the world's marine flora and fauna, the Mediterranean Sea is a hotspot of biodiversity. The evolution of the Mediterranean marine fauna and flora over millions of years in a unique mixture of temperate and subtropical species gives this almost closed sea the second place in the world in terms of endemic species richness with more than a quarter of its species found nowhere else on Earth.

42. The species diversity of the Mediterranean, although unevenly distributed between the eastern and western basins, is higher than in most other regions of the world, due to the geological history of this sea, its close communication with the Atlantic and its position at the junction of three continents Europe, Asia and Africa which make it a melting pot of biodiversity.

43. The uniqueness of the Mediterranean biotope comes from a combination of morphological, chemical and biotic characteristics reflected by the presence of certain ecosystem building species and assemblages. The meadows formed by *Posidonia oceanica* and the bioconcretions of the coralligenous assemblages are among the most important marine ecosystems of the Mediterranean Sea. They provide a wide range of ecosystem services and sustain many human activities such as fisheries and tourism. They are, however, particularly sensitive and vulnerable to coastal urbanization, pollution, turbidity, anchorages, trawling, etc.

44. The shallow coastal waters are home to key species and sensitive ecosystems such as seagrass beds and coralligenous assemblages, whilst the deep waters host a unique and fragile fauna. Many of these species are rare and/or threatened and are globally or regionally classified by IUCN as "endangered" or "critically endangered", such as the monk seal *Monachus monachus*, the Mediterranean shellfish *Pinna nobilis* and cartilaginous fish species (sharks and rays). Many other species have strongly regressed during the 20th century.

45. Non-indigenous and invasive species (NIS) are increasingly present in the Mediterranean Sea. As of 2020, more than 1,199 non-indigenous species have been reported in the Mediterranean Sea, 513 of which are considered as established. The highest number of established alien species has been reported in the eastern Mediterranean, whereas the lowest number was recorded in the Adriatic Sea. Of those established species, 107 have been flagged as invasive.

46. The NIS in the Mediterranean Sea are linked to four main pathways of introduction: the corridors, shipping (ballast waters and hull fouling), aquaculture, and aquarium trade. Corridors are the most important pathway of introduction (33.7%) followed by shipping (29%) and aquaculture (7.1%).

47. The vast majority of the marine NIS recorded in the Mediterranean have their native distribution in the Western and Central Indo-Pacific and Red Sea, being mostly associated with introductions into the Mediterranean Sea through corridors.

48. In 2021, the number of Marine and Coastal Protected Areas (MCPAs) recorded in the MAPAMED (**Error! Reference source not found.**) database reached 1,126 sites covering 209,303 km², including only 0.06% of strictly protected areas. There are no other effective area-based conservation measures (OECMs) reported for the Mediterranean to date; however, combining areas that could be potential OECMs (i.e., 1 Particularly Sensitive Sea Area and 8 Fisheries Restricted Areas) the total MCPA and potential OECM coverage currently stands at 9.3% of the Mediterranean Sea. As shown in **Error! Reference source not found.**, there is a large disparity in MCPA coverage between countries, with the majority of MCPAs occurring in the western Mediterranean Sea and 90.05% occurring in in the northern part of the Mediterranean. In addition to geographical representation, there is also uneven distribution of MPAs according to sea depth, with less than 4% of depths greater than 1,000 m covered by MPAs. As the region now faces new targets, not only is coverage expected to increase, but it is essential that coverage is more equitably represented across Contracting Parties and the different ecosystems.

Climate change:

49. The Mediterranean region climate is characterized by mild winters and hot and dry summers. From the West, the Atlantic Ocean regimes have a great intra-seasonal and interannual variability influences in the Mediterranean reaching mainly the northeast part of the Mediterranean land and sea, whilst the Eastern and Southern climatic regimes provide the characteristics of the southern Mediterranean areas.

50. Climate change is one of the most critical challenges that the Mediterranean region is facing. In its Sixth Assessment Report the IPCC concluded that "during the 21st century, climate change is projected to intensify throughout the region. Air and sea temperature and their extremes (notably heat waves) are likely to continue to increase more than the global average (high confidence)". The report

predicted (i) a decrease in precipitation in most areas by 4–22%, depending on the emission scenario, (ii) a further rise in the Mediterranean Sea level during the coming decades and centuries, likely reaching 0.15 to 0.6 m in 2050 and 0.6 to 1.1 m in 2100 (relative to 1995–2014) and the process is irreversible at the scale of centuries to millennia; (iii) coastal flood risks will increase in low-lying areas along 37% of the Mediterranean coastline with an increase in the number of people exposed to sea level rise, especially in the southern and eastern Mediterranean region, and may reach up to 130% compared to present in 2100; (iv) ocean warming and acidification will impact marine ecosystems, with however uncertain consequences on fisheries.

51. For the marine environment, the available data indicates that since the 1980's, documented impacts on marine Mediterranean species and habitats were attributed to climate change. These included frequent and drastic mortalities of sessile benthic species of the infralittoral and circalittoral communities. For the deeper Mediterranean ecosystems, recent scientific articles reported that in the 1990's, Climate change caused an accumulation of organic matter on the deep-sea floor and altered the carbon and nitrogen cycles.

52. By affecting all trophic levels, the Climate Change may alter the distribution of some species as a response to changes in the availability of their preys. Indications were reported about shifts in the distribution and density of cetacean species in relation to variations of sea surface temperature (SST). Furthermore, the rise in seawater temperature has the potential to favour pathogen development and transmission. It is also an accelerating factor for the introduction and spread of non-indigenous species. The thermal stress it generates on the native species make them weaker competitors which favours the establishment and growth of non-indigenous species populations in their habitats.

53. The consequences of climate change in the Mediterranean are especially manifested through hydrographic alterations of the Mediterranean Sea, which is explained in detail in the last Copernicus Ocean State Report – 6th issue (2022) and the MedECC 2020 First Mediterranean Assessment Report (MAR1, MedECC 2020).

54. Taking advantage of the freely available high-resolution satellite-derived sea surface temperature dataset from the Copernicus Marine Environment Monitoring Service, that covers the longest period, it could be observed that the surface temperatures in the Western Mediterranean Sea have been rising over the last 39 years with an average rate of 0.036°C yr-1 (Krauzig et al., 2022; according to Pisano et al. 2020).

55. Over the last three decades, **marine heatwaves** (MHWs) in the Mediterranean Sea have caused mass-mortality events in various marine species, and critical losses for seafood industries. Three different sea surface temperature products (Copernicus Marine datasets) show that the maximum intensity, frequency and duration of MHWs have all increased on average over the Mediterranean Sea since 1993.

56. Based on the satellite observations over the 1993–2019 period, the number of MHWs showed an inhomogeneous spatial distribution in the entire Mediterranean Sea, with a lower number of events per year in the south-eastern Mediterranean Sea and slightly more events in the western Mediterranean Sea, especially in the north-western area, as well as the Adriatic Sea (Dayan et al., 2022). On average, the number of MHWs substantially increased across the entire Mediterranean Sea by approximately 1 event per decade. The number of MHWs increased significantly in distinct ways in the four sub-regions (Figure 2). Satellite observations show that the number of MHWs has increased the most in the Adriatic Sea (1.61 ± 0.17 per decade), followed by the Aegean Sea (1.30 ± 0.23 per decade), the western Mediterranean Sea (1.13 ± 0.12 per decade) and finally the eastern Mediterranean Sea (1.01 ± 0.14 per decade). Satellite observations reveal that the duration of moderate and strong MHWs increased the most in the Adriatic Sea (23.01 days ± 2.67 and 3.22 ± 0.53 days per decade, respectively), while the duration of severe and extreme MHWs increased the most in the Aegean Sea (0.59 ± 0.18 days per decade) and the western Mediterranean Sea (0.53 ± 0.15 days per decade).

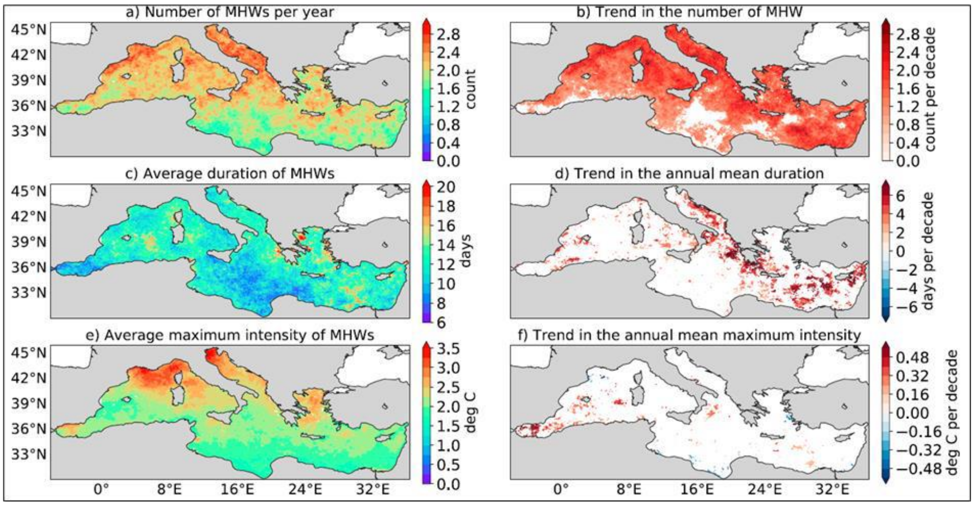

Figure 2: Spatial distribution of the marine heatwave (MHW) metrics from satellite-derived SST record over the period 1993–2019
Source: Dayan et al., 2022

57. In the future, MHWs may undermine many benefits and services that Mediterranean ecosystems normally provide, such as food, maintenance of biodiversity, and regulation of air quality (Dayan et al., 2022, Martín-López et al. 2016). MHWs are predicted to become more intense and more frequent under anthropogenic warming, embodying a growing threat to both marine ecosystems and human society (Dayan et al., 2022).

58. The annual 99th percentile of **significant wave height** (SWH) – a measure of extremes – has increased almost everywhere in the basin during the last 28 years at a maximum rate of 0.026 m yr^{-1}. The most significant upward trends were found in the south-eastern Levantine and eastern Alboran Seas (Figure 3: Long-term 99th percentile of SWH in meters (1993–2020)), followed by the Adriatic Sea and contained areas of the Tyrrhenian (Zacharioudaki et al., 2022).

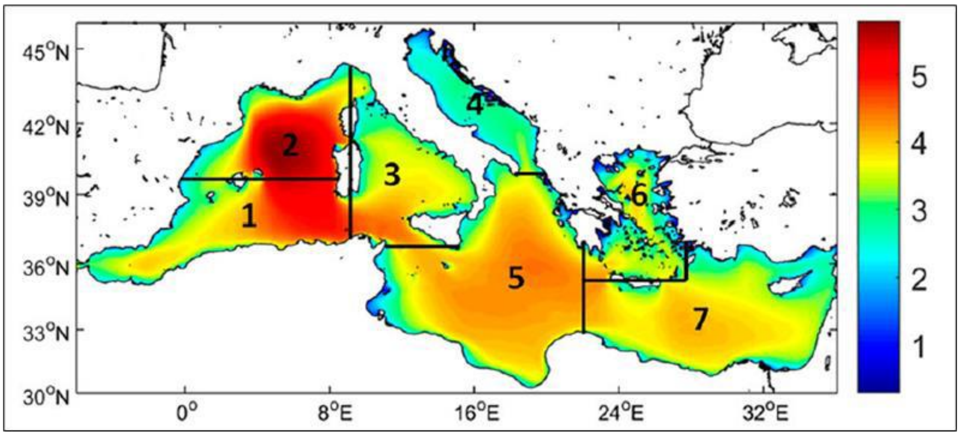

Figure 3: Long-term 99th percentile of SWH in meters (1993–2020)
Source: Zacharioudaki et al., 2022

59. The **water mass temperature and salinity** changes of the water outflowing from the Mediterranean Sea through the Strait of Gibraltar are 0.077°C $decade^{-1}$ and 0.063 Practical Salinity Scale (PSS)decade-1, respectively, compared to 2004 (MedECC, 2020).

60. Mediterranean Sea water **surface pH** has decreased by -0.08 units since the beginning of the 19th century, similar to the global ocean, with deep waters exhibiting a larger anthropogenic change in pH than the typical global ocean deep waters because ventilation is faster (MedECC, 2020). Nutrient enrichment causes eutrophication and may provoke harmful and toxic algal blooms, trends which will likely increase. Harmful algal blooms may cause negative impacts on ecosystems (red-tide, mucilage

production, anoxia) and may present serious economic threats for fisheries, aquaculture and tourism (MedECC, 2020).

61. As a result of increasingly pronounced hydrographic alterations, the marine habitats in the Mediterranean Sea are increasingly endangered, and some of them are threatened with complete extinction. It stands out in particular for the Adriatic Sea where current climatological and oceanographic research (Bonacci and Vrsalović, 2022; Mihanović et al., 2021; Pastor et al., 2018; Šepić et al., 2021; Vilibić et al., 2013; Vilibić et al., 2019; Vilibić et al., 2022) indicates that the Adriatic Sea is already experiencing significant changes in hydrographic alterations, and their intensity will become more and more pronounced, while the occurrence of climatological extremes could increase.

Socioeconomic characteristics

Unsustainable consumption and production patterns are the main drivers of environmental change in the Mediterranean

62. Current consumption and production patterns in the Mediterranean are characterised by high resource consumption combined with low recycling rates and unsatisfactory waste management. They are unsustainable overall and lead to considerable environmental degradation in the Mediterranean region, including land take and degradation, water scarcity, noise, water and air pollution, biodiversity loss and climate change (UNEP/MAP and Plan Bleu, 2020).

63. Achieving a high level of development is historically linked to environmental trade-offs. Figure 4 shows that none of the Mediterranean countries has both a high level of human development and an Ecological Footprint that lies within the planetary boundaries. The challenge ahead is to move all countries into the Sustainable Development Quadrant of the figure. Strategies to achieve this goal need to be differentiated: countries with a low Ecological Footprint and low Human Development Index (HDI) need to find solutions to increase HDI without increasing their Ecological Footprint. Countries with a high HDI and high Footprint need to find solutions to maintain high HDI but decrease their Footprint[4].

[4] Note that **Error! Reference source not found.** does not make indications about the state of the rule of law, respect of civil rights and equality, that should also be included in a measure of inclusive sustainable development and resilience.

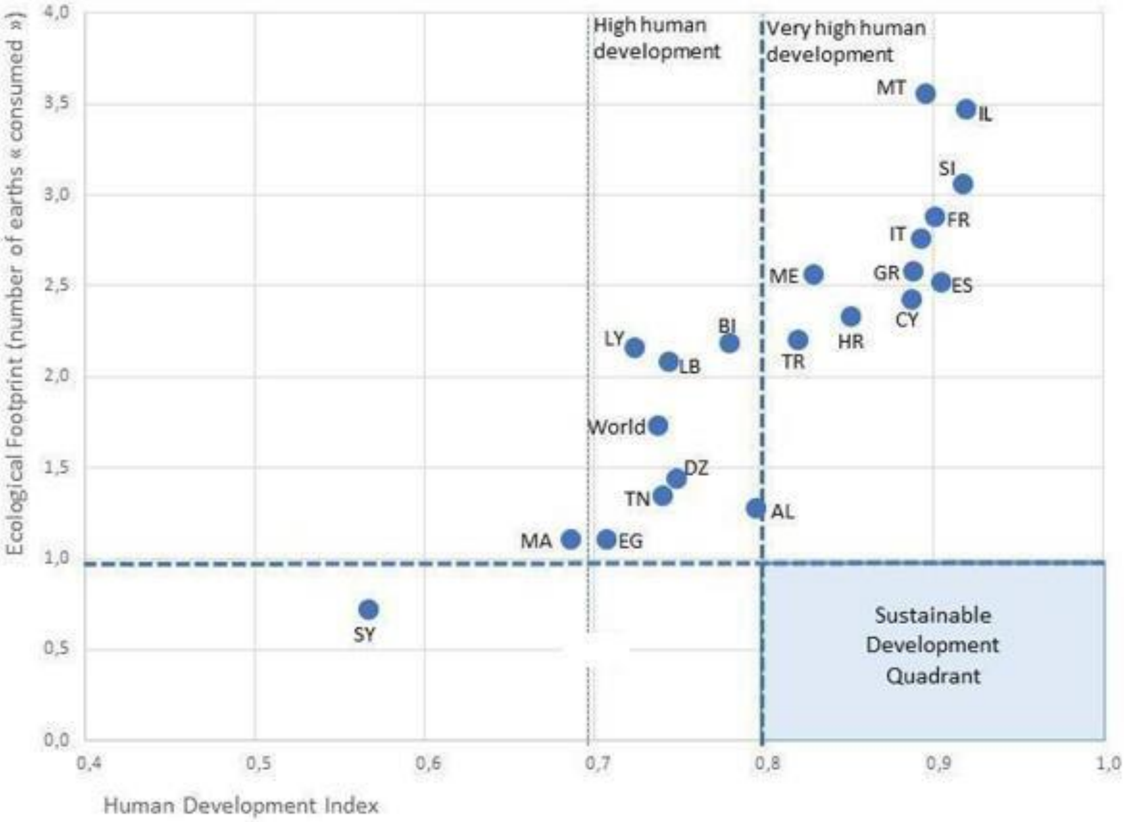

Figure 4: Ecological Footprint 2017 and Human Development Index (HDI) 2019 in Mediterranean countries
(Source: Graph by Plan Bleu, inspired by Wackernagel et al., 2017. Data from Global Footprint Network, 2021 and UNDP, Human Development Report 2020).

Ecological Footprint

64. The ecological deficit in the Mediterranean countries is twice as high as the global average, meaning that Mediterranean countries consume approximately 2.5 times more natural resources and ecological services than the region's ecosystems can provide (Akcali et al, 2022). The gap between the Mediterranean and the world averages remained substantial: an Ecological Footprint[5] of 3.4 global hectares per capita is found in the Mediterranean, as compared to 2.8 globally in 2018.

65. Ecological Footprint ranges from 1.1 to 5.5, with ecological deficits assessed for all Mediterranean countries. Countries with the highest ecological deficit are the two island states (Malta and Cyprus), but also Israel, Italy and Slovenia. Over the past 15 years, the Ecological Footprint has been mainly on the rise in southern and eastern Mediterranean countries (SEMC), with the exception of Syrian Arab Republic and Libya, as well as in Bosnia and Herzegovina and Montenegro, and declining in the EU Mediterranean countries, most notably in Cyprus, Spain, Italy and Greece, as well as in Israel. A slight decline was also seen in other EU countries, whereas stagnation was recorded in Egypt, Albania and Tunisia.

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[5] The Ecological Footprint measures how much biocapacity humans demand, and how much is available. It does not address all aspects of sustainability, nor all environmental concerns. Biocapacity is the area of productive land available to produce resources or absorb carbon dioxide waste, given current management practices. Global hectares (gha) is a unit of world-average bioproductive area, in which the Ecological Footprint and biocapacity are expressed.

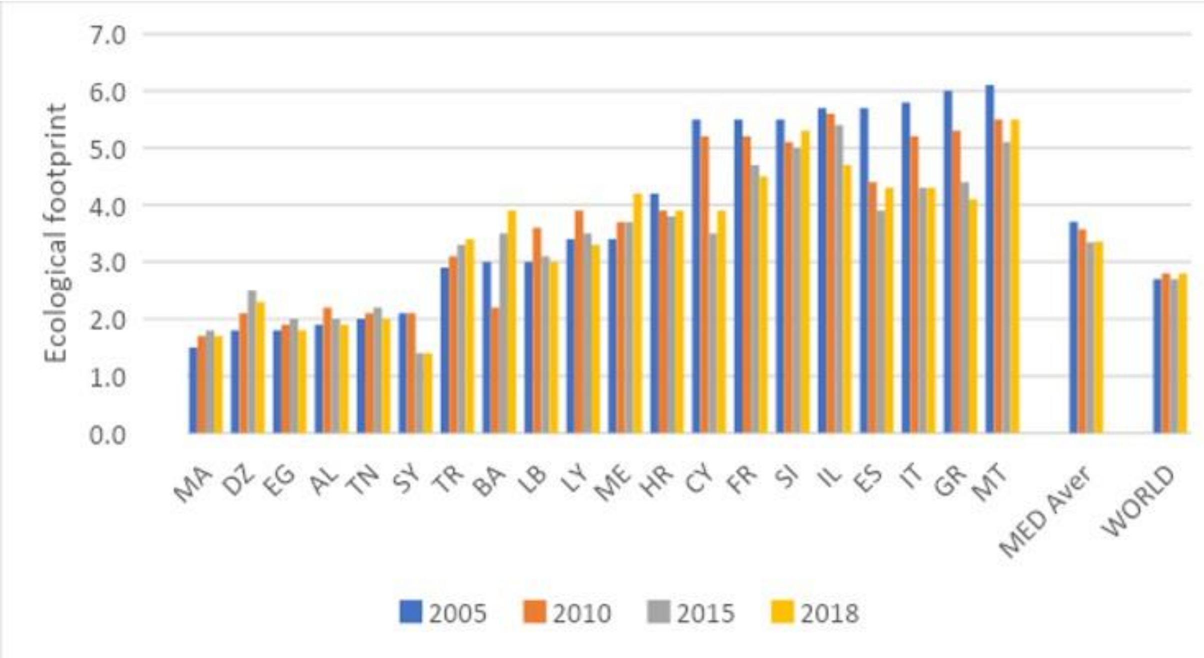

Figure 5: Ecological Footprint of the Mediterranean countries 2005 – 2018.
(Source: Global Footprint Network, York University, FoDaFo (2022). National Footprint and Biocapacity Accounts, 2022 Edition)

Human development and gender equality

66. Sixteen Mediterranean countries rank at or above the world average of human development as measured by the HDI (world average of 0.732). Countries with the highest HDI values include Israel, the EU Mediterranean and Western Balkan countries and Türkiye, followed by Algeria, Egypt and Tunisia. Libya, Lebanon, Morocco and the Syrian Arab Republic have HDIs lower than the world average, ranking between 104th and 150th.

Table 2: Human development and gender inequality indexes (GII) with related indicators, 2021. SDG: Sustainable Development Goals.

Countries	Human Development Index (value)	HDI rank	Mean years of schooling (SDG 4.4)	Gender inequality index (value)	GII rank	Adolescent birth rate [a)] (SDG 3.7)	Share of parliament seats held by women (SDG 5.5)
AL	0.796	67	11.3	0.144	39	14.5	35.7
DZ	0.745	91	8.1	0.499	126	11.7	7.5
BA	0.780	74	10.5	0.136	38	9.9	24.6
HR	0.858	40	12.2	0.093	26	8.6	31.1
CY	0.896	29	12.4	0.123	35	6.8	14.3
EG	0.731	97	9.6	0.443	109	44.8	22.9
FR	0.903	28	11.6	0.083	22	9.5	37.8
GR	0.887	33	11.4	0.119	32	8.5	21.7
IL	0.919	22	13.3	0.083	22	7.6	28.3
IT	0.895	30	10.7	0.056	13	4.0	35.3
LB	0.706	112	8.7	0.432	108	20.3	4.7
LY	0.718	104	7.6	0.259	61	6.9	16.0
MT	0.918	23	12.2	0.167	42	11.5	13.4
MC	--	--	- -	--	--	--	--
ME	0.832	49	12.2	0.119	32	10.4	24.7

Countries	Human Development Index (value)	HDI rank	Mean years of schooling (SDG 4.4)	Gender inequality index (value)	GII rank	Adolescent birth rate a) (SDG 3.7)	Share of parliament seats held by women (SDG 5.5)
MA	0.683	123	5.9	0.425	104	25.9	20.4
SL	0.918	23	12.8	0.071	18	4.5	21.5
ES	0.905	27	10.6	0.057	14	6.3	42.3
SY	0.577	150	5.1	0.477	119	38.7	11.2
TN	0.731	97	7.4	0.259	61	6.7	26.3
TR	0.838	48	8.6	0.272	65	16.9	17.3
WORLD	**0.732**	**--**	**8.6**	**0.465**	**--**	**42.5**	**25.9**

NOTES: a) Births per 1,000 women ages 15–19. (Source: https://hdr.undp.org/data-center/documentation-and-downloads (accessed November 2022)).

67. Women disproportionately suffer the impacts of climate change and other environmental hazards, especially in developing countries. To achieve inclusive sustainable development, it is vital to achieve gender equality. A gender gap persists in all Mediterranean countries. Gender inequality, as measured by the Gender inequality index (GII)[6], is highest in Algeria, Syrian Arab Republic, Egypt, Lebanon and Morocco. Mediterranean countries that get closest to gender equality, without however reaching equality, are Italy, Spain and Slovenia. A third or more seats in the national parliaments are held by women in just a few countries – Spain, France, Albania and Italy (SDG indicator 5.5). Among the SEMC, relatively high participation of women in the national assemblies is found in Israel, Tunisia, Egypt and Morocco. The share of female members of parliament is relatively low in Cyprus and Malta. The highest adolescent birth rates (SDG indicator 3.7) are found in Egypt.

Population as a multiplier of pressures on the coastal and marine environment

68. Population in the Mediterranean countries reached 531.7 million in 2021, increasing by close to 20 million people in only 3 years between 2018 and 2021 (UN DESA Population Division, 2022). An overall increase of 41.4% was recorded between 1990 and 2021, while decade-on-decade growth accelerated (from a rate of 12.5% between 1990 and 2000, to 13.5% between 2000 and 2010 and 17.2% for the last decade). Human-caused pressures on the coastal and marine environment are stemming from unsustainable production and consumption patterns, and a growing population multiplies these pressures, unless incremental population increase comes with sustainable lifestyles.

69. The most populated countries are Egypt (109.3 million in 2021) followed by Türkiye (84.8 million), France (64.5 million), Italy (59.2 million) and Spain (47.5 million). Montenegro, Malta and Monaco count less than a million inhabitants. Monaco is the most densely populated country with 24,622 inhabitants per square kilometer. Other densely populated countries are Malta, countries of the east Mediterranean coast (Lebanon and Israel), and Italy. Low population density (of 100 inhabitants per km^2 or less) is found in Spain, Morocco, Greece, Tunisia, Croatia, Bosnia and Herzegovina, Montenegro, Algeria (18 inhabitants/ km^2) and Libya (4 inhabitants/ km^2). These are national averages, and it must be noted that settlements tend to concentrate in the coastal zones of Mediterranean countries, where population density is thus generally higher than the national average. In this sense, population can be seen as a concentrator of human pressures on the coastal and marine environment.

[6] GII is a composite metric of gender inequality using three dimensions: reproductive health, empowerment and the labour market. A low GII value indicates low inequality between women and men, and vice-versa.

Table 3: Key demographic data, 2021.

Countries	Median age of population (years)	Population change prev. yr., (in 000)	Population density (inhab./ km²)	Total population (in 000)	Popul. % change '21/'01	Total net-migration (in 000)	Life expectancy at birth (years)
AL	37.27	-13.71	104.19	2,854.71	-9.5	-10.61	76.46
DZ	27.80	731.25	18.55	44,177.97	41.6	-18.80	76.38
BA	41.82	-49.80	63.89	3,270.94	-22.0	-25.87	75.30
HR	43.73	-37.93	72.64	4,060.14	-9.9	-10.40	77.58
CY	37.59	5.78	134.65	1,244.19	29.0	2.00	81.20
EG	23.94	1,741.26	109.76	109,262.18	50.0	-32.37	70.22
FR	41.59	58.20	117.04	64,531.44	9.3	20.61	82.50
GR	44.74	-71.51	79.85	10,445.37	-5.7	-14.81	80.11
IL	29.04	141.35	411.22	8,900.06	42.7	16.86	82.26
IT	46.83	-241.86	200.15	59,240.33	3.9	28.02	82.85
LB	28.27	-77.39	546.69	5,592.63	27.4	-115.12	75.05
LY	26.27	78.84	4.02	6,735.28	27.7	-0.70	71.91
MT	39.01	11.25	1,672.22	526.75	31.0	10.41	83.78
MC	54.52	-0.25	24,621.48	36.69	13.1	0.21	85.95
ME	38.19	-0.69	45.46	627.86	-0.8	-0.10	76.34
MA	28.67	375.77	83.08	37,076.59	28.2	-46.24	74.04
SL	43.20	0.76	105.24	2,119.41	6.9	4.57	80.69
ES	43.88	178.55	94.53	47,486.94	15.9	275.02	83.01
SY	20.94	530.44	116.08	21,324.37	27.5	212.19	72.06
TN	31.74	91.50	78.90	12,262.95	22.7	-9.19	73.77
TR	30.93	632.46	110.15	84,775.40	30.3	-69.73	76.03
TOTAL MED				**531,685.56**	24.3		

Source: UN DESA, Population Division (2022); own calculations

70. Decreases in population (on a year-by-year basis) have been recorded for some time sequences or the entire period since 2000 in some of the Mediterranean countries. The downward population trend has been most consistent in Albania, Bosnia and Herzegovina (since 2002), Croatia (since 2005) and Montenegro (almost all years in the observed period), as well as in Greece (since 2005). Periodic population decreases during the last 20 years also characterise a few SEMC (Lebanon, Libya, Syrian Arab Republic) and can be correlated with periods of conflicts and crises[7]. Negative population growth was also seen in Italy (since 2014), Spain (in the period 2012 – 2015) and Monaco. In other Mediterranean countries, annual population changes during the past two decades were positive. With dominantly unsustainable lifestyles that are linked to negative environmental externalities (resource depletion, waste generation, etc.), fluctuations of population generally impact the weight of overall pressures on the coastal and marine environment, at varying levels depending on the per capita environmental footprint.

71. Cumulative population change rates 2001 – 2021 indicate population declined in Bosnia and Herzegovina (-22%), as well as in Croatia, Albania, Greece and Montenegro (by less than 10% and in case of Montenegro by less than 1%). Countries with the highest population growth (around 60% to

[7] E.g., Lebanon since 2015; Libya had a negative population balance of 0.74 million in 2011; Syrian Arab Republic in particular in the period 2012 – 2015.

40% respectively) were Egypt, Israel and Algeria; growth rates above the Mediterranean average (of 24.3%) were also recorded in Malta, Türkiye, Cyprus, Morocco, Libya, Syrian Arab Republic and Lebanon. Migration flows influence population numbers and move environmental pressures from one place to the other. In addition, human and natural disasters can cause spontaneous movement and displacement of large numbers of people. This may have significant impacts on the environment, such as deforestation and soil erosion, as well as depletion and pollution of water resources, impacting also the coastal and marine environment (UNHCR website, 2023).

Human activities interact with the marine environment

72. The relationship between maritime economic activities and the marine and coastal environment is characterised by impact and dependence. The maritime economy can foster the development of sustainable practices for livelihoods that depend on the sea and its resources. At the same time, if not properly managed, it can have environmental impacts that cause marine and coastal ecosystem degradation and hinder achievement of good environmental status (GES). In turn, degraded marine and coastal ecosystems provide fewer economic opportunities for those activities that depend on healthy ecosystems (fisheries, tourism, …). Other economic activities that heavily impact the marine environment can function independently from the state of the marine environment (maritime transport, offshore oil and gas, etc.).

73. In most Mediterranean countries, the regulation of maritime activities is still insufficient to make the maritime economy a sustainable blue economy, whether through legislation, monitoring or policing. This economic "openness" stands in contrast with the biological semi-closed character of the Mediterranean Sea (water renewal time of around 80 years). The fragmentation of policies, including within countries, and the persistence of insufficiently rigorous international standards, are hindering the implementation of regulation, monitoring and sanctioning measures, essential for the sustainable use of common resources.

74. A knowledge gap remains when it comes to measuring the sustainability of maritime economic activities and their individual contribution to the degradation of the environment. This chapter provides a qualitative analysis of this link, while further work on the monitoring and observation of the pressures caused by the maritime economy needs to be conducted, linking the Blue Economy with the Ecosystem Approach.

75. However, action to "close the tap" of impacts on the marine environment that stem from the maritime economy cannot wait for complete datasets on these impacts to be available. In application of the precautionary principle, a well-calibrated balance between the development of the maritime economy and increased protection and restoration of the Mediterranean environment is needed, through urgent and systemic regulatory action, in order to achieve a truly sustainable Blue Economy that is compatible with achieving GES in the Mediterranean.

Tourism

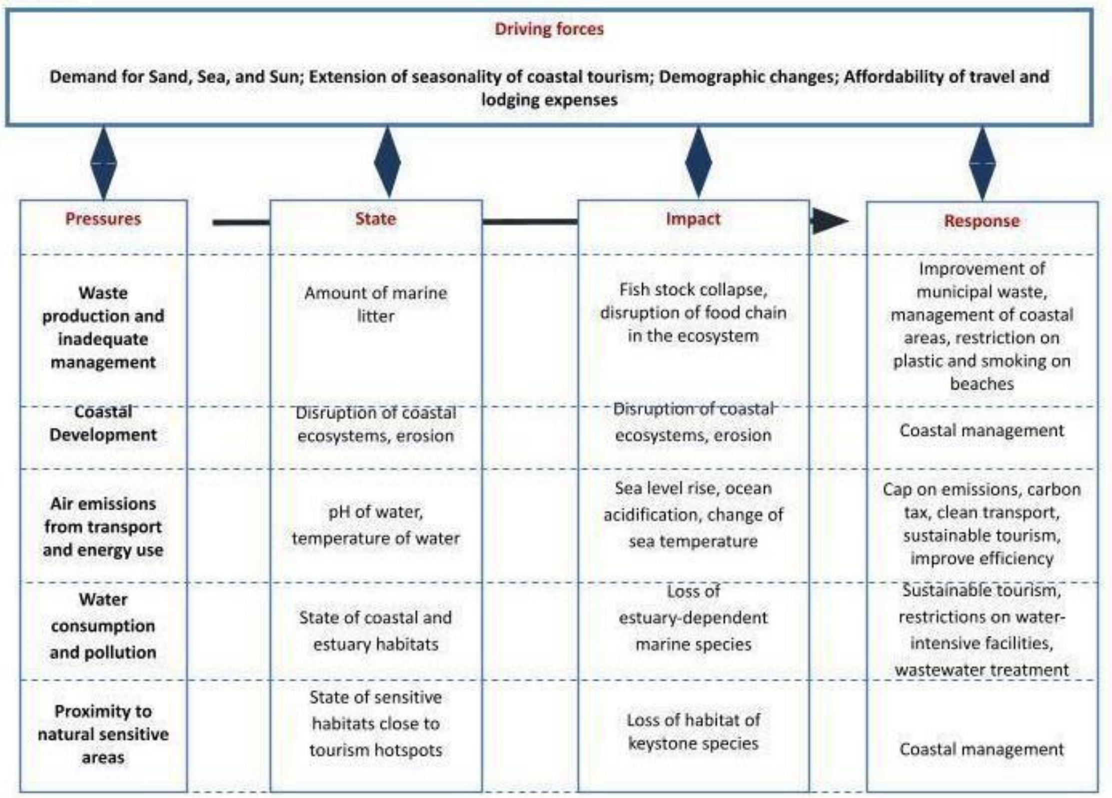

Figure 6: Pressures exerted by the tourism sector on the marine environment. (Source: UNEP/MAP and Plan Bleu, 2020).

76. Exceptional natural resources (including 46,000 km of coastline), cultural heritage, diversity of the region, its gastronomy and climate, coupled with favourable geographic location and good connectivity with the main source markets have all contributed to the Mediterranean becoming the world's leading tourism destination (UN World Tourism Organisation, UNWTO, 2015; UNEP/ MAP and Plan Bleu, 2020). Mediterranean destinations developed a rich and diverse set of tourism products, services and experiences, completing the traditional sun and sea attractions with health, sports, nature and culture as well as cruise and business tourism.

77. Data on tourism specifically related to the Mediterranean coastal region is generally not available and data contained in this chapter refers to national data (all marine façades included for countries with multiple marine façades).

Tourism in the Mediterranean: the key facts

- Over the past 50 years (1970 – 2019), the number of international tourist arrivals (ITAs) increased by a factor of seven: from around 58 million in 1970 (161 in 1995, 246 in 2005) to 408 million in 2019
- During the past decade (2010 – 2019), a cumulative increase of ITAs to the Mediterranean countries was 43.2%
- In 2019, close to one third (27.8%) of the global ITAs were recorded in the Mediterranean
- Tourism was severely affected by COVID-19 pandemic: the number of ITAs decreased by more than two thirds in 2020; a moderate recovery was seen in 2021, with total number of ITAs reaching 45.5% of the 2019 level
- According to pre-COVID-19 projections, the total number of ITAs was to reach 500 million by 2030
- A strong growth in receipts from international tourism was recorded, with the total amount almost quadrupling between 1995 (USD 81 billion) and 2019 (USD 308 billion); the receipts plunged in 2020 (-64.3% compared to 2019 level)
- Economic impact of tourism is strong: contribution of tourism and travel to GDP has been estimated by WTTC at USD 943.4 billion, with 18.4 million direct and indirect jobs across the region in 2019; the COVID-19 crisis halved the GDP from tourism and travel in the Mediterranean, causing a loss of 3.1 million jobs
- Ranking within the top five Mediterranean destinations did not change much over time; Türkiye and Greece were the fastest growing; the cumulative share of the top five destinations in total Mediterranean ITAs has been gradually decreasing due to emergence and development of new destinations across the region

1995	**2005**	**2019**
(88% of the Med ITAs)	(82% of the Med ITAs)	(79% of the Med ITAs)
France (60.0 mill)	France (75.0 mill)	France (90.9 mill)
Spain (33.0 mill)	Spain (55.9 mill)	Spain (83.5 mill)
Italy (31.1 mill)	Italy (36.5 mill)	Italy (64.5 mill)
Greece (10.1 mill)	Türkiye (20.3 mill)	Türkiye (51.2 mill)
Türkiye (7.1 mill)	Greece (14.8 mill)	Greece (31.3 mill)

(Sources: Plan Bleu, 2016; UNWTO, 2022 and 2022b; WTTC, 2022)

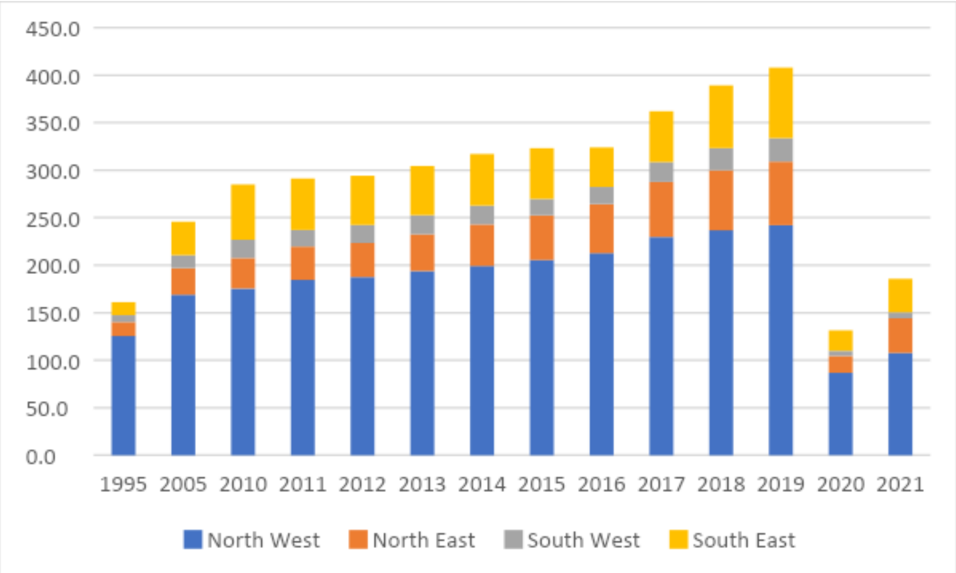

Figure 7: International Tourist Arrivals (ITAs) in the Mediterranean (in millions).
(Sources: Based on UNWTO 2022 and 2022b).

78. The overall number of ITAs in Mediterranean countries reached 408 million in 2019. During the past decade (2010 – 2019) alone, an average annual increase of 13.7 million ITAs (4.1% year-on-year) was recorded. While tourism in the established North West Mediterranean destinations (primarily France, Spain and Italy) remained predominant, their relative share in the total numbers of visits decreased by nearly 20 percentage points between 1995 and 2019. The share of fast-growing destinations from the South East and North East (in particular Türkiye, but also Albania, Croatia and Montenegro) in the overall number of tourists in the region has increased considerably, in particular during the past 15 years. The share of ITAs to North East Mediterranean countries, for example, increased from 11.4% in 2005 to 16.4% in 2019. Despite significant potential, the contribution of South West destinations to the overall Mediterranean ITAs remained modest (5 to 6%). In 2019, the Mediterranean earned close to USD 308 billion in international tourism receipts[8], which is approximately at the level of Egypt's GDP for the same year, or 1.5 times higher than the GDP of Greece.

Table 4: International Tourist Arrivals (ITAs) and receipts from tourism per capita.

Country code	**ITAs per capita**	**Receipts from tourism per capita (in USD)**
AL	2.07	805.8
DZ	0.06	2.3
BA	0.36	363.5
HR	4.28	2,902.6
CY	3.34	2,753.3
EG	0.13	129.5
FR	1.35	944.3
GR	2.92	1,902.7
IL	0.51	839.4
IT	1.08	830.4
LB	0.28	1,254.4
LY	no data	no data
MT	5.55	3,769.4
MC	10.01	no data
ME	4.02	1,929.2
MA	0.35	224.8
SI	2.25	1,532.3
ES	1.77	1,690.9
SY	0.14	no data
TN	0.80	179.6
TR	0.61	357.2
MED	***0.79***	***593.3***

Colour codes

≥ 10 ITAs p.c		
5 – 10		
2 – 5		
0.5 – 2		
≤ 0.5		

(Sources: Based on UNWTO 2022 and 2022b; World Bank, 2022).

[8] Spending by international visitors on goods and services in destinations.

79. The main pressures of the tourism sector on the marine environment are marine litter, coastal land take, habitat degradation, air emissions, water consumption and sewage generation, and proximity to natural sensitive areas (UNEP/ MAP and Plan Bleu, 2020). Fluctuations in numbers of tourist arrivals come with a direct impact on the environment due to resource consumption and generation of externalities that are caused at the individual level, and that add on to more general impacts caused by tourism infrastructure.

80. In recent years, the number of tourist arrivals in Mediterranean countries was highly variable due to several reasons: Armed conflicts in the region, security concerns as well as political instability along with deteriorating social and economic conditions, all resulted in tourism downturns and/ or serious disruptions in some of the SEMC in the period since 2010, affecting in particular Syrian Arab Republic (with 8.1 million ITAs in 2010 and only 2.4 million in 2019), Libya, Egypt and Tunisia[9]. Egypt experienced a rapid tourism growth in the past – from 2.9 million arrivals in 1995 to a record of 14 million in 2010. However, following the 2011 instability and related events, ITAs plummeted and remained below 10 million for several years, to start rising again in 2018 and 2019.

81. The COVID-19 pandemic brought the total number of international arrivals down to 131.4 million in 2020 (-67.8% compared to 2019) i.e., well below the 1995 level (of 161 million). Receipts also plummeted from USD 308 billion in 2019 to USD 110 billion in 2020 (- 64.3%), while losses were spread unevenly across the region: Monaco and France recorded the lowest decreases in ITAs (-50% and -54% respectively), while Cyprus was the most affected (-85%), followed by Montenegro (-84%), Bosnia and Herzegovina (-83.3%) and Israel (-82.6%). Signs of recovery were visible already in 2021, with the total number of ITAs reaching 45.5% of the 2019 level, representing an increase of 41.3% compared to 2020, whereas receipts increased by an even larger margin (56.7%). Mediterranean tourism recovered faster than the global average and regional ITAs made up as much as 41.6% of the world tourism in 2021, compared to 27.8% in the pre-pandemic 2019. According to the WTTC data[10], the impact of COVID-19 crisis on employment was less severe than the impact on on tourism GDP: following a loss of 3.1 million jobs across the region in 2020 (a decline of 17.1% compared to 2019), total employment in 2021 was 16.8 million (representing a decline of 8.8% in relation to 2019). Full recovery of global tourism to pre-pandemic levels is projected for 2024 (EIU, 2022).

82. According to available estimates, almost half (47.2%) of all ITAs to Mediterranean countries in 2017 were linked to coastal areas (UNEP/MAP and Plan Bleu, 2020). Shares of coastal tourism varied markedly between different groups of countries, reaching for example 85% in the North East Mediterranean countries while remaining below 40% in North West and South East; the estimated share of coastal tourism in the South West Mediterranean was around 62%. In 2019, coastal areas accounted for a very high share of the total nights spent in tourist accommodation in Malta (100%), Cyprus (97%), Greece (96%), Spain (96%), and Croatia (93%) (EU, 2022). Nights spent in coastal regions of EU countries in 2018 represented 42% of the total; at the same time, coastal regions had the highest tourism intensity[11] with 12.3 nights-spent per inhabitant (Batista e Silva et al., 2020).

83. While tourism had a strong positive economic impact across the region and has emerged as a pillar of many national economies in the Mediterranean, the benefits associated with tourism came at significant environmental and social costs. The negative impacts of tourism have been widely recognised and documented[12], and there is a growing set of recommendations, policies and projects aiming at the development of sustainable tourism in the Mediterranean. When ITAs decreased in

[9] During 1990's, similar effects of conflicts and instability were seen in some Balkan countries that have recovered meanwhile and became major tourist destinations.
[10] Refer to direct and indirect GDP/ jobs.
[11] Compared to other types of tourism such as mountains and nature, cities, urban mix, and rural.
[12] In e.g., Plan Bleu, 2016; UNEP/ MAP and Plan Bleu, 2020; Plan Bleu, 2022; Fosse et al., 2021.

recent years, pressures on the environment caused by tourism decreased as well, giving coastal and marine biodiversity “a break” and the possibility to recover in some places, in conjunction with decreasing pressures from other human activities. For example, some marine species occurrences increased and water quality improved in many places during the COVID-19 pandemic (Coll, 2020). But the dominant Mediterranean mass tourism model has picked up speed again and continues to concentrate in coastal areas. Unless this model is profoundly changed into a sustainable model, the coastal and marine environment is likely to continue to be adversely affected by tourism in the years to come.

Note: For Morocco share of tourism in GDP 7,1% in 2019 (Source: Moroccan Ministry of Tourism)

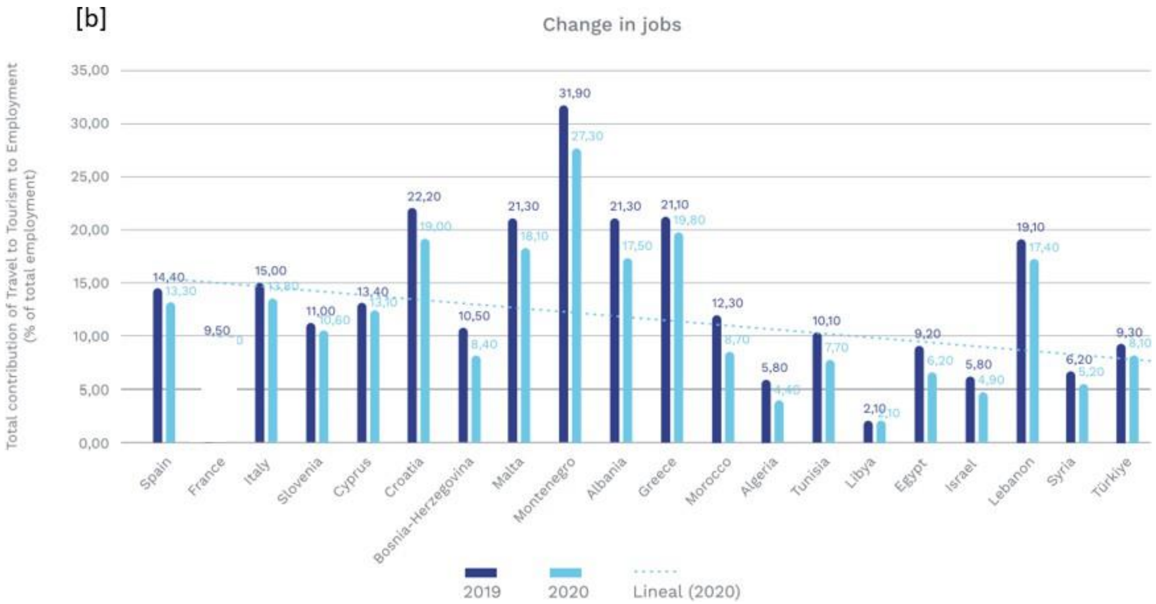

Figure 8: Change in tourism GDP(a) and jobs (b), 2019-2020.
(Source: Plan Bleu (2022). State of Play of Tourism in the Mediterranean, Interreg Med Sustainable Tourism Community project).

Fisheries and Aquaculture

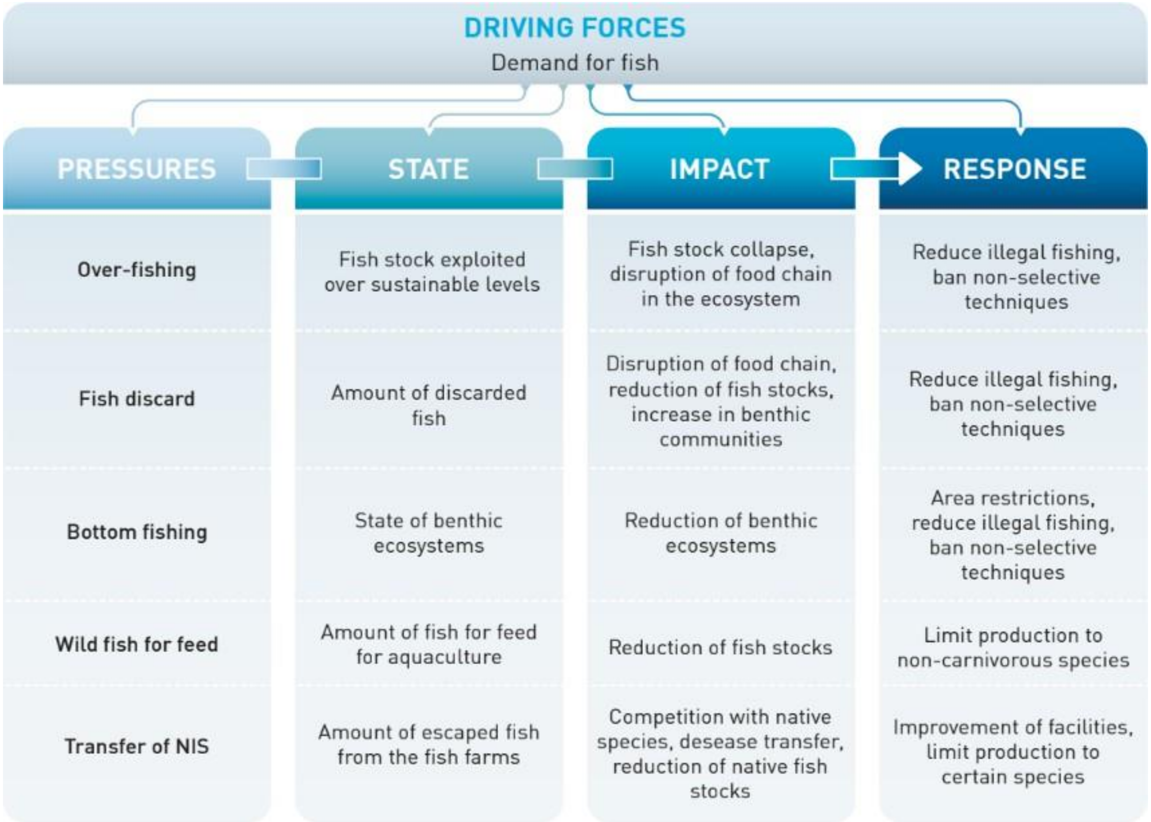

Figure *9*: Pressures exerted by fisheries and aquaculture.
(Source: UNEP/MAP and Plan Bleu, 2020)

84. A variety of capture fishery and aquaculture techniques are employed across the Mediterranean at different scales, including industrial, semi-industrial and small-scale fisheries, as well as industrial and small-scale farming. Capture fisheries exploit a variety of benthic and pelagic fish stocks, molluscs and crustaceans. Aquaculture production includes extensive aquaculture in pond or lagoon areas and small family farms cultivating mussels, but also more intensive offshore finfish cage farms. Fishery and aquaculture represent a relatively small sector of the Mediterranean blue economy (both in terms of GVA – less than 5%, and job creation – less than 10%)[13], nevertheless with an important socioeconomic and cultural function in terms of food production, revenue, employment and preservation of traditional activities (UNEP/MAP and Plan Bleu, 2020).

[13] Union for the Mediterranean (UfM) 2017 report *Blue economy in the Mediterranean,* https://ufmsecretariat.org/wp-content/uploads/2017/12/UfMS_Blue-Economy_Report.pdf based on earlier Plan Bleu analyses (e.g., 2014 report *Economic and social analysis of the uses of the coastal and marine waters in the Mediterranean*, https://planbleu.org/sites/default/files/publications/esa_ven_en.pdf).

Fisheries[14]

85. According to the latest available data (as reported to the GFCM Secretariat and/ or estimated), a total of 76,280 fishing vessels were operating by 2019 in 20 Mediterranean countries[15], with a total capacity of around 758,000 gross tonnage (GT)[16]. These figures are likely to be underestimating the actual size of the fleet, given the lack of data in some countries, especially regarding small-scale vessels (FAO, 2020).

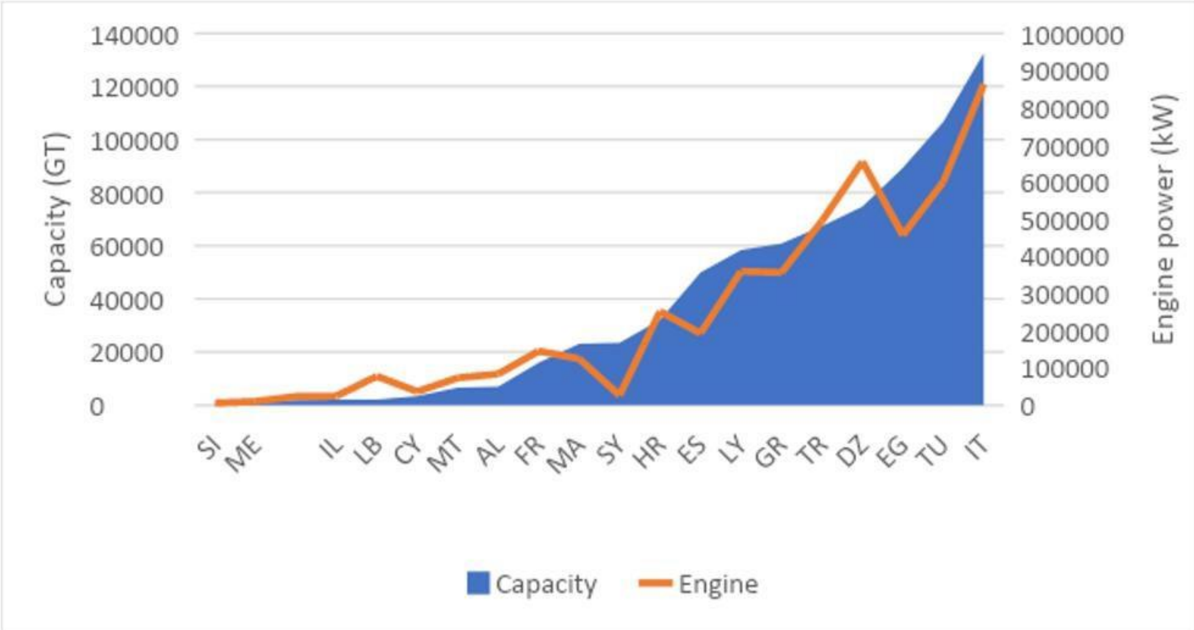

Figure 10: Capacity of the fishing fleet operating in the Mediterranean basin by country, 2019 (Source: FAO, 2020; own estimate)

86. In terms of capacity (expressed in gross tonnage (GT)), more than 62% of the fishing fleet is operated by five countries: Italy (17.5%), Tunisia (14.1%), Egypt (11.8%), Algeria (9.8%) and Türkiye (8.9%[17]). Greece's fishing fleet makes 16.8% of the total number of vessels, but only 8% of the total capacity, indicating that small-scale fisheries are prevalent. Besides Greece, small-scale fishing vessels account for 90% or more of the total fleet in Lebanon, Cyprus, Türkiye, Tunisia, Croatia and Morocco[18]. Four out of five fishing vessels in the Mediterranean are small-scale vessels[19]

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[14] For capture fisheries, information on fishing fleet, landings, revenues and jobs is predominately based on the report on the State of Mediterranean and Black Sea Fisheries (FAO, 2020).

[15] Data for Türkiye refers to the number of vessels operating in the Mediterranean, whereas capacity of these vessels was estimated based on an assumption it mirrors the share (39.3%) of the total number of vessels reported for the Mediterranean and Black Seas. Bosnia and Herzegovina and Monaco informed the GFCM Secretariat they had no operating fishing fleet in the last reporting period.

[16] The overall number of vessels reported and/ or estimated (by FAO, 2020) for the Mediterranean and the Black Sea was 87,641 (903,270 GT).

[17] Taking only into account 6,026 vessels that operate in the Mediterranean. Türkiye's total fishing fleet operating in the Mediterranean and Black Seas was reported to include 15,352 vessels (with capacity of 171,785 and engine power of 1,261,241 kW).

[18] For Morocco: According to the Moroccan Department of marine fisheries, reference year 2021.

[19] Including small-scale vessels 0–12 m with engines using passive gear; polyvalent vessels 6–12 m; and small-scale vessels 0–12 m without engines using passive gear. Polyvalent vessels are all vessels using more than one gear type, with a combination of passive and active types of gear, none of which are used for more than 50 percent of the time at sea during the year.

which are the predominant fleet segment in all Mediterranean fishing sub-regions, in particular in the Eastern and Central Mediterranean. Another important fleet segment are trawlers and beam trawlers, accounting for 7.9% of the total, predominantly used in the Western Mediterranean and the Adriatic; purse seiners and pelagic trawlers make up 5.5% of the fleet.
87.
Table 5: Mediterranean fishing fleet by country and segment

		Share (%) of operating vessels by fleet segment				
Country code	**No of vessels**	**Small-scale**	**Trawlers, beam trawlers**	**Purse sein., pelagic trawl.**	**Other segments[20]**	**Unallocated**
AL	445	67.0	27.0	5.2	0.9	0.0
DZ	5,608	61.8	9.9	28.4	0.0	0.0
HR	6,211	91.2	5.5	2.7	0.5	0.0
CY	774	94.4	1.0	0.0	4.5	0.0
EG	3,945	44.6	24.0	5.3	26.1	0.0
FR	1,418*	88.9	6.0	1.1	3.9	0.0
GR	12,807	95.4	1.8	1.7	1.2	0.0
IL	336	79.8	5.7	3.0	11.6	0.0
IT	10,909	69.7	18.6	4.1	7.6	0.0
LB	2,084	95.0	0.0	4.4	0.7	0.0
LY	3,974	73.3	2.0	3.1	17.8	3.7
MT	682	77.6	2.9	0.6	18.9	0.0
ME	224	85.3	5.8	8.9	0.0	0.0
MA	3,496*	87.0*	4.3	7.0	1.7	0.0
SI	72	87.5	12.5	0.0	0.0	0.0
ES	2,056	51.2	28.0	10.7	10.1	0.0
SY	1,300	0.0	0.0	0.0	0.0	100.0
TU	13,300	92.7	3.6	3.4	0.3	0.0
TR	6,026	93.9	3.8	1.0	1.4	0.0
Med total	**76,280**	**80.5**	**7.7**	**5.4**	**4.5**	**1.9**

* For France: 1,340 in 2020 according to national French sources DGAMPA, SSP, Ifremer-SIH, 2020.
For Morocco: 3,543 vessels on the Mediterranean façade in 2021, of which 92% artisanal according to the Moroccan Department of marine fishing. (Source: FAO, 2020).

88. Contribution of the Mediterranean and Black Sea fisheries to the global marine capture ranged from 2.55% during the 1980s to 1.55% in 2020 (FAO, 2022), taking into account that the Mediterranean Sea represents less than 1% of the world's ocean surface. After an irregular decline in total landings in the Mediterranean that started in the mid-1990s and led to the lowest volumes in 2015 (760,000 tonnes), production increased again over the following three years to 805,700 tonnes in 2018. The average landings over the 2016-2018 period were 787,830 tonnes (a 3% increase compared to the average for the period 2014-2016).

[20] Includes polyvalent vessels 12–24 m, longliners 12–24 m, dredgers 12–24 m, and longliners > 6 m.

89. From 2016 to 2018, Italy continued to be the main producer (22.7% of the total Mediterranean landings), followed by Algeria (13.1%), Tunisia (12.2%), Spain (10%), Greece (9.3%), Croatia (8.9%), Egypt (6.9%), and Türkiye[21](6.4%). The remaining 12 countries[22] accounted for less than 4% individually; added together, their landings represented 10.6% of the Mediterranean total. Compared to the previous period (2014-2016), total landings increased the most in Türkiye (by 20.4%), while as the most substantial decrease (-10.6%) among major producers was recorded in Morocco; in Slovenia and Israel average landings decreased by 30.5% and 22.2% respectively.

Figure 11: Distribution of landings per country, average 2016-2018.
(Source: FAO, 2020).

90. In the period 2016-2018, the main species and their contributions to the total catch were as follows: sardine (23%); European anchovy (14.1%); Sardinellas nei (5.8%); marine fishes nei (4.6%); jack and horse mackerels nei (2.8%); deep-water rose shrimp (2.8%); bogue (2.6%); and European hake (2.5%); other species' individual contributions were below 2%.

91. During the five years 2013-2018, total revenues in the GFCM area (including Black Sea) were between 3.2 and 3.6 billion (in constant 2018 USD). Total revenue/ value at first sale[23] from marine capture fisheries in the Mediterranean is estimated at USD 3.4 billion in 2018. When different fleet segments are considered, the highest revenues are generated by trawlers, followed by small-scale vessels and purse seiners/ pelagic trawlers. As regards the fishing sub-regions, predominant shares of total revenues are generated in the Western and Eastern Mediterranean (FAO, 2020).

[21] Average landings 2016-2018 for the Mediterranean Sea equalled 50,772 tonnes; average total landings (including Black Sea) were 273,977.
[22] Total landings by Bosnia and Herzegovina and Monaco are negligible.
[23] Revenue is estimated as the value at first sale of fish from vessel-based marine capture, prior to any processing or value-addition activities.

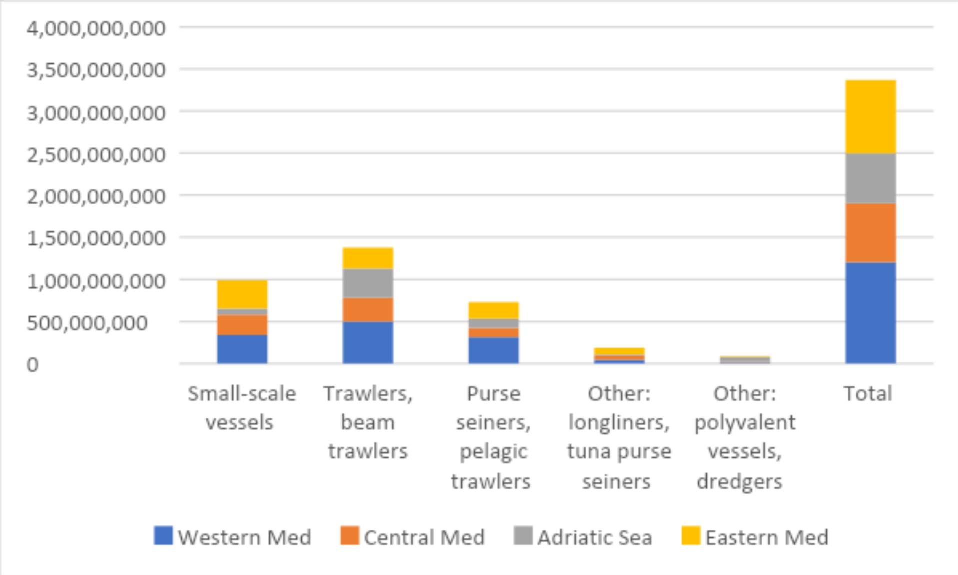

Figure 12: Revenue by fleet segment and sub-region (constant 2018 USD).
(Source: FAO, 2020).

92. The wider economic impact of fisheries along the value chain in the region, including direct and indirect and induced effects, is estimated to be 2.6 times the value at first sale (FAO, 2018). In the Mediterranean, revenue from small-scale fisheries makes 29% of the total; however, in some countries (e.g., Cyprus, France, Greece, Lebanon, Morocco, Slovenia), small-scale fisheries account for as much as 50% of the total revenue (FAO, 2020).

93. According to FAO (2020), total employment onboard fishing vessels in the Mediterranean was near 202,000 in 2018. Approximately one third of these jobs are linked to fishing in the Western and Eastern Mediterranean sub-regions; the Central Mediterranean accounts for 24% of the total number of jobs, and the Adriatic Sea sub-region for 9%. Estimates from the previous analyses (for example by the World Bank, FAO and WorldFish) suggest that non-vessel-based jobs employ almost 2.5 times as many people as those onboard vessels. On average, employment onboard fishing vessels represents around 0.1% of total coastal populations (i.e., approximately one fisherman per 1,000 coastal residents), but is six to 11 times higher in Morocco, Croatia and Tunisia. Small-scale fisheries account for 55% of the total employment onboard fishing vessels (but the share can go to as much as 70 – 90% in some countries). Women represent between 1 and 6% of the capture fisheries workforce. In processing, women either represent the majority of workers or are in the same numbers as men. Women are considered to play a vital role in the sale of fish, pesca-tourism and gastronomic activities. Where available, disaggregated data showed women were predominantly found in lower-level jobs with less pay than men (EC, 2019).

94. The Mediterranean fisheries were severely affected by the COVID-19 pandemic (GFCM, 2020; FAO, 2020). A reduction in operating vessels of up to 80% was observed in some countries, with a decrease in production of some 75% during the first months following the outbreak. This may have led (at least temporarily) to reduced pressure on resources and the environment. Total marine captures in the Mediterranean and Black Sea decreased by 14.4% in 2020 compared to 2019, i.e., by 9.2% compared to the average annual production during the 2010s (FAO, 2022) but longer-term COVID-19 impacts on fisheries are yet to be analysed.

95. Overall, fisheries in the Mediterranean remain highly threatened by overfishing, pollution, habitat degradation, invasive species and climate change (UNEP/MAP and Plan Bleu, 2020). Among FAO's 16 Major Fishing Areas in 2019, the Mediterranean and Black Sea had the second highest rate of stocks fished at unsustainable levels (63.4%), behind the Southeast Pacific with 66.7% (FAO, 2022).

96. Most stocks remain in overexploitation; however, the number of stocks in overexploitation has further decreased, as has the overall exploitation for the whole Mediterranean and Black Sea region. For the stocks for which validated assessments are available, a notable decrease of stocks in overexploitation has been assessed in recent years: from 88% in 2014, to 75% in 2018. This dynamic is reflected in marked improvements for a number of demersal species in terms of fishing mortality and, in some cases, biomass, too (FAO, 2020).

97. Nevertheless, the GFCM estimates the overall fishing mortality for all resources combined is nearly 2.5 times higher than sustainable reference points. A clear (although not significant) decreasing trend has been seen in the average exploitation ratio (current fishing mortality over target fishing mortality, F/FMSY) since 2012. Based on available information (for 62 stocks covering 20 geographical subareas and 14 species), 36% of Mediterranean stocks are assessed to have low biomass levels, 19% intermediate and less than a half (46%) high biomass level (FAO, 2020).

98. In addition to its negative environmental impact, bycatch from fishing activities – including discards and incidental catch of vulnerable species – has significant implications for the sector, including from economic, regulatory and public perception perspectives. Sea turtles (around 89%) and elasmobranchs (around 8%) continue to represent the highest share of reported incidental catch of vulnerable species; seabirds and marine mammals together account for the remaining 3% (FAO, 2020). Discards represent a window for improvement in the fishing sector as 18% of total catches are discarded (UNEP/MAP and Plan Bleu, 2020, based on the FAO's The State of Mediterranean and Black Sea Fisheries 2018).

99. While playing a particularly important cultural and employment role, small-scale fisheries are generally considered to have less ecological impact than industrial fisheries but can still have significant impacts that need to be addressed (Bolognini et al., 2019).

Aquaculture[24]

100. Total marine aquaculture production (excluding freshwater, including Türkiye's Black Sea production) approached one million (994,623) tonnes in 2020 with average annual growth rates of 6.8% and a cumulative increase of around 90% between 2010 and 2020. The most extensive growth was recorded in Algeria, where production increased by a factor of 15 to 30. In the same period, production increased by several folds in Tunisia, Albania, Türkiye, Egypt and Malta. A decrease was recorded in France and Italy, as well as in Bosnia and Herzegovina and Lebanon. Marine aquaculture output was not negatively affected by the COVID-19 pandemic: production in 2020 increased by 13.2% compared to 2019.

101. The biggest aquaculture producers are Egypt, Türkiye, Greece and Italy. Taking into account the average annual production (2010-2020), Egypt and Türkiye accounted for 27.2 and 23.4% of the total respectively; due to high growth rates in these two countries, their relative shares in the overall production increased by 2020 approaching and/or slightly exceeding one third of the total (35.4% for Egypt and 29.5 for Türkiye). Egypt is a globally significant producer, where total aquaculture output (including freshwater) grew from less than half a million tonnes in the early 2000s, to 1.6 million

[24] Information on production (quantity, value) 2010-2020 from the FAO FishStatJ database (FAO, 2022a). Data for Libya and Syrian Arab Republic were not available for the observed period; no production reported for Monaco. Data for Türkiye include Black Sea aquaculture. Sources other than FishStatJ database were used, as referenced in the text. Although freshwater aquaculture may impact the marine environment via discharges to Sea, freshwater aquaculture has not been considered in this analysis.

tonnes in 2019, making more than 80% of the total fish production (capture fisheries and aquaculture) in the country (FAO, 2022).

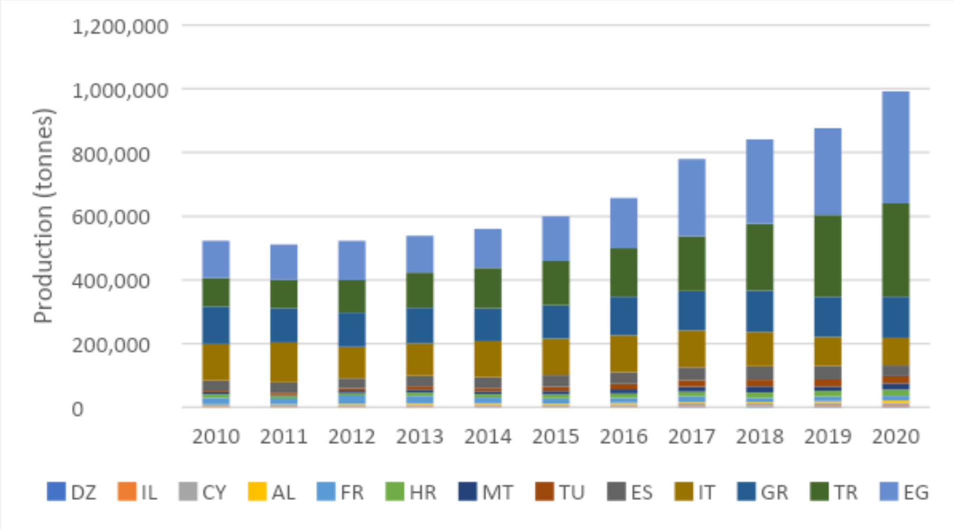

Figure 13: Aquaculture output 2010-2020: contribution of the main producers.
Note: countries with production of more than a thousand tonnes in recent years (Cumulatively accounting for more than 99% of the total) shown in the graph. (Source: FAO, 2022a, FishStatJ database accessed November 2022).

102. In 2019, production of less than one thousand tonnes was recorded in Slovenia (914), Morocco (465), Montenegro (379), Bosnia and Herzegovina (176) and Lebanon (19).

103. Among the top five producers, stable output trends were recorded in Greece and Spain, while in Italy production dropped by a quarter in 2020 compared to 2010 (mainly due to reduced shellfish production). High growth rates characterise production in Türkiye and Egypt, especially as of 2016.

104. Value of production increased from USD 2.3 billion in 2010 to USD 4.3 billion in 2020. In 2018, aquaculture production value (USD 3.5 billion) slightly exceeded total revenue from capture fisheries (USD 3.4 billion)[25]. Highest production values in 2020 were recorded in Türkiye, Egypt, Greece, Italy, Spain and Malta (accounting for some 88% of the total).

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[25] It should be noted that aquaculture production value includes Türkiye's Black Sea production (while capture fisheries revenue refers only to the Mediterranean fishing area).

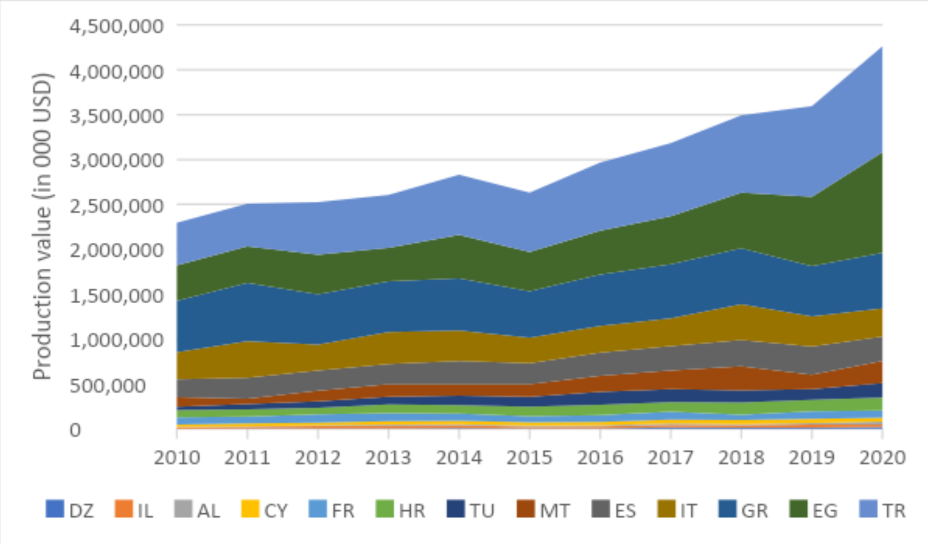

Figure 14: Aquaculture production value, main producers 2010-2020.
(Source: FAO, 2022a, FishStatJ database accessed November 2022).

105. Mediterranean marine aquaculture is dominated by finfish, accounting for 83% of the total production; molluscs account for 16% of the overall output. Gilthead seabream (*Sparus aurata*) and Seabass (*Dicentrarchus labrax*) are the most commonly farmed species, at 464,000 tonnes and USD 2.24 billion in 2019. More than 95% of the world's seabream and seabass production comes from aquaculture, of which 97% is produced by Mediterranean countries. In terms of quantity, other important farmed species are mullets and mussels. With a production of 99,200 tonnes in 2019, Mediterranean mussel (*Mytilus galloprovincialis*) is the fourth most farmed species in the region, with Italy (62% of the region's production) and Greece (24%) as the main producers (Carvalho and Guillen, 2021). Bluefin tuna are also raised in some locations.

106. Data on aquaculture jobs are less available than for capture fisheries. One of the recent estimates suggest that Mediterranean aquaculture offers employment to 313,000 persons, taking into account both direct and indirect jobs (Bolognini et al., 2019). Like fisheries, aquaculture is also a sub-sector dominated by male workers in the EU Member States, with women representing 7% to 26% of the workforce, but with more opportunities being provided for women (EC, 2019). In this sub-sector, there is also an unreported number of "invisible" female workers, particularly in small-scale freshwater aquaculture and shellfish farming.

107. Aquaculture made around half the total fishery output in the Mediterranean in recent years, and is expected to continue growing, in line with global trends. Its environmental effects depend on the size of the farms, the production systems and management methods used, as well as on the marine habitats in which they are located; aquaculture may harm the marine environment, and at the same time depends on a good quality environment to be productive (Bolognini et al., 2019).

108. Growth in aquaculture production in the Mediterranean can be accompanied with high dependency on fish meal from sea catches, large nitrate and phosphorus effluents, as well as genetic modification of natural fish stocks (UNEP/ MAP and Plan Bleu, 2020). Some of the priority issues related to sustainable aquaculture development in the Mediterranean (as identified by Massa et al., 2017) include integration of aquaculture into coastal zone management and sea use planning, improvements in site selection and licensing procedures, enhancement of aquaculture-environment interactions and implementation of environmental monitoring.

<u>Maritime transport</u>

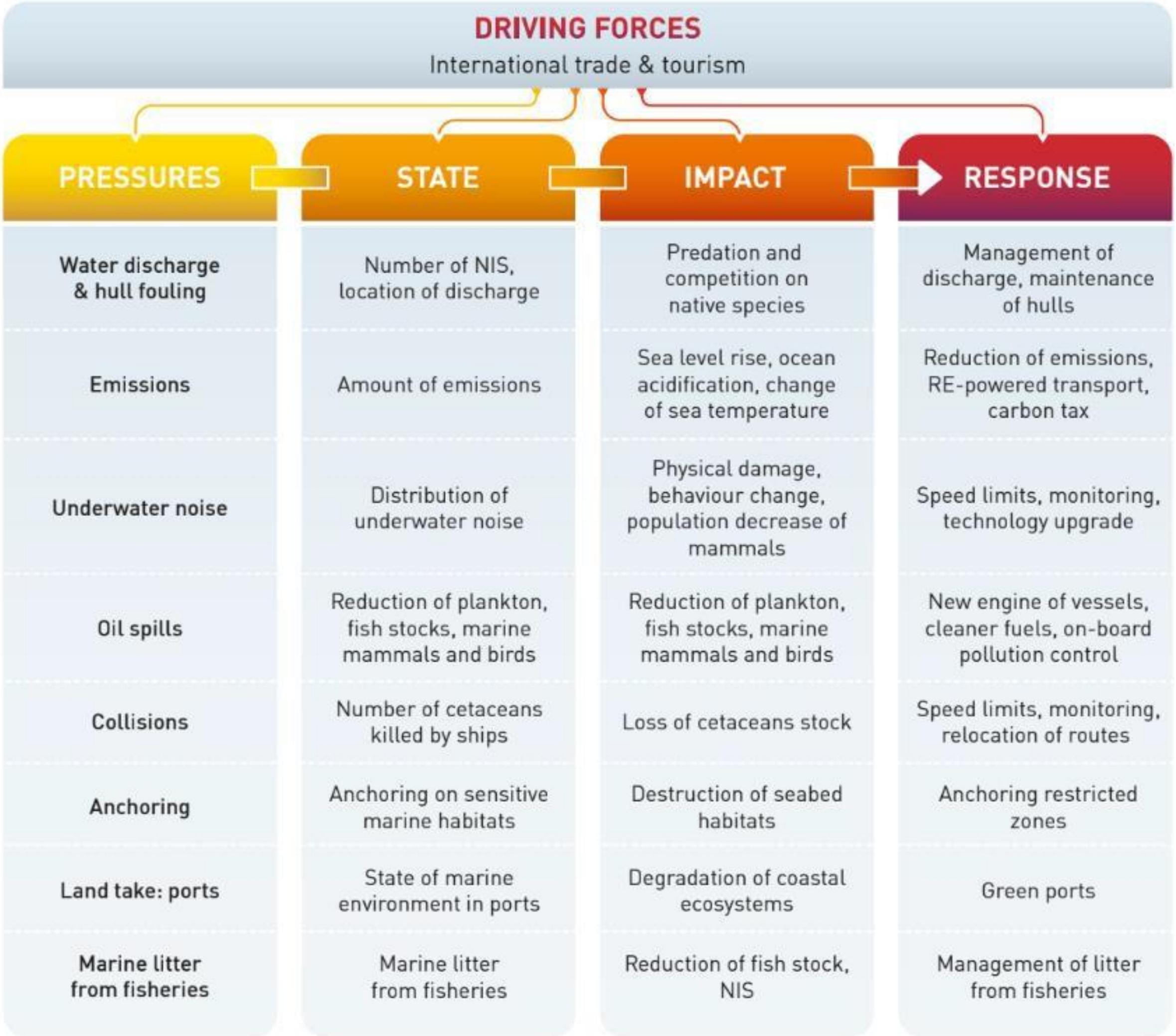

Figure 15: Pressures exerted by maritime transport on the marine environment.
(Source: UNEP/MAP and Plan Bleu, 2020).

109. The Mediterranean Sea is located at the crossroads of three major maritime crossings: Strait of Gibraltar, opening into the Atlantic Ocean and the Americas; the Suez Canal, a major shipping gateway which connects to Southeast Asia via the Red Sea; and the Dardanelles Strait, leading to the Black Sea and Eastern Europe/Central Asia. With such a strategic location, it is an important transit and trans-shipment area for international shipping, as well as a realm for Mediterranean seaborne traffic (movement between a Mediterranean port and a port outside the Mediterranean) and short sea shipping activities between Mediterranean ports (UNEP/MAP and Plan Bleu, 2020).

110. Despite covering less than 1% of the world's oceans, the Mediterranean Sea accounted for more than a fifth (21-22%) of global shipping activity measured by the annual number of port calls, and around 9% of the annual container port throughput in recent years (Randone et.al, 2019; own calculations based on UNCTAD, 2022a). Approximately 18% of global seaborne crude oil shipments take place within or through the Mediterranean. In some countries (Croatia, Cyprus, Greece, Italy, Malta, Spain), maritime transport (including port activities and shipbuilding and repair) accounted for between 0.4 and 1.3% of the total employment in 2019. The Western Mediterranean and the Aegean-Levantine Sea are the busiest parts of the basin (Randone et al., 2019).

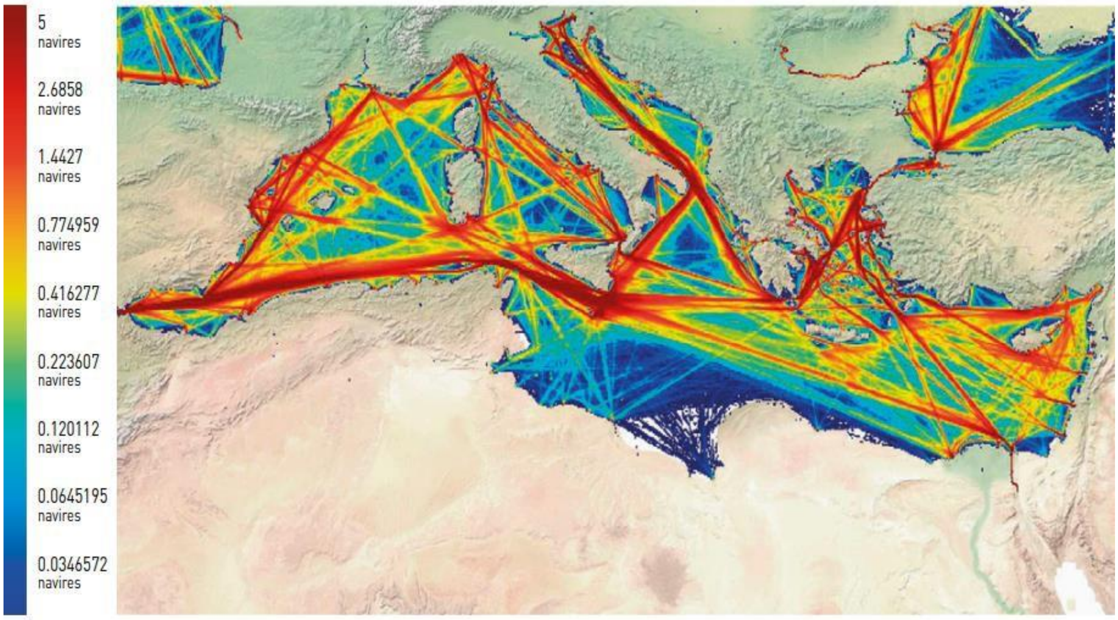

Figure 16: Traffic density in the Mediterranean Sea area.
(Source: INERIS, 2019).

111. Over the period 2015 – 2021, the merchant fleet registered in 20 Mediterranean countries[26] encompassed a total of around 9,400 vessels, with a capacity of more than 245 million dead-weight tons in 2021. Total carrying capacity increased by 63.5% (from 152.9 million) in comparison with 2005. Four countries (Malta with 46.5%, Greece with 25.9%, Cyprus with 13.7% and Italy with 4.5%) account for 90% of the total merchant fleet carrying capacity (UNCTAD, 2022a).

112. As regards ownership of the world fleet (by carrying capacity expressed in dead-weight tons) in 2021, five Mediterranean countries were among top 35 world economies: Greece (4,705 vessels in total, 620 under national flag) with 17.6% of the world total; Monaco (478 vessels, none under national flag), accounting for 2.1% of the total; Türkiye (1,548 vessels, 426 under national flag), 1.3%; Italy (651 vessels, 481 under national flag), 0.8%; and Cyprus (311 vessels, 134 under national flag), with 0.6% of the carrying capacity of the world's fleet (UNCTAD, 2021).

113. The Mediterranean has more than 600 commercial ports and terminals (Plan Bleu, 2014). Nine of these are among the 20 largest cargo ports in the European Union: Algeciras and Valencia (Spain), Marseille (France), Genova and Trieste (Italy), Piraeus (Greece), and Aliaga, Izmir and Ceyhan and İskenderun ports (Türkiye). Important ports in the southern Mediterranean with more than 1 million TEU include Port Said and Alexandria (Egypt), Tangier (Morocco), Beirut (Lebanon) and Haifa (Israel) (Randone et al., 2019, and Grifoll et al., 2018).

114. With nearly one million (935,649) port calls in 2021, volume of maritime transport reached 96% of 2019 level in the Mediterranean countries. Italy's ports accounted for one quarter of the total port calls in 2021, Türkiye's for one fifth, followed by Greece (16.4%), Spain (12.7%), Croatia (7.8%), France (6.8%) and Malta (3.2%). Share of passenger ships in total port calls in 2019 exceeded 75% in Croatia, Malta, Italy, Greece and Türkiye; cargo ship calls were predominant (accounting for 75% of the total or more) in Tunisia, Cyprus, Algeria, Slovenia and Israel. COVID-19 impact (measured by the number of port calls) was the lowest in Albania (-3% in 2020 compared to 2019), the highest in Montenegro (reduction of nearly 52%); in the countries with largest annual numbers of port calls, reduction was around 15% (UNCTAD, 2022a).

[26] No data for Bosnia and Herzegovina.

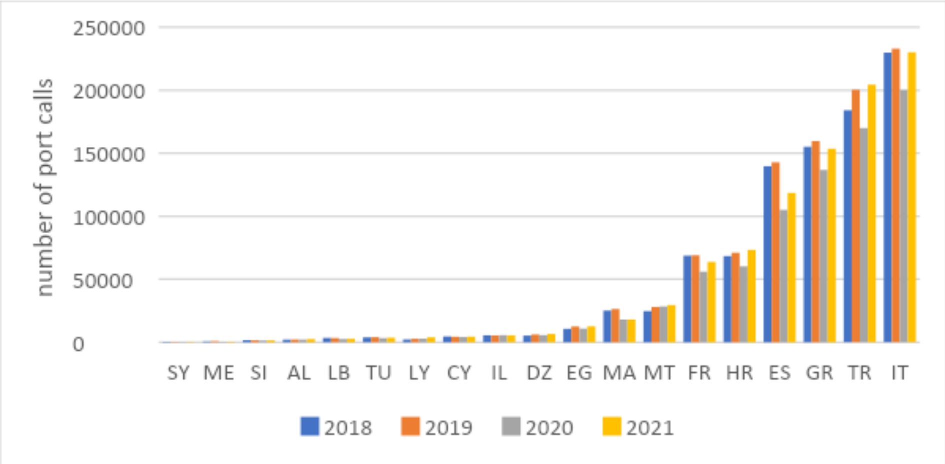

Figure 17: Number of port calls by country, 2018-2021.
(Source: UNCTAD 2022a)

115. Shipbuilding activities are present in several Mediterranean countries (Egypt, Greece, Spain, Croatia, Türkiye, France and Italy), and represent a very small share of the global shipbuilding: with a share of 0.6 to 0.9% since 2016, Italy was the lead Mediterranean country. Türkiye is a provider for ship recycling, with 9.2% (or 1.6 million gross tons) of the total reported tonnage sold for ship recycling in 2020 (UNCTAD, 2021).

116. The impact of the COVID-19 pandemic on international maritime trade was not as dramatic as initially expected[27]. Growth had already been weak in 2019 at 0.5%, and in 2020 total maritime trade declined by 3.8%. In 2021, a 3.2% growth was recorded bringing global maritime trade to only slightly below the pre-pandemic level. In line with the global expansion of seaborne trade, shipping in the Mediterranean basin is expected to increase in the coming years, in terms of both number of routes and traffic intensity.

117. The main pressures from maritime transport on the environment include: potential accidental and illicit discharges of oil and hazardous and noxious substances (HNS); marine litter; water discharge and hull fouling; air emissions from ships; underwater noise; collisions with marine mammals; land take through port infrastructure; and anchoring (UNEP/ MAP and Plan Bleu, 2020).

[27] A study (IEMed, 2021) looking at the COVID-19 impacts in, *inter alia* the Western Mediterranean, found out that the number of vessels sharply decreased in the first days of mobility restrictions (starting from March 2020) compared to pre-disturbance baselines (i.e., equivalent periods of 2019), reaching an overall median drop of 51% during the initial national lockdowns (lasting approximately until 22 June 2020). Maximal reductions ranged from 22.2% (tankers) to 93.7% (recreational boats), with a maximal overall drop across all categories of 62.2% during mid-April.

Energy (Oil and Gas and Renewable energy - offshore)

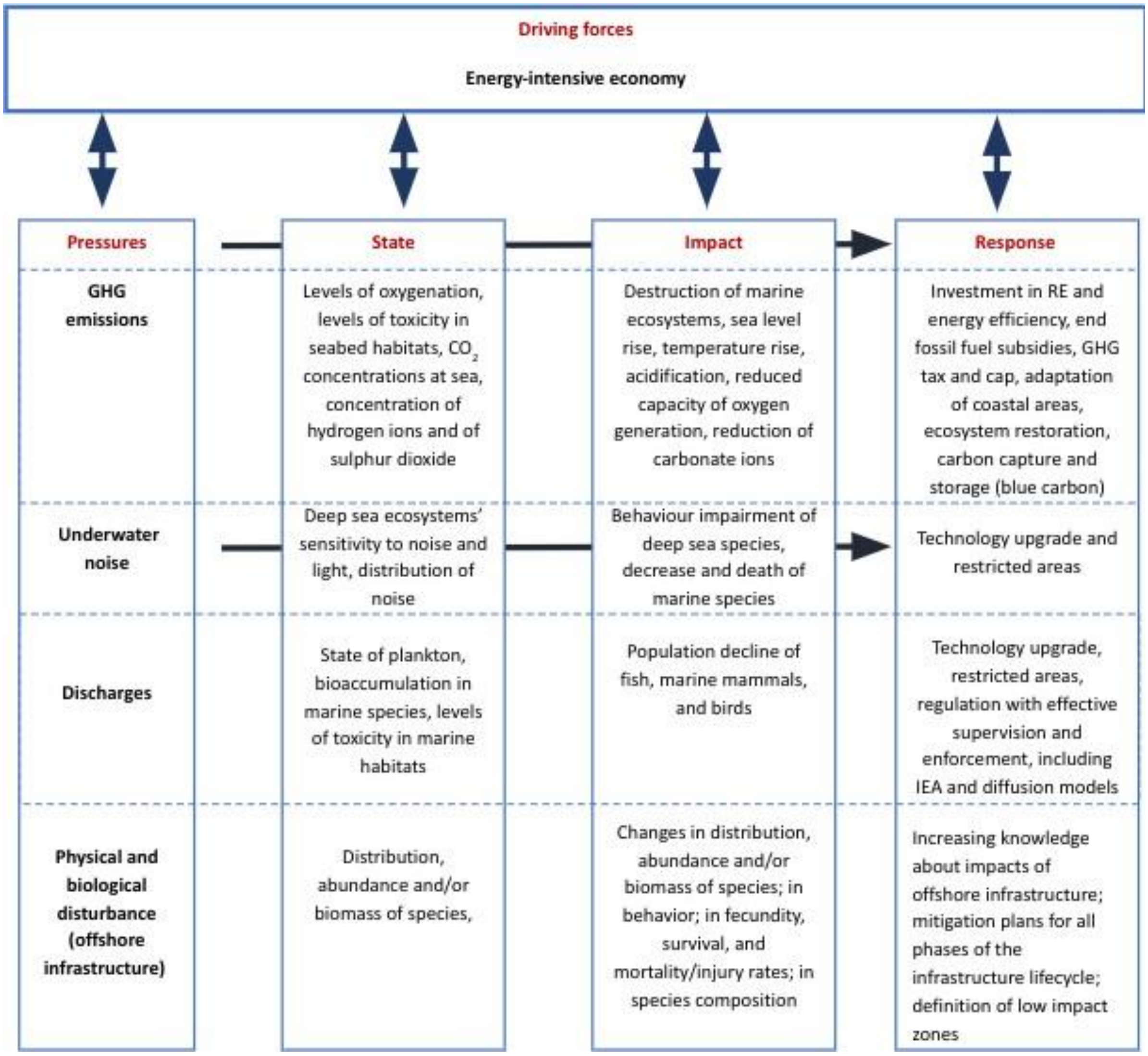

Figure 18: Pressures exerted by energy production and consumption in the Mediterranean. (Source: Based on UNEP/MAP and Plan Bleu, 2020).

118. The Mediterranean region is a net importer of energy: in 2018, total consumption exceeded total production by 39%. If the current trends continue, import dependence is projected to grow over the next decades (OME, 2021).

Primary energy demand:

119. Total primary energy demand (Table 6) in the Mediterranean equalled 1,021 Mtoe[28] in 2018 and 1,030 Mtoe in 2019, with an overall increase of around 45% compared to 1990. In 2020, a decrease of around 9% was recorded due to the effects of the COVID-19 pandemic, bringing primary energy demand down to 938 Mtoe.

Table 6: Primary energy demand in the Mediterranean

	1990		**2018**		**2020**	
	Mtoe	Share (%)	Mtoe	Share (%)	Mtoe	Share (%)
Coal	106	14.9	105	10.3	95	10.1
Oil	350	49.1	369	36.1	322	34.3
Gas	108	15.2	303	29.7	284	30.3
Nuclear	97	13.6	124	12.1	99	10.6
Hydro	16	2.3	24	2.4	24	2.6
Renewables	35.5	4.9	96.1	9.4	113.6	12.1
TOTAL	**712.5**		**1021.1**		**937.6**	

(Source: OME (2021), Mediterranean Energy Perspectives to 2050, edition 2021).

120. Shares of coal and oil in the total primary energy demand had a downward trend over the past three decades, with a particularly pronounced decrease for oil (accounting for about half the energy demand in 1990, going down to around one third in 2020); shares of nuclear sources and hydro energy were relatively stable (Table 6). Major changes in the primary energy mix were seen for gas (doubling of the share in 2020 compared to 1990) and renewables (increase of 2.4 times between 1990 and 2020). Demand for renewables proved resilient to the effects of COVID-19 crisis, with a recorded increase of around 18% in 2020 (compared to 2018).

121. There are marked differences in the primary energy consumption across the Mediterranean, with the South Mediterranean countries currently accounting for 40% of the region's total, while per capita energy demand in the South is less than half that in the North. Disparities are also pronounced as regards energy transition. Despite recent investments, some eastern and southern rim countries lag behind the Northern Mediterranean in energy mix diversification, energy efficiency improvements and in increasing the share of renewable energies (MedECC, 2020).

Renewables.

122. The most significant uptake of renewables has been recorded in power generation, while the share of renewable sources is still very low in end-use sectors, especially in industry and transport. In 2020, renewable energy technologies made up 43% (686 GW) of the total power generation capacity, deployed predominantly in the North Mediterranean countries. Nevertheless, the development of renewable capacity was very fast in the South and East where it nearly tripled over the period 2005 – 2020 (OME, 2021).

123. Biomass and waste had a dominant share (59.3%) in the structure of renewables in 2020, followed by geothermal (14.6%), wind (14.4%) and solar (11.5%); the share of tide, wave and ocean energy was below 1%. Photovoltaics were the main contributor to solar energy demand in 2020, accounting for 58.6% of the total, followed by solar heating and cooling (25%) and concentrated solar power (16.3%). The fastest growing renewables are wind and solar: demand for wind energy reached

[28] Million tons of oil equivalent.

16.36 Mtoe in 2020 while it was non-existent in 1990; demand for solar energy increased from 0.54 Mtoe in 1990 to 13.11 Mtoe in 2020 (data from OME, 2021).

124. Offshore wind installations, as well as wave, tide-current and thermal gradient energies are in the early stages of development in the Mediterranean. The offshore wind sector is expected to grow in the coming decades, inter alia due to new developments in floating platform constructions making them more suitable to deep waters. In the EU Mediterranean countries, production of electricity by offshore wind farms could reach 12 gigawatts (GW) in 2030 (UNEP/MAP and Plan Bleu, 2020).

125. While supporting energy decarbonization, the expansion of marine energy production may lead to significant environmental impacts, many of which are not yet sufficiently studied: adverse impacts on bird behaviour, abundance and survival, especially if offshore wind farms are located on major migratory routes; impacts on behaviour and abundance of marine mammals including through noise; increased marine traffic to service the infrastructure; impacts on ecosystem structure, functions and processes; but also including potential positive impacts on biodiversity through the artificial reef effect of marine infrastructure. While knowledge gaps persist, marine renewables may hinder the achievement of good environmental status for biodiversity or seafloor integrity (Galparsoro et al., 2022).

Fossil fuels

126. Although shares of fossil fuels in the total primary energy are slowly declining, demand for oil and gas continued to rise in absolute numbers and the reliance on these energy sources is still very high across the Mediterranean. Coal, oil, and gas accounted for three quarters of the region's primary energy demand in 2020.

127. The Mediterranean oil and gas resources (onshore and offshore) are assessed at close to 7% of oil and over 9% of the world's conventional gas resources (OME, 2021).

128. More than two hundred offshore oil and gas platforms were active in the Mediterranean in the second half of 2010s (UNEP/MAP and Plan Bleu, 2020). With recent explorations (in the Levantine Basin,, as well as in the Nile Delta Basin and the Aegean Basin) and new discoveries of large fossil fuel (mainly gas) reserves[29], the number is expected to increase, with potential transformative effects for ecosystems and economies, in particular in the Eastern Mediterranean. In recent years, resurgence of interest in exploration has also been recorded in the Adriatic, in the areas south-west and west of Crete, and in the Ionian Sea (OME, 2021).

129. Between 1990 and 2018, total production of fossil fuels in the Mediterranean increased by 8.3% (from 349 to 378 Mtoe), whereas oil and coal production shrank and gas production more than doubled.

130. Alternative gases were not used to a significant extent in the past. But the development and use of gases such as biomethane from organic sources, bio-LNG and synthetic natural gas, or by blending hydrogen[30] into existing natural gas networks (OME, 2021). Alternative fuels must be carefully produced and managed to avoid serious unintended consequences of their use, including greenhouse gas emissions.

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[29] According to OME, 2021, one of the most important recent (2015) natural gas discoveries was the super-giant Zohr field offshore Egypt with 850 bcm of gas in place, confirming the substantial hydrocarbons potential in the Mediterranean Sea and the region's significance in the global fossil fuels exploration and production industry.
[30] Green hydrogen produced from water using renewable electricity or blue hydrogen produced from natural gas supported with Carbon Capture, Utilisation and Storage (CCUS).

131. When it comes to offshore oil and gas activities, environmental impacts may arise at all phases: exploration, exploitation and decommissioning. These impacts include oil discharges from routine operations, use and discharge of chemicals, atmospheric emissions, noise, light and physical impacts from the placement of pipelines and installations. During the transportation of oil and gas by pipeline or tanker, accidental spills from installations have the potential to cause impacts beyond the area of production. A high dependence of the Mediterranean region on fossil fuels is correlated to environmental risk stemming from the exploration, exploitation, decommissioning and transport of these fossil fuels (UNEP/MAP and Plan Bleu, 2020).

Marine mining

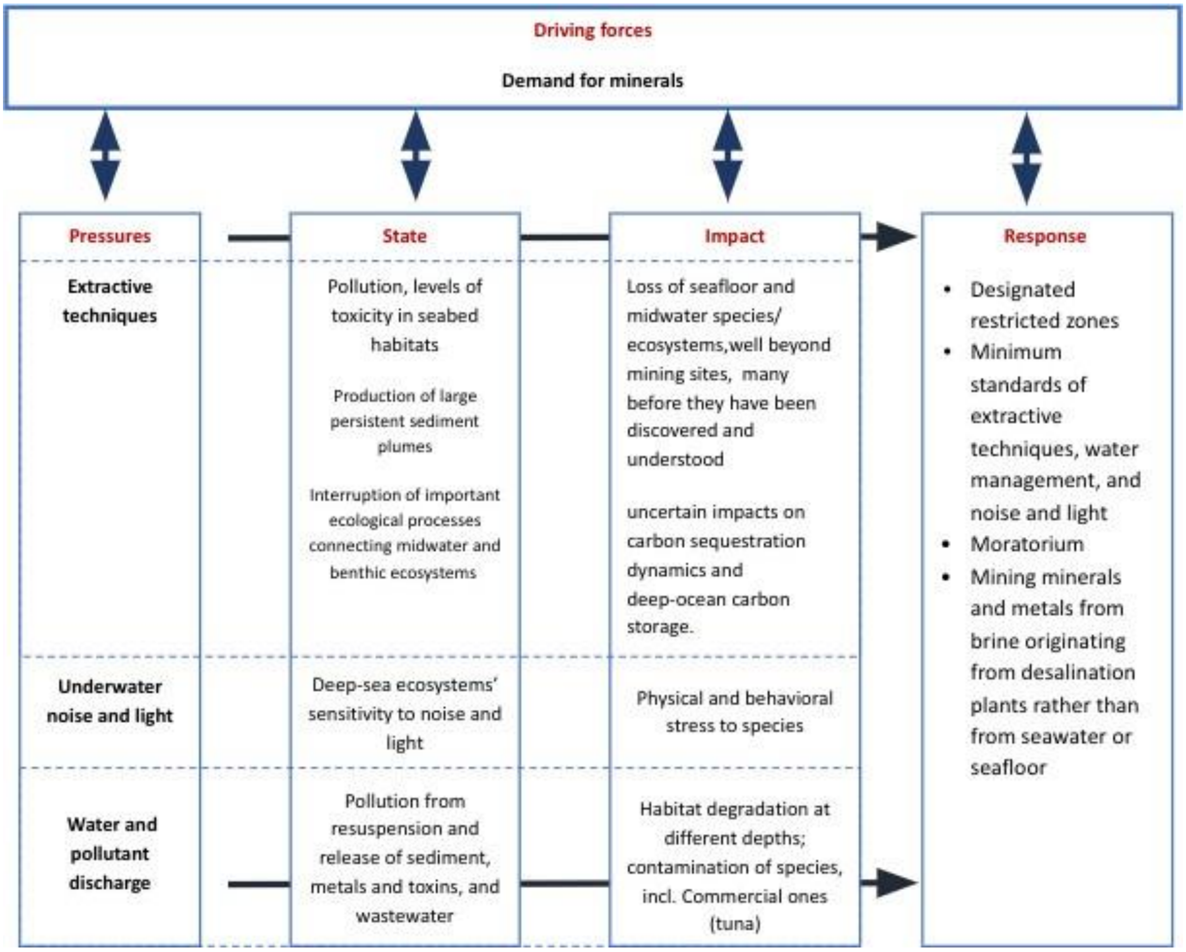

Figure *19*: Driving forces (demand for minerals) in the Mediterranean.
(Source: Based on UNEP/MAP and Plan Bleu, 2020 and Seabed mining science statement website[31]).

[31] http://www.seabedminingsciencestatement.org, 2023.

132. Marine and seabed mining is defined by OECD as the production, extraction and processing of non-living resources in seabed or sweater (OECD, 2016). For example, this includes extraction of minerals and metals from the seabed (in shallow waters or the deep sea), marine aggregates (limestone, sand and gravel) and minerals dissolved in seawater. Analyses conducted in the framework of the European Maritime Spatial Planning Platform (Pascual and Jones, 2018) offered the following definitions/ assessments:

- Marine mining refers to exploration, exploitation and extraction of marine minerals, such as iron ore, tin, copper, manganese and cobalt; the sector is characterised as growing;
- Deep-sea mining is done at depths from 800 to 6,000 m, primarily targeting deposits of polymetallic nodules, manganese crust and sulphides, and is in early stages of development – referred to as an emerging sector;
- The exploitation of marine aggregates is a mature sector that refers to exploration, exploitation, extraction and dredging of sand and gravel from the seabed, primarily for the purpose of construction and beach nourishment. Mining of aggregates had an estimated gross value added (GVA) of EUR 625 million and provided 4,800 jobs in Europe (EEA, 2015).

133. At a longer time scale, Rare Earth Elements (REE) that are present in deep-sea mud may also become strategic mining targets as land-based reserves become progressively less accessible (Piante and Ody, 2015) and demand for these resources is soaring especially with the massive electrification of the world economy. Seabed mining is thus likely to become a priority area of the maritime economy for further study, especially of the largely unknown but potentially significantly adverse environmental impacts.

134. Potential areas for seabed mining have been identified in the Mediterranean Sea, with sulphide deposits identified along the Italian and Greek coastlines (Piante and Ody, 2015). Results of the EC funded project GeoERA-MINDeSEA[32] revealed promising prospects in placer deposits near the coasts in the eastern Mediterranean – Greece and Cyprus, as well as ferromanganese crusts in the Western Mediterranean off the coasts of Spain and Morocco (Sakellariadou et al., 2022).

135. While the economic potential of deep-sea mining is assessed as significant, the Mediterranean is not considered a priority area for these activities. The UfM Blue Economy report concluded there were no projects that have been granted a mining license[33] in the Mediterranean and no deep-sea activities by 2017, with the exception of the 2007 exploration project in the Tyrrhenian Sea in Italy. The slow development of deep-sea exploitation in the Mediterranean can be partially attributed to low technological development in the region and the lack of a dedicated regulatory system (UfM, 2017). However, exploitation of the Mediterranean seabed may become more economically interesting with increasing global prices for relevant resources.

136. Potential environmental issues linked to deep-sea mining are not well known, which questions the sustainability of such a practice; the main pressures (with potential to cause harmful environmental consequences) are linked to extractive techniques, underwater noise and light, and water and/or chemical discharges (UNEP/MAP and Plan Bleu, 2020).

137. An attempt to identify and understand better potential environmental impacts from deep-sea mining undertaken within the MIDAS project (Managing Impacts of Deep-seA reSource exploitation project, partly funded by the EU, implemented over the period 2013 – 2016) resulted in a set of

[32] Launched in 2018 to map and to establish the metallogenic context for different seabed mineral deposits with economic potential in the pan-European setting.
[33] Any project or activity being planned in a country's continental shelf can not be conducted without explicit consent of that country and references in this report do not mean that consent has been obtained.

recommendations and best practices for ensuring relative sustainability of the industry, including creation of conservation zones where mining activities would be prohibited; these recommendations were taken into account for the regulations of the EU Member States for areas located in their Exclusive Economic Zones, as well as for the regulations of the International Seabed Authority for international waters (located more than 200 miles from a State's baseline) (UfM, 2017).

138. In the EU Communication on Blue Economy (EC, 2021) it is emphasised that marine minerals in the international seabed area cannot be exploited before the effects of deep-sea mining on the marine environment, biodiversity and human activities have been sufficiently researched, the risks understood and before it is demonstrated that the technologies and operational practices do not cause serious harm to the environment (EC, 2021). The recent "Marine Expert Statement Calling for a Pause to Deep-Sea Mining" has been signed by 704 marine science & policy experts from over 44 countries. The scientists "strongly recommend that the transition to the exploitation of mineral resources be paused until sufficient and robust scientific information has been obtained to make informed decisions as to whether deep-sea mining can be authorized without significant damage to the marine environment and, if so, under what conditions"[34].

139. Some statistics about marine mining are available for European countries: Overall, the share of the marine *Non-living resources* sector in the EU blue economy in 2019 was 0.2 % of jobs and 2.5 % of GVA (EU, 2022). The *Other minerals* sub-sector continues to be on the rise, with a GVA of about EUR 160 million of GVA (3 % of the GVA in the sector of *Non-living resources*) and employment of 1,426 in 2019, referring mainly to marine aggregates rather than to mining activities. More than 50 million m^3 of marine aggregates, primarily sand and gravel, are extracted from the European marine seabed, mostly for the construction industry, beach nourishment and sea defence construction (EU, 2022). The demand is expected to continue rising as the construction sector expands and coastal communities try to adapt to new pressures posed by climate change.

140. Extraction of marine aggregate material, together with dredging, is recognised as highly damaging to seabed habitats. These activities result in substantive (and often permanent) alterations to hydrodynamic and ecosystem processes. The main pressures linked to extraction/ dredging include seabed disturbance and disruption of habitat, disruption to wildlife, pollution and water contamination, and use conflicts (UNEP Finance Initiative, 2022).

Water abstraction

Freshwater resources

141. The Mediterranean region has been estimated to hold about 1.2% of the world's renewable water resources and is recognised as one of the most water-challenged regions in the world (IAI, 2021). The pre-existing water scarcity is being aggravated by population growth, urbanization, growing food and energy demands, pollution, and climate change (UNEP/MAP and Plan Bleu, 2020).

142. The ten largest Mediterranean river basins are the Nile (Egypt), Rhone (France), Ebro (Spain), Po (Italia), Moulouya (Morocco), Meric/Evros (Greece, Türkiye), Chelif (Algeria), Büyük Menderes (Türkiye), Axios/Vardar (Greece) and Orontes/Asi (Türkiye). In the last 50 years, a decline in water discharge from rivers (estimated at around 340 km^3) has been observed, resulting from multiple stressors such as decreasing precipitation, an increasing number of reservoirs and increasing irrigated areas (UNEP/ MAP and Plan Bleu, 2020).

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[34] https://www.seabedminingsciencestatement.org/.

143. Total renewable freshwater resources of the countries belonging to the Mediterranean Basin were reported[35] at between 1,212 km³ yr^{-1} and 1,452 km³ yr^{-1}, with Northern Mediterranean countries holding between 72 and 74% of the resources and the SEMCs sharing the remaining 26 to 28% (MedECC, 2020).

144. Analyses conducted towards preparation of the Fifth Assessment Report of the IPCC showed that by 2014, 44 out of 73 catchments[36] in the Mediterranean region were under high to severe water stress, with hotspots in southern Spain, Tunisia, Libya, Syrian Arab Republic, Lebanon, and Israel. Furthermore, it was assessed that except for France and the Balkans, all the catchments in the Mediterranean would be under high to severe water stress by 2050, mainly due to climate change (reduced mean precipitation and groundwater availability, increased frequency and duration of droughts etc.), leaving 34 million people under high water stress and 202 million under severe water stress (IAI, 2021). Water shortages, especially pronounced during the summer, coincide with tourism peaks in coastal areas.

Water withdrawals

145. Total freshwater withdrawals in the Mediterranean countries were at the level of 290 billion m^3 in 2019 (FAO Aquastat). The largest consumers were Türkiye and Egypt with 61.5 and 77.5 billion m^3 respectively; freshwater withdrawals of around 10 billion m^3 or higher were recorded in Algeria, Greece, Morocco, Syrian Arab Republic, France, Spain and Italy. Per capita withdrawals ranged from less than a 150 m^3 to close to 1,000 m^3 (
146. Table *7*).

Table 7: Freshwater withdrawals per capita and by sector, 2019

	Total freshwater withdrawal (10^9 m^3/ year)	**Total withdrawal per capita (m^3 pc/ year)**	**Withdrawals by sector (%)**		
			Agriculture	**Municipal**	**Industrial**
AL	1.13	392.58	61.2	21.0	17.8
DZ	9.802	243	63.8	34.4	1.8
BA	0.3055				
HR	0.67	176.74	11.0	62.6	26.4
CY	0.202	231.11	59.9	40.1	0.0
EG	77.5	772	79.2	13.9	7.0
FR	26.85	412.24	11.1	19.8	69.1
GR	10.115	965.77	80.2	16.7	3.2
IL	1.16	272.09	51.4	43.1	5.5
IT	34.05	564.62	49.7	27.8	22.5
LB	1.812	268.39	38.0	13.0	48.9
LY	5.72	860.21	83.2	12.0	4.8
MT	0.041	143.06	36.5	61.9	1.6
MC	0.005	128.32	0.0	100.0	0.0
ME	0.16	256.22	1.1	59.9	39.0
MA	10.573	286	87.8	10.2	2.0
SI	0.944	454.11	0.3	18.0	81.7

[35] In the MedECC's First Mediterranean Assessment Report, based on the data of the FAO's Aquastat database and previous research.
[36] Areas where water is collected by the natural landscape.

ES	29.469	630.53	65.3	15.3	19.4
SY	13.964	981.86	87.5	8.8	3.7
TN	3.781	328.76	76.3	22.5	1.2
TR	61.534	742.18	87.7	10.6	1.7

(Source: FAO, 2023. AQUASTAT Core Database. Food and Agriculture Organization of the United Nations. Database accessed on 21 February 2023).

147. Irrigated agriculture is the most water-demanding sector accounting for nearly 80% or more of total withdrawals in Egypt, Greece, Libya, Morocco, Syrian Arab Republic, Tunisia and Türkiye.

148. Besides freshwater withdrawals, a total of 6.6 billion m^3 of treated wastewater is used across the region, primarily in Egypt, Spain, Israel, France and Greece. Israel is the leader among the SEMCs when it comes to reuse of treated wastewater (with a rate of over 85% of collected wastewater). Among the EU Mediterranean countries, Cyprus and Malta are the most advanced with 90% and 60% of their treated wastewater reused (UNEP/ MAP and Plan Bleu, 2020, based on IPEMED, 2019).

149. The largest producers of freshwater through desalination in 2019 were Israel (645 million m^3), Algeria (631 million m^3), Spain (405 million m^3) and Egypt (200 million m^3). Malta is the desalination leader in terms of percentage of desalinated water in national water consumption, with more than half of its drinking water supply produced via desalination (UNEP/MAP and Plan Bleu, 2020). Morocco produced 6.3 million m3 of desalinated water on its Mediterranean coast in 2022 (ONEE Water Branch). The available projections suggest that the production of desalinated water in the Middle East and North Africa (MENA) region will increase thirteen times by 2040 in comparison with 2014 (Ibid.)

150. According to De Roo et al., the Mediterranean is a water scarce region already under current climate and water use conditions, with high ratios of water abstraction and consumption compared to water availability, where regional groundwater depletion is already an issue. Under the scenario of global warming of 2ºC, projections indicate that the water availability in the Mediterranean could decrease by 10 – 30% locally. In such a context, implementation of irrigation and urban water efficiency measures gains importance. Water reuse is seen as an important measure to reduce abstractions, but the costs of treatment for reuse (as per the new EU standards) may exceed the current willingness to pay for water in agriculture. Desalination could become an increasingly applied option (De Roo et al., 2021).

151. Anthropogenic water abstractions are likely to impact freshwater-seawater dynamics in the Mediterranean basin, in combination with natural and climate-change induced variations of water flow into the sea. Water abstractions include both freshwater abstractions from the catchments that change the characteristics of freshwater reaching the coastal and marine environment, and coastal saltwater abstractions for the purpose of producing drinking water via desalination.

152. Freshwater abstractions in catchments may result in diversions and reductions in freshwater flow, alterations of timing and rates of flow to estuarine and coastal systems, and/or adverse water quality conditions with major changes in nutrient loading. This can affect sediment loads, pH, temperature, salinity, clarity, oceanography and nutrients. The effects of such changes can include mortality, changes in growth and development, and in some cases movement of organisms (Gillanders & Kingsford, 2002).

153. Desalination is the process of removing salts from water. A by-product of this process is toxic brine which can degrade coastal and marine ecosystems unless treated. For every litre of potable water produced, about 1.5 litres of liquid polluted with chlorine and copper are created in most desalination processes. The toxic brine depletes oxygen and impacts organisms along the food chain when pumped back into the sea (UNEP, 2019). Desalination also comes with a high energy demand. Using renewable energy sources for desalination can be an option to mitigate carbon emissions stemming from desalination.

Wastewater and waste disposal

Waste generation in the Mediterranean

154. According to the latest available data (as presented in

155. Table *8*), more than 198 million of tonnes of municipal solid waste (MSW) is generated in the Mediterranean countries[37] annually - an average of around 400 kg per capita per year (or 1.1 kg a day), ranging from less than 0.6 kg/day to more than 3.3 kg/day.

Table 8: Municipal waste generation and recycling rates in Mediterranean countries[38]

Country	**Year**	**MSW (t)**	**MSW pc (kg/y)**	**Share of MSW recycled**	
				%	year
MA	2014	7,126,000	202	8	2014
SY	2009	4,500,000	216	2.5	--
TN	2014	2,686,000	219	4	2014
EG	2016	22,000,000	284	12	2013
DZ	2016	12,378,740	305	8	2016
BA	2015	1,248,718	353	n.a.	--
LB	2014	2,149,000	358	8	2015
AL	2019	1,087,447	381	18.1	2020
LY	2011	2,420,000	385	n.a.	--
TR	2019	35,374,156	424	11.3*	2019
HR	2019	1,810,038	445	29.5	2020
ES	2019	22,408,548	476	36.4	2020
IT	2019	30,088,400	499	51.4	2020
SI	2019	1,052,325	504	59.3	2020
GR	2019	5,615,353	524	21	2020
ME	2018	329,780	530	4.6	2020
FR	2019	36,748,820	548	42.7	2020
CY	2019	769,485	642	16.6	2020
MT	2019	348,841	694	10.5	2020
IL	2021	6,150,962	656	23.5	2021
MC	2012	46,000	1,217	5.4	--
Med		**198,347,650**	**400**		

[37] Close to 97 million in the SEMCs and around 101 million in the NMCs. The regional/ sub-regional sums were derived from the data referring to 2019 for most NMCs and Türkiye, while the last available data for the SEMCs mainly refer to the period 2014 – 2016; data for Syrian Arab Republic and Libya were only available for 2009 and 2011 (respectively).
[38] Covering all marine façades of multi-façade countries.

Note: own calculation based on the data from EEA and UNEP/ MAP, 2021 and on data from the Ministry of Environmental Protection of Israel, 2023. Sources: World Bank What a Waste Global Database[39], EEA and UNEP/MAP, 2021, EEA, 2023, Ministry of Environmental Protection of Israel, 2023

Colour	Countries with annual MSW generation (kg/pc)
	200 – 300
	300 – 400
	400 – 500
	≥ 500

156. Total quantities of e-wastes generated in the Mediterranean countries are at the level of 8.3 millions of tonnes, while generation of hazardous wastes exceeds 28.5 millions of tonnes annually (World Bank database, accessed January 2023).

157. As regards the MSW composition, organic materials represent the main fraction in most of the SEMCs, accounting for as much as 68% in Tunisia and 70% in Libya (World Bank database, accessed January 2023). Share of plastics ranges from few percent to more than a fifth of the total quantity and is generally higher in the NMCs (Ibid.).

158. MSW generation has been increasing across the Mediterranean and a growing trend is expected to continue in the coming decades. While municipal waste generation in the NMCs is significantly higher compared to the SEMCs, waste management systems are more advanced. Despite notable improvements, collection of MSW is still a significant issue in most SEMCs where only a few countries are succeeding in reaching full waste collection coverage (EEA and UNEP/ MAP, 2021), whereas collection services are, as a rule, underdeveloped in rural areas, suburbs and slums.

159. According to EEA and UNEP/ MAP report (2021), more than a half (54%) of total MSW is, on average, disposed at open dumps in the SEMCs[40], while the share goes to as high as 80% in some countries. Landfilling (different types of landfills) has been reported as the main disposal option in Algeria (accounting for 89% of total MSW), Israel (75%) and Tunisia (70%). On the other hand, the overall landfill rate – waste sent to landfill as a share of generated waste – decreased from 23% to 16% during 2010 and 2020 in the EU as a whole, in line with the objective of reducing reliance on landfilling; total quantity of waste sent to landfill in this period decreased by 27.5% – from 173 million tonnes to 125 million tonnes[41].

160. Reported recycling rates are mainly below 10% in the SEMCs, except for Egypt where the rate is higher (12%) due to a significant impact of informal recycling activities, and Israel (where nearly a quarter of MSW is recycled). Recycling rates are also low in Türkiye (around 11%) as well as in the non-EU NMCs (

161. Table *9*); with a recycling rate of 18.1% in 2020, Albania made a significant step forward in recent years (Figure 20). Over the past 15 years, the EU Mediterranean countries made significant progress with recycling, with Slovenia and Italy doubling the recycling rates and countries like Croatia and Cyprus increasing the rates by as much as eight and four times respectively (Figure 20). Nevertheless, recycling rates in most EU Mediterranean countries (the only exceptions being Slovenia

[39] According to the World Bank, information presented in the database is the best available based on a study of current literature and limited conversations with waste agencies and authorities. While it is recognized variations in the definitions and quality of reporting for individual data points might exist, the general trends depicted by the database records are believed to be representative of the global reality.
[40] Including Jordan.
[41] https://www.eea.europa.eu/ims/diversion-of-waste-from-landfill accessed January 2023.

and Italy) were well below the EU-27 average and are particularly low in Malta (10.5%) and Cyprus (16.6%).

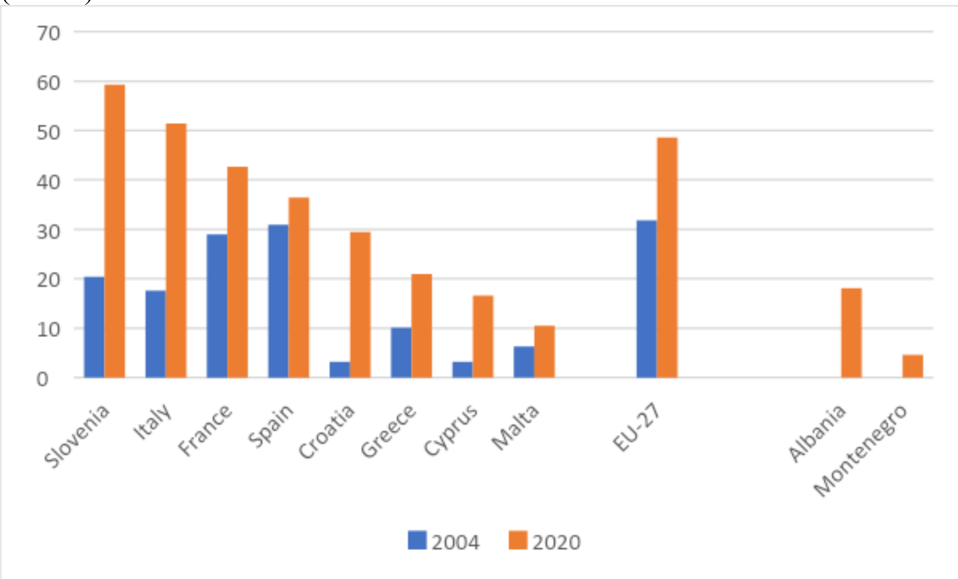

Figure 20: Recycling rates in the Mediterranean EU Member States, Albania and Montenegro (2004 and 2020).
(Source: https://www.eea.europa.eu/ims/waste-recycling-in-europe accessed February 2023).

Wastewater

162. Total municipal wastewater generation in the riparian countries of the Mediterranean Sea was at the level of 32,872 million m^3 (Mm^3) per year (
163. Table *9*). Around three quarters of produced wastewater (24,847 Mm^3) were treated (FAO, 2023), with uneven treatment shares across the region.

Table 9: Generation and treatment of municipal wastewater, 2017-2019

Country	**Municipal WW (Mm3/year)**		**Treated WW share (%)**
	produced	**treated**	
AL	54.0*	20.5	38.0
DZ	1,500.0	400.0	26.7
BA	82.3	57.0	69.2
HR	360.0	300.0	83.3
CY	30.0	30.0	100.0
EG	7,078.0	4,282.0	60.5
FR	4,000.0	3,770.0	94.3
GR	568.0*	568.0	100.0
IL	500.0	450.0	90.0
IT	3,926.0	3,902.0	99.4
LB	310.0	56.0	18.1
LY	504.0	40.0	7.9
MT	26.0	24.0	92.3
MC	8.0	6.0	75.0
ME	31.0	9.5	30.6
MA	700.0 *	166.0 *	23.7 *
SI	241.0	158.0	65.6
ES	5,870.0	5,465.0	93.1
SY	1,370.0	550.0	40.1
TN	312.0	274.0	87.8
TR	5,280.0	4,236.0	80.2
Med	**32,872.3**	**24,847.0**	**75.6**

Notes: For Albania, data on produced wastewater was used as reported in EEA and UNEP/ MAP, 2021 (data recorded in the database seems to be an outlier). For Greece, data on produced municipal wastewater was not available in the database; data on collected wastewater is recorded instead. For Morocco, alternative data with different reference years is available as follows: Volume of wastewater produced by households 1,513.46 1000M3/day in 2015 (Source: Eurostat, ONEE/Water Branch), Volume of wastewater treated in urban wastewater treatment plants 1,027 1000M3/day in 2019 (Source: Eurostat, ONEE/Water Branch), ratio of treated wastewater 56% in 2020 (Source: 4th Report on the State of the Environment of Morocco).
(Source: FAO AQUASTAT Core Database accessed on 17 February 2023).

164. The analysis conducted for the EEA and UNEP/ MAP report (2021) showed that wastewater generation was on the rise across the region (resulting mainly from population growth and fluctuations from tourism), as was the case with wastewater collection and treatment. The largest volumes are generated by the Mediterranean EU countries, where almost all the produced municipal wastewaters (96% on average) are treated. While significant progress with wastewater treatment has been achieved in the non-EU NMCs and most of the SEMCs during the past decade, significant volumes (estimated at around 5 km^3/year) of wastewater are still discharges untreated into the environment, streams, wadis or directly into the sea (EEA and UNEP/ MAP, 2021). The instability in Lebanon, Libya and Syrian Arab Republic have either resulted in the shutting down of wastewater treatment plants or the suspension of constructing new ones (Ibid.).

165. Inadequate levels of treatment are a key challenge in the Mediterranean, with 21% of treated wastewater (25% in southern countries) undergoing only basic treatment, and less than 8% (1% in southern countries) undergoing tertiary treatment (UNEP/MAP and Plan Bleu, 2020, EEA and UNEP/MAP, 2021).

166. The achieved progress with waste and wastewater management is not sufficient to curb the pressures and that further reduction in key pressures, such as waste and marine litter, wastewater and industrial emissions, is required to achieve a clean Mediterranean and the Good Ecological Status of its sea.

Infrastructure: underwater cables and pipelines

Underwater cables

167. Over the past 15 years, the Mediterranean region has seen a rapid spread of information and communication technologies (ICTs), with, for example, the total number of mobile cellular telephone subscriptions doubling between 2005 and 2021 to exceed 580 million. The share of the population using the internet has increased by several folds in a number of countries, most notably in Albania and Algeria, but also in Lebanon, Tunisia, Syrian Arab Republic, Egypt, Morocco and Türkiye. As of 2021, the share of internet users in the national populations is above 70% in almost all the Mediterranean countries, and above 90% in Cyprus, Israel and Spain. The number of mobile-cellular subscriptions per 100 inhabitants is the lowest in Libya (around 43) and remains below 100 in Albania, Egypt, Lebanon and Syrian Arab Republic.

168. Submarine cables are deployed in an imbalanced way throughout the Mediterranean Sea, promoting connections of the most developed regions of the world. This contributes to maintaining a digital divide for the SEMCs where despite remarkable progress, significant shares of the population remained excluded from the use of ICTs (because of inability to access technologies or lack of skills to use them). The digital transition seemed to be slower and mainly focused on urban areas in Algeria, Egypt, Libya, Tunisia and Syrian Arab Republic (UNEP/ MAP and Plan Bleu, 2020).

Pipelines.

169. An overview of the existing and planned oil and gas pipelines (onshore and underwater) for the Mediterranean is not available.

170. One of the older gas conveyors is the 2,475 km long Trans-Mediterranean Pipeline built in 1983 to transport natural gas from Algeria to Italy via Tunisia and Sicily, with a capacity of more than 33.5 billion cubic metres a year (bcm/ yr)[42]. Several new gas pipelines, such as the Trans-Adriatic and EastMed Pipelines are planned to respond to the need for an increased gas supply to Europe and to diversify natural gas import routes by the EU. The recent construction of the TANAP (Trans-Anatolian Pipeline) is planned to establish a connection to the Trans-Adriatic Pipeline to reach Greece and Italy, and provide the EU with access to 16 bcm/ yr of gas extracted by Azerbaijan from the Caspian Sea (UNEP/ MAP and Plan Bleu, 2020).

Coastal development and artificialisation of coastline

171. Due to a range of amenities (including favourable climate, landscape, cultural, recreational and other benefits) and development and employment opportunities (activities analysed above), Mediterranean coastal areas are among the most sought-after areas. They are frequently an end point

[42] https://www.hydrocarbons-technology.com/projects/trans-med-pipeline/

for internal migration flows, including rural – urban population movements, and coastal areas are also highly valued as locations for secondary/ holiday homes. Through this high density of human presence and activity, the coastal zone concentrates pressures on the environment.

172. The total length of the Mediterranean coasts is more than 57,000 km (UNEP-GRID, 2017). Many of the major cities in Mediterranean countries are located on the coast. The share of urban population increased steadily across the region, standing at or above 70% in over half the countries (Algeria, France, Greece, Israel, Italy, Lebanon, Libya, Spain, Malta, Tunisia, Türkiye) in 2021. Egypt is the only Mediterranean country where rural population (around 57% in 2021) still prevails, while the shares of rural and urban population are about the same in Bosnia and Herzegovina (World Bank, 2022).

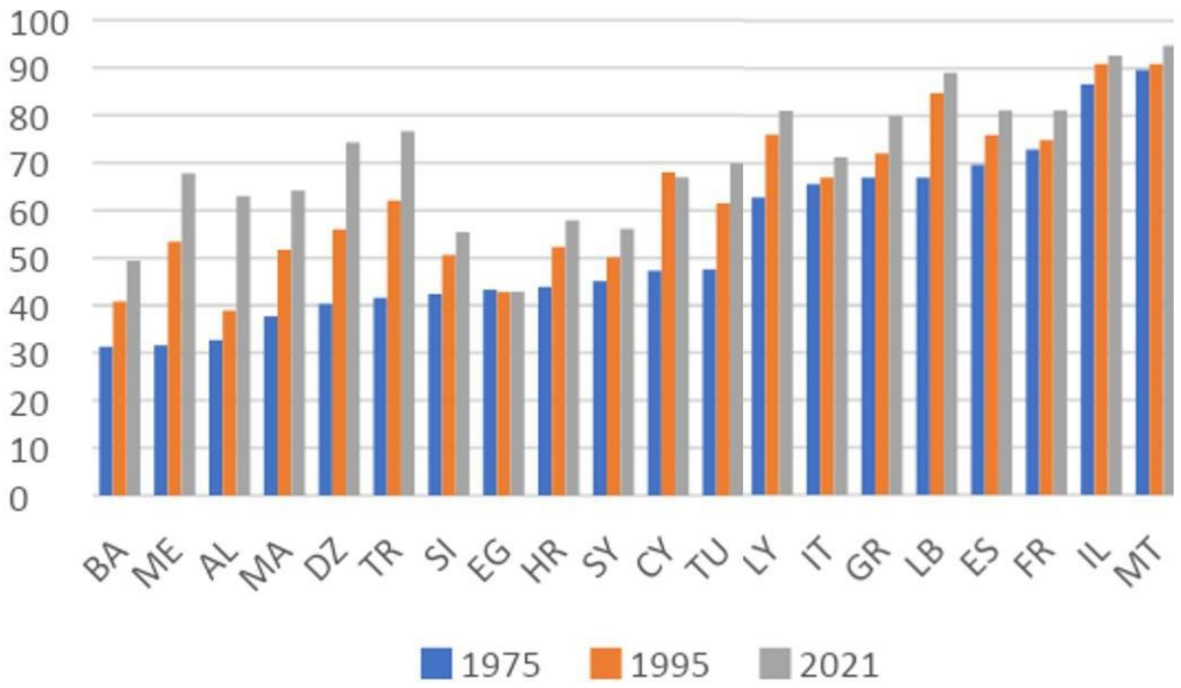

Figure 21: Shares of urban population across the Mediterranean 1975 – 2021
Source: World Development Indicators | DataBank (worldbank.org), accessed November 2022.

173. Approximately one third of the total Mediterranean population (170 – 180 million in 2021) lives in coastal areas. Shares of coastal population range from 5% in Slovenia to 100% in island countries (Cyprus, Malta) and Monaco. Population densities in coastal areas have continued to increase at unsustainable rates over the last decade. Rapid growth of urban and peri-urban areas is recorded all over the Mediterranean.

174. Intensification of coastal uses is at the origin of many impacts that alter the invaluable capital that is the Mediterranean, leading to increased fragmentation of landscapes, disrupting ecological continuity and degrading the environment's capacity to provide ecosystem services to society. It also makes coastal zones highly vulnerable to sea level rise, storm surges, flooding and erosion (UNEP/MAP and Plan Bleu, 2020; Grimes et al., 2022).

175. A detailed analysis of the location and extent of the habitats potentially impacted by hydrographic alterations, the length of coastline subject to physical disturbance due to the influence of human-made structures, and land cover change is given in the 2023 MED QSR chapter on coast and hydrography.

1.1.1 1.2.5.10 Fertiliser and pesticide use in agriculture

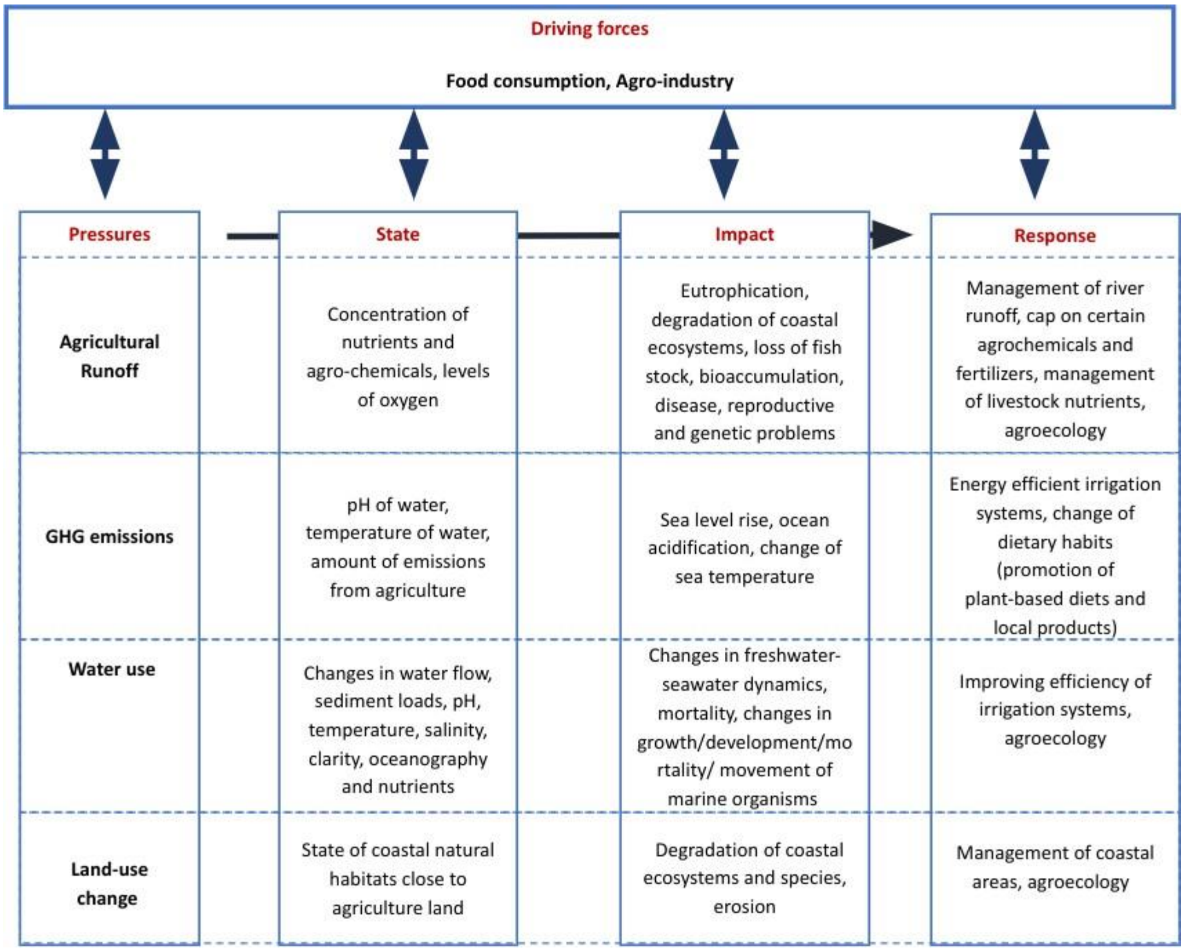

Figure 22: Pressures exerted by agriculture on the marine environment
(Source: Based on UNEP/MAP and Plan Bleu, 2020)

176. The main impacts of agriculture on the marine environment are due to the runoff of nutrients and agro-chemicals into the sea. Disaggregation of the impact from different sources of land-based pollution is difficult and there is no quantitative data concerning the effect of agriculture on the environment of the Mediterranean Sea. The runoff of inorganic nitrogen and phosphorus fertilizers leads to eutrophication, which in turn negatively impacts coastal and marine ecosystems. The runoff and infiltration of pesticides into the sea affect the marine environment at a slower pace by bioaccumulation higher up the food chain (UNEP/MAP and Plan Bleu, 2020).

177. In 2020, fertilizer consumption in kg/ha of arable land ranged from 7 kg/ha in Syrian Arab Republic to 473 kg/ha in Egypt, with half of the Mediterranean countries being above and half of the Mediterranean countries being below the world average fertilizer consumption of 146 kg/ha of arable land (World Bank, 2023).

Table 10: Fertilizer consumption in kg/ha of arable land, in Mediterranean countries, 2017-2020

Country	2017	2018	2019	2020
AL	100	67	94	101
BA	106	85	87	90
CY	175	158	188	163
DZ	21	21	21	21
EG	574	522	495	473
ES	155	158	157	167
FR	178	172	157	169
GR	130	135	141	150
HR	214	221	212	200
IL	230	241	231	140
IT	130	130	128	136
LB	293	275	279	249
LY	26	16	19	15
MA	60	63	65	58
MC	no data	no data	no data	no data
ME	234	247	252	307
ML	93	89	96	127
SI	257	262	255	256
SY	3	2	7	7
TN	49	57	57	57
TR	132	110	126	150
World	141	140	138	146

Source: World Bank, 2023

178. The consumption of pesticides in the Mediterranean basin varies largely between countries. In 2020, the average use of pesticides in kilograms per hectare of cropland ranged from 0.3 kg/ha in the Syrian Arab Republic to 14.5 kg/ha in Israel. Almost two thirds of the Mediterranean countries showed pesticide consumption above the world average of 1.8 kg/ha (FAOstat, 2023). Pesticides, especially if used irrationally, can lead to animal and human health problems such as the inability to reproduce normally in certain animal species, or cancer, neurological effects, diabetes, respiratory diseases, foetal diseases, and genetic disorders in humans who have been directly or indirectly exposed to certain pesticides (UNEP/MAP and Plan Bleu, 2020). Managing this type of pollution is particularly difficult because of its diffuse nature and largely unknown combined effects of multiple types of pesticides and their life cycles in the terrestrial and marine environment.

Table 11: Use of pesticides in kg/ha of cultivated land, in Mediterranean countries, 2017-2020 (Source: FAOstat, 2023).

	2017	2018	2019	2020
AL	0.9	0.6	1.1	1.1
BA	2.2	2.3	2.2	2.4
CY	9.7	9.6	10.3	9.2
DZ	0.7	0.7	0.7	0.7
EG	2.6	2.9	2.9	2.9
ES	3.6	3.3	2.6	2.6
FR	3.6	4.5	2.9	3.4
GR	2.6	3.5	3.4	3.3
HR	1.8	1.9	1.7	1.7
IL	14.3	15.2	14.6	14.5
IT	6.1	5.9	5.2	6.1
LB	6.6	6.7	6.7	6.7
LY	0.3	0.4	0.4	0.4
MA	1.4	1.4	1.6	1.5
ME	6.2	6.2	6.1	6.2
SI	4.6	5.0	4.2	4.1
SY	0.3	0.3	0.3	0.3
TN	0.5	0.7	0.7	0.7
TR	2.3	2.6	2.2	2.3
World	1.9	1.8	1.8	1.8

Table 12: Agricultural use of pesticides in tons (Source: FAOstat, 2023)

	2017	2018	2019	2020
AL	6,067	6,067	6,067	6,067
BA	2,517	2,545	2,514	2,723
CY	1,163	1,246	1,271	1,218
DZ	615	442	730	757
EG	9,988	11,352	11,352	11,352
ES	60,896	55,223	43,337	43,337
FR	70,604	85,072	54,381	65,216
GR	8,503	11,199	11,032	10,475
HR	1,570	1,677	1,558	1,644
IL	6,881	7,322	6,983	6,983
IT	56,641	54,153	48,567	56,556
LB	1,816	1,816	1,816	1,816
LY	649	788	788	788
MA	13,697	13,697	13,697	13,697
ME	91	91	91	91
MT	98	89	102	102
SI	1,087	1,172	972	949
SY	1,422	1,422	1,422	1,422
TN	2,670	3,211	3,511	3,511
TR	54,098	60,020	51,297	53,672

A need to anticipate emerging and fast-growing new activities

179. Faced with the lack of space along coastlines and the pressure of emerging maritime activities, the permanent occupation and exploitation of the sea is developing from the coast to offshore: creation of artificial islands, ports, and wind farms, telecommunications and energy cables as well as pipelines; exploration and exploitation of until now untouched marine resources, represent a new field of experimentation, development, impact and potential conflict. The increasing presence of infrastructure at Sea, and particularly infrastructure of strategic importance for energy and data/communications supply, also comes with a need for countries to protect this infrastructure in a generally tense geopolitical and security context faced in the Mediterranean. Therefore, some of the activities at Sea are likely to trigger the emergence of other potentially polluting activities at Sea, including surveillance activities and potentially military interventions. New activities at Sea seldomly limit their presence and impact to the Sea because they need to be connected to the shore in order to allow use of their products on land (energy, minerals, landing terminals and hinterland infrastructure onshore, …). All of these activities modify - at least temporarily - the marine and/or coastal environment. Making these activities compatible with GES, already in the planning phase, is therefore essential for the achievement of GES in the Mediterranean.

Knowledge gaps

180. This chapter provides an analysis of the main socio-economic components that influence the Mediterranean coastal and marine environment. Analysis is based on available data from a number of different sources, such as UN system data, data from international organisations, and relevant scientific articles. The absence of a comprehensive monitoring system of socio-economic characteristics and the sustainability of economic activities makes it difficult to establish clear links between the quality status of the Mediterranean Sea (analysed in the following chapters) and the social and economic pillars of sustainable development (analysed in this chapter). In particular, while a certain level of information on demographic, economic and employment has been collected, literature review did not adequately inform the level of environmental and social sustainability of human activities that impact the coastal and marine environment. A knowledge gap remains in measuring to what extent human activities are compatible or in line with the objective of achieving GES and clear sustainability indicators of human activities are generally lacking.

Regional cooperation

181. The Barcelona Convention, adopted in 1976, was the first legally binding instrument for the environmental protection of the Mediterranean Sea. Its provisions and thematic protocols provided the legal basis for the progressive development of a wide framework for regional cooperation to which the Mediterranean countries and the European Union adhered.

182. In addition to its legal texts, the Barcelona Convention system has other consultation and cooperation frameworks adopted by the Contracting Parties to assist them and coordinate their efforts in implementing the Convention and its Protocols.

183. The Mediterranean Commission on Sustainable Development (MCSD): The MCSD is an advisory body to the Contracting Parties aimed at assisting them in their efforts to integrate environmental issues in their socioeconomic programmes and to promote sustainable development policies in the Mediterranean region and countries. Serving as a forum for experience sharing and peer learning, the MCSD is unique in its composition since it includes not only government representatives but also local authorities, socio-economic actors, non-governmental organizations, intergovernmental organizations, the scientific community and parliamentarians. All the Commission members participate in its deliberations on an equal footing.

184. The Contracting Parties also adopted a series of legislations, national and regional strategies and action plans aimed at guiding their efforts in addressing issue of relevance for the objectives of the Convention and its Protocols. These regional strategies and action plans offer various opportunities for cooperation, exchange of experience and mutual assistance among the Contracting Parties and for partnership with other Inter-Governmental organizations as well as with a wide range of civil society and non-governmental organisations.

185. Promoting partnership and cooperation with relevant regional and global institutions and actors is among the key guiding principles followed by the Mediterranean Action Plan (MAP) Coordinating Unit and the Regional Activity Centres. Over the years, they have sought to foster existing partnerships and to enter into new ones in line with the priorities set by the Contracting Parties to the Barcelona Convention and its Protocols. In this context, the UNEP/MAP Coordinating Unit has a long-standing cooperation with a number of key regional and international organizations, and with many of them put in place Memoranda of Understanding and/or follows other cooperation modalities:

- ✓ Agreement on the Conservation of Cetaceans of the Black, Mediterranean Sea Sea and contiguous Atlantic Area (ACCOBAMS)
- ✓ Baltic Marine Environment Protection Commission (HELCOM)
- ✓ Basel, Rotterdam, and Stockholm (BRS) Conventions
- ✓ European Environment Agency (EEA)
- ✓ Food and Agriculture Organization of the United Nations (FAO)
- ✓ General Fisheries Commission for the Mediterranean (GFCM)
- ✓ Global Environment Facility (GEF)
- ✓ International Atomic Energy Agency (IAEA)
- ✓ International Maritime Organization (IMO)
- ✓ International Union for Conservation of Nature (IUCN)
- ✓ London Convention and Protocol
- ✓ London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter
- ✓ OSPAR Commission
- ✓ Permanent Secretariat of the Commission on the Protection of the Black Sea Against Pollution (BSC PS)
- ✓ UNEP Regional Seas programme
- ✓ Union for the Mediterranean (UfM)
- ✓ United National Development Programme (UNDP)
- ✓ United Nations Educational Scientific and Cultural Organization (UNESCO)
- ✓ World Bank

186. During the period between the 2017 and 2023 Med QSRs a clear improvement is recorded in the coordination between regional organizations operating in the Mediterranean in relation to the preservation of the marine environment and the sustainable use of its biodiversity and living resources. Within this framework, memoranda of collaboration have been established between organizations with a view to promoting consultation and harmonization of activities to avoid duplication and to increase the complementarity of their intervention. In addition, projects involving several regional organizations have been implemented thanks to financial support provided by intergovernmental donors and private foundations. Such projects concerned various important issues for the marine environment of the Mediterranean such as marine litter, marine underwater noise, incidental catches of vulnerable species, habitat preservation and endangered species.