Decision IG.24/4

Assessment Studies

The Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols at their 21st Meeting,

Recalling the outcome document of the United Nations Conference on Sustainable Development, entitled "The future we want", endorsed by the General Assembly in its resolution 66/288 of 27 July 2012,

Recalling also General Assembly resolution 70/1 of 25 September 2015, entitled "Transforming our world: the 2030 Agenda for Sustainable Development",

Recalling further the Environment Assembly resolution of 15 March 2019, UNEP/EA.4/Res.23 entitled "Keeping the world environment under review: enhancing the United Nations Environment Programme science-policy interface and endorsement of the Global Environment Outlook",

Having regard to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and its Protocols, and in particular Article 4 thereof on general obligations,

Recalling Decision IG.23/4 on the "Implementation and Monitoring of the Mediterranean Strategy for Sustainable Development 2016-2025 and of the Regional Action Plan on Sustainable Consumption and Production in the Mediterranean", requesting the Secretariat to present progress of MED 2050 Phase I at the 21st Meeting of the Contracting Parties (COP 21),

Deeply concerned with the increasing pressures on the Mediterranean marine and coastal environment, as highlighted in the 2012 State of the Mediterranean Marine and Coastal Environment and the 2017 Mediterranean Quality Status Report (MED QSR), and with the continuing unsustainable consumption and production patterns in the region,

Recognizing that there are gaps in the knowledge of the state of the environment and that there is an urgent need to continue to strengthen efforts to bridge those gaps through building and reinforcing existing mechanisms,

Expressing appreciation for the work undertaken by the Contracting Parties, members of the Mediterranean Commission on Sustainable Development, the Mediterranean Action Plan (MAP) Partners, members of the Steering Committee and of the Scientific Board, the Secretariat and the MAP components for the preparation of the 2019 Report on the State of the Environment and Development in the Mediterranean,

Appreciating also the progress being made by the network of Mediterranean experts on climate and environmental change (MedECC) on the first assessment report on the current state and risks of climate and environmental changes in the Mediterranean (MAR 1),

Recalling the mandates of all MAP Components and their relevance to the implementation of this Decision,

Having considered the conclusions of the meeting of the Plan Bleu Regional Activity Centre National Focal Points held in Marseille, France, on 28-29 May 2019, the 18th Meeting of the Mediterranean Commission on Sustainable Development held in Budva, Montenegro, on 11-13 June 2019, and the 7th Ecosystem Approach Coordination Group Meeting, held in Athens, Greece, on 9 September 2019,

1. *Approve* the summary for decision makers and key messages of the 2019 Report on the State of the Environment and Development in the Mediterranean (Annexes I and II) as important input for the definition of the 2022-2027 United Nations Environment Programme/Mediterranean Action Plan (UNEP/MAP) Medium-Term Strategy and other relevant policy and strategy developments of the MAP-Barcelona Convention system;

2. *Invite* the Contracting Parties to take concrete steps to incorporate the concerns raised in Annexes I and II to the present Decision in their environmental policies with the support of the Secretariat;

3. *Encourage* the Contracting Parties and the Secretariat to make all possible efforts to overcome the knowledge gaps that are identified in the 2019 Report on the State of the Environment and Development in the Mediterranean;

4. *Endorse* the 2023 MED QSR roadmap and needs assessment as contained in Annex V of this Decision and *request* the Secretariat to further define in 2020, together with the Contracting Parties and CORMONs concrete requirements and deadlines of output delivery at the level of common indicators per each Contracting Party in order to ensure effective data collection and to address knowledge gaps to enable the entire MAP system to successfully deliver the 2023 MED QSR;

5. *Endorse* the proposed revised roadmap for the MED 2050 foresight study, as contained in Annex III of the present Decision, and *request* the Secretariat to implement the proposed roadmap;

6. *Encourage* the Contracting Parties to participate in the phase II of MED 2050 foresight study, organise on a voluntary basis national or sub-regional workshops, and nominate relevant experts or interested national stakeholders including youth representatives to contribute to the study;

7. *Approve* the elements of the Roadmap for the Consultation of Decision-Makers and Stakeholders on the First Assessment Report on the Current State and Risks of Climate and Environmental Changes in the Mediterranean (MAR 1) as set out in Annex IV of the present Decision, involving the Mediterranean Action Plan Focal Points, the Mediterranean Action Plan Components' Focal Points, and the Mediterranean Commission on Sustainable Development;

8. *Also request* the Secretariat to undertake an extensive dissemination and communication campaign for the 2019 State of the Environment and Development in the Mediterranean Report and communication on the development of the MED 2050 Foresight Study and the Mediterranean Expert Network on Climate and Environmental Changes in the Mediterranean (MedECC) in the context of relevant consultation.

Annex I

2019 Report on the State of the Environment and Development in the Mediterranean (SoED 2019)

Key Messages

Table of Contents

Annex I: 2019 Report on the State of the Environment and Development in the Mediterranean (SoED 2019). Key Messages

I. Introduction: Linking 2017 MED QSR, SoED 2019 and MED 2050

1. Since the late 1970s, Mediterranean countries have agreed to cooperate to put "*at the disposal of political leaders and decision-makers all information that will enable them to develop plans likely to ensure sustained optimal socio-economic development without degrading the environment*"[1]. To continue fulfilling this objective, Mediterranean countries have asked the Secretariat of the Barcelona Convention to produce three major reports from 2016 to 2021.

2. Published in 2018, the *Mediterranean 2017 Quality Status Report* (2017 MED QSR) was the first assessment based on the Mediterranean Action Plan Ecological Objectives and Integrated Monitoring and Assessment Programme (IMAP) indicators adopted in 2016 by all Mediterranean riparian countries, parties to the Barcelona Convention. Despite the limited availability of data and the fact that IMAP implementation was still in an early phase, the 2017 MED QSR provided relevant details on the status of the marine and coastal Mediterranean ecosystems and the achievement of Good Environmental Status (GES), using available data to document IMAP Common Indicators[2].

3. The Mediterranean State of the Environment and Development Report 2019 (SoED 2019) has a wider and more systemic scope. The SoED 2019 considers a range of sustainability issues related to the environment and development in the Mediterranean region and outlines their interactions. On marine ecosystems, for example, the SoED 2019 contributes to assess SDG 14: "Conserve and sustainably use the oceans, seas and marine resources for sustainable development". SoED 2019 thus puts IMAP indicators, among others, in the context of a network of causal links and interactions. The list of pressures and impacts identified in the SoED 2019 fully coincides with the key pressures and impacts on the marine environment identified in the 2017 MED QSR. The SoED 2019 further builds on the main messages of the 2017 MED QSR, addressing socio-economic aspects of major drivers and pressures present in the Mediterranean marine environment.

4. A regional foresight at horizon 2050, MED 2050, to be developed by 2021, will use both the 2017 MED QSR and SoED 2019 as baselines to explore scenarios and transition pathways towards a sustainable and inclusive future in the Mediterranean.

5. The three exercises will help Mediterranean decision-makers in identifying key areas requiring further joint or coordinated action, and drawing elements for the future Mediterranean Action Plan (MAP) Medium Term Strategy 2022-2027.

II. Major drivers and pressures, and associated trends

6. **Despite their differences, Mediterranean countries remain strongly connected**. Countries along the Mediterranean Sea share a common heritage, analogies in lifestyle and values, exposure to climate and environmental risks and impacts, urbanisation and coastal erosion, and an increasing tourism pressure. Contrasts are also important, with different demographic dynamics, access to natural resources, income, investment in environmental protection, decentralisation policies, government and governance systems, measures in place to prevent corruption, guarantee public participation and accountability, ensure political stability and enforcement of legal frameworks, etc. These differences lead to large gaps in countries' capacities to prevent and adapt to potential crises. Southern and Eastern Mediterranean Countries (SEMC) are particularly exposed. At the same time, the region is connected through intense flows of people (migration and tourism), goods and energy products (especially via maritime transport), financial resources (foreign investment and cooperation), information and social interactions, as well as via environmental flows (riverine flows and marine currents), and policy fora. The Mediterranean Region remains thus an extremely relevant scale to assess environment and development interactions, but that requires considering sub-regional

[1] Inter-governmental Meeting, UNEP/IG.5/7, 1977
[2] Results are available on the following website: https://www.medqsr.org/fr

heterogeneities as well as connections beyond regional boundaries with Africa, Far East, and Northern Europe.

Main Fact 1 - Demographic trends: Population continues to grow in coastal and urban areas of the Mediterranean region, with a younger population in SEMC

7. **The population of the Mediterranean riparian States**[3] **amounts to approximately 514 million people in 2018**[4]**, representing 6.8% of the world population. While population has been stabilizing in the North since 1980, population in the South and East of the basin has more than doubled** (from 153 million in 1980 to 314 million in 2018) **and is expected to increase by an additional 122 million people by 2050**. In 2018, 39% of the Mediterranean countries' population live on the northern shore and 61% on the southern and eastern shores. In decreasing order, population growth rate in the past decades is highest in Palestine, Lebanon, Israel, Egypt, Algeria and Syria. The most populated country is Egypt with 98 million people in 2018, followed by Turkey (82 million) and France (67 million). 2018 population density is highest in Monaco, Malta and Palestine, and lowest in Libya (ranging from 4 to almost 26,000 people per km^2)[5].

8. **Demographic transition has been completed in two thirds of Mediterranean countries and is underway in the remaining ones**. The demographic convergence with northern Mediterranean countries (NMC) is striking in Lebanon, Tunisia and Turkey. In Morocco and Libya, where fertility continues to decline, this convergence is only a few years away. This trend is coherent with an increasing urbanization, as in demographic transition fertility rates generally decline fastest in urban areas and remain highest in the most remotely settled and rural zones. Contrary to earlier projections, the demographic transition seems to have come to either a halt or a new increase in Algeria and Egypt. All south-eastern Mediterranean countries (SEMC) show a fertility rate at or above the replacement rate of 2.1, leading to population growth, except Lebanon (1.7). In Egypt, Israel and Palestine, fertility rates exceed the symbolic threshold of three children per woman. Fertility is below replacement rate in all NMC, leading to population decrease and aging.

9. **Population in SEMC is 14 years younger than in the north**. While the average median age in SEMC ranges from 20 to 31, in NMC the average median age is between 34 to 45.

10. **Around 70% of Mediterranean population lives in urban areas**. Urban population has continued to increase throughout the region in the last decade with more than half of the population being urban in 2017 in all countries except for Egypt (57% rural population) and Bosnia and Herzegovina (52%). A new phenomenon is the decline in absolute numbers of the rural population in Albania (- 2,4%), Croatia (-1%), Montenegro (-1%), Algeria (- 0,4%), Slovenia (-0,5%), and Turkey (-0,5%), while Egypt still registers an annual growth of 2% of its rural population. The continuing urbanisation comes with an increase in the number of inhabitants in Mediterranean metropoles, which challenges urban planning, including transport and environmental infrastructure.

11. **In Mediterranean countries, one out of three persons lives in a Mediterranean coastal region**[6]. The share of the coastal population ranges from 5% in Slovenia to 100% in island countries (Cyprus, Malta) and Monaco. Coastal urbanization is partly driven by tourism, with Mediterranean countries hosting more than 337 million international tourist arrivals (ITAs) per year, about 27% of world tourism in 2016[7], largely concentrated in coastal zones and summer months.

[3] Including State of Palestine
[4] United Nations, Department of Economic and Social Affairs, Population Division (2019), World Population Prospects 2019, online edition
[5] United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, online edition
[6] Plan Bleu computations, national sources (referring to NUTS 3 or equivalent)
[7] World Tourism Organization (2018), UNWTO Tourism Highlights, 2018 Edition

<u>Main Fact 2</u> - Human development: While education and health have considerably progressed in the south and east of the basin, large north-east/south divides remain driven by persistent GDP gaps and are aggravated by conflicts

12. **The economies of Mediterranean countries have undergone important variations between 2007 and 2017, struck by the global financial crisis in 2008 and the European debt crisis starting late 2009**. All European Mediterranean countries witnessed a downturn of their GDP per capita between 2008 and 2009. Ten years later, Cyprus and Greece, particularly struck by the European debt crisis, have not recovered their pre-crisis GDP per capita. South Mediterranean countries have shown a surprising resilience to the 2008 crisis, but the added political instability and conflicts since the Arab Springs has left the region with relatively low growth rates.

13. **In spite of demographic growth, geopolitical difficulties, human development,** as measured through the Human Development Index (HDI), **has experienced an upward trend throughout the last decade, significantly increasing in almost all countries. Major gaps between the northern and southern/eastern shores of the Mediterranean persist but have reduced**[8]. In 2017, HDI was highest in Israel, France, Slovenia, Spain and Italy (in decreasing order all ranking between world rank 22 and 28), moderate in Egypt and lowest in Syria (world rank 155). The largest progress has been experienced in Albania, Algeria, Bosnia and Herzegovina and Turkey, with major increases in life expectancy in Algeria and Turkey, and high increases of gross national income in Albania, Bosnia and Herzegovina and Turkey. In Libya, HDI went down as a result of the breakdown of the economy, while HDI in Syria collapsed due to severe degradation of all three components of HDI: life expectancy, duration of schooling and per capita national income.

14. **Basic education has considerably improved throughout the last decade, especially in SEMC** with literacy rates showing drastic increases, notably in Morocco, Tunisia and Turkey. Very significant progress in primary education has been observed between 2000 and 2016 in SEMC. However, access to tertiary education remains unequal.

15. **Girls' education has improved but the share of women in the active population is still low**. The gender parity index of the enrolment rate in primary and secondary schools increased in most Mediterranean countries. Nevertheless, the share of woman in the labour force in NMC and Israel was above 33% and below 33% in SEMC in 2017, having only slightly increased in almost all countries over the last decade[9]..

16. **The Mediterranean region is a global hotspot for migrations. This issue is *inter alia* linked to environmental pressures, and significantly impacts human development**. Turkey hosts the highest number of refugees worldwide, estimated at 3.54 million people, and counts more than 300 thousand asylum seekers. Lebanon hosts the highest proportion of refugees in the world (16.4% of total population)[10]. This proportion is 4.3% in Turkey, followed by Malta (1.7%). Meeting basic human needs of incoming migrants necessitates a flexible and effective response in host countries. Access to water, food and sanitary services, as well as waste management, are of specific concern in refugee camp operationalisation. Syria is the country from which the highest number of refugees originates in the world, with an estimated 34.5% of its population having left the country. An unprecedented peak in the number of refugees and migrants entered Europe via Western (Spain), Central (Italy) and Eastern (Greece) Mediterranean routes in 2015; with more than 1 million arrivals that year, compared to around 370,000 in 2016, 185,000 in 2017 and 140,000 in 2018[11]. Major places of origin include Syria, Palestine, Maghreb countries, as well as sub-Saharan African countries. In European Mediterranean countries, immigration flows range from 8,400 new international migrants

[8] UNDP (2018), Human Development databank
[9] ILO (2019), ILOSTAT
[10] UNHCR (2017), Migration Data Portal
[11] UNHCR (2019), Operational Portal Refugee Situations

per year in Malta to 332,600 in France[12]. This inflow of migrants has led to dialogue between countries and institutional capacity challenges[13]. Among others, environmental and climatic changes can be important drivers of migration, especially for water-scarce countries, in vulnerable areas e.g. rainfed farmland, water-contaminated sites, and urban slums.

17. Mediterranean high-income countries generate significant socio-economic and environmental spillover effects exporting a significant amount of pollution, waste and other negative externalities, thus limiting other countries' ability to achieve sustainable development[14]. Critical issues affecting in particular lower income countries include: international demand for palm oil and other commodities which fuel tropical deforestation, tax havens leading to difficulties to raise public revenues to finance SDGs, tolerance for poor labor standards in international supply chains, etc.

Main Fact 3 - Macroeconomic situation: Mediterranean countries are increasingly vulnerable to external conditions and shocks, including environmental shocks

18. **Mediterranean countries are vulnerable to external conditions and shocks.** Especially in SEMC, non-diversified economic structures, coupled with a general trade deficit (external balance) and budget deficit, reflect and reinforce the difficulty of national economies to develop more competitive products that could enhance economic resilience[15].

19. **Cooperation frameworks and integration schemes in Euro-Mediterranean relations have not achieved shared prosperity**. Political integration in the Mediterranean region has been limited throughout the last decade and mainly focused on thematic ministerial conferences and parliamentary meetings under the Union for the Mediterranean and the Parliamentary Assembly of the Mediterranean, as well as some cooperation on security-related matters. Economic integration has been less timid with tariff dismantling under free trade agreements already in force and the signature of a number of additional trade agreements, mainly between the EU and accession candidates, remaining however relatively limited in comparison to other regions in the world. Little progress has been achieved in the dismantling of non-tariff barriers to trade, in particular subsidies which are still common across the region, including subsidies considered environmentally damaging[16]. Trade among EU and Mediterranean countries did not increase much faster than trade of EU countries with the rest of the world, with the share of intra-Mediterranean imports remaining stable and exports from EU to other Mediterranean countries slightly increasing between 2005 and 2015, meaning that trade regionalization remained low in the Mediterranean region[17].

20. **Youth unemployment is a critical issue in most of the basin**. Total unemployment rates differ broadly from 4% of total labour force (Israel and Malta) to 21% (Bosnia and Herzegovina)[18]. Youth (age 15-24) unemployment shows rates of up to three times the national unemployment level[19], with especially high proportions of youth not in education, employment or training – an indicator that excludes students from the youth unemployment rate – in Albania, Algeria, Bosnia and Herzegovina, Egypt, Lebanon, Palestine, Tunisia and Turkey (> 20%) and exceeds 15% in Italy (19%) and Montenegro (16%)[20]. The creation of new jobs, especially for young people, is becoming a cross-cutting priority concern for Mediterranean policy makers. The emergence of innovative sectors within

[12] UN DESA (2013), Migration Data Portal
[13] Werz and Hoffman, 2017 Climate change and Migration in the Mediterranean, IEMED
[14] Sachs, et al. (2019), Sustainable Development Report 2019. New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN)
[15] Salman et al. (2018), External and internal imbalances in South Mediterranean countries, FEMISE Research Paper 42-13
[16] OECD/IEA (2019), "Update on recent progress in reform of inefficient fossil-fuel subsidies that encourage wasteful consumption"
[17] Ayadi et al. (2017), Regional Integration in the Euro-Mediterranean, EMNES Working Paper N°1 2017
[18] World Bank (2019), World Development Indicators Database extraction
[19] ILO (2019), ILOSTAT
[20] ILO (2018), ILOSTAT; data missing for Libya, Morocco and Syria

the green, blue and circular economy could contribute to the creation of these needed jobs[21], and proposal for an environmental transition in economic or housing sectors is examined in light of employment concerns.

21. **Throughout the last twenty years, agriculture and industry have lost ground while services developed**[22]. In Mediterranean countries, services generally account for close to or above half of national GDP with Albania (47%) and Algeria (46%) having the lowest service share and Malta (75%), Cyprus (74%) and Lebanon (74%) the highest. In only three Mediterranean countries, industry represents around or more than 30% of national value added: Algeria (with an economy highly dependent on oil and gas), Egypt (the only Mediterranean country having recently experienced a significant increase in the contribution of industry to GDP) and Turkey. Israel (19%) and Lebanon (12%) have the lowest contribution of industry to their national economies. The share of agriculture in national GDP is generally below 10%, except for five countries: Albania (19%), Algeria (12%), Morocco (12%), Egypt (11%), and Tunisia (10%). Algeria is the only Mediterranean country in which the share of the agricultural sector is increasing (from 8% in 1990 to 12% in 2017). The informal sector, which has a significant weight in many Mediterranean countries, is not accounted for in the mentioned statistics.

22. **Mediterranean economies increasingly rely on debt**. Over the last decade, government debt, as a percentage of national GDP has increased in most Mediterranean countries, except for Israel, Lebanon, Malta, and Turkey. The government debt over GDP ratio is close to or above 60% in all Mediterranean countries except for Algeria, Bosnia and Herzegovina and Turkey, and is close to or above 100% in Cyprus, Egypt, France, Greece, Italy, Lebanon and Spain, with Greece reaching more than 180%[23]. High and increasing debt ratios can be a risk for the financial sustainability of Mediterranean governments, and hinder public investments in the environment sector.

23. **The Mediterranean basin is unable to produce enough agricultural and food products for its own consumption and is therefore highly dependent on international trade and imports of agricultural products, and sensitive to the volatility of international prices**. The agricultural production deficit is due, on the one hand, to agroclimatic conditions, and on the other hand to the scarcity of arable land and water resources. It is also linked to low water efficiency and land productivity in some parts of the Mediterranean basin, and to a significant amount of food waste. Faced with a growing demand for food products, especially cereals, food security is increasingly threatened in countries where population growth, changes in lifestyle and eating habits and therefore demand are sustained. Mediterranean countries account for one-third of world imports of cereals, especially wheat, for only 7% of the world population. Egypt and Algeria are among the largest cereal importers in the world, and the import dependency ratio for cereals (import / consumption ratio) is very high in the Mediterranean (42% in Egypt, 60% in Tunisia, 72% in Algeria, 86% in Lebanon). The only countries whose agricultural balance is in surplus are France and Spain. The contribution of small-scale family farming to food security should not be underestimated. Small scale crop and livestock production in family farms significantly contribute to the food consumption of farmers and their families, and to the provision of food adapted to local tastes, including for urban dwellers.

Main Fact 4 - Good environmental status: Mediterranean economies are dependent on environmental integrity, in particular in coastal areas

24. **Mediterranean countries, communities and economies are dependent on natural coastal and maritime resources to create wealth, provide jobs, and continue to develop locally**. It is therefore essential to recognize the importance of environmental sustainability to address key socio-economic challenges in Mediterranean countries.

25. **Mediterranean countries remain the world's leading tourism destination** with nearly 30% of international tourist arrivals, and absolute numbers having doubled in 20 years. Recently, this

[21] According to ILO, the green economy would provide jobs to 24 million people in the world, before 2030
[22] World Bank (2019), World Development Indicators Database extraction
[23] IMF (2016), Database extraction

growth has been concentrated in northern countries, with international arrivals diminishing since 2011 in SEMC. **The coastal and maritime tourism sector is extensively developed in NMC and had witnessed a significant growth in SEMC, before the 2011 slow-down turn.** International tourist arrivals in the Mediterranean region grew from 58 million in 1970 to more than 337 million in 2016 and are projected to reach 500 million by 2030[24]. Tourism provides around 11% of total Mediterranean countries employment and 11% of their GDP[25], directly and indirectly.

26. **The Mediterranean also stands as the second biggest cruising region in the world** (16.7% of global cruise fleet deployment in 2018), after the Caribbean). In 2018, the Mediterranean noted more than 28 million cruise passenger movements, compared to just over 8.5 million in 2000 and port infrastructure for cruising is continuously developing to accommodate this rapid growth.

27. **Mediterranean fisheries and aquaculture play a strong role in the economy**[26]. Mediterranean fishing generates 227,000 jobs and a direct and indirect economic impact of approximately 6.35 billion USD annually[27]. Aquaculture accounts for more than 50% of total fish production and plays an important role in coastal communities, contributing to socio-economic development and employment (more than 120,000 direct jobs and 750,000 indirect jobs)[28].

28. **Mediterranean agriculture's role in national wealth creation and employment varies across countries**. Agriculture provides between 1.5% (France) and 19% (Albania) of national GDP in Mediterranean countries and between 1% (Israel) and 40% (Albania) of national employment, with a general decreasing trend in the share of GDP and employment (except for Greece, Libya and Syria where agricultural employment has increased relatively in recent years).

29. **Marine biotechnologies and bioprospecting with applications in medicine, food, materials, energy and cosmetics are innovative and growing sectors in the Mediterranean region**. The high rate of endemism and quantity of species with high potential for application (e.g. sponges and extreme microorganisms) make the Mediterranean a promising region for these activities, with a significant potential for the generation of revenue and (highly qualified) jobs.

Main Fact 5 - Environmental pressures from economic sectors: Despite the emergence of low impact solutions, economic sectors exert increasing pressures on the environment, driven by a rapid growth in polluting sectors and a diversification of economic activities in marine areas

30. **The Mediterranean region has one of the world's highest ecological deficits**. The Mediterranean Ecological Footprint[29] per capita (3.2 gha[30]/cap) is higher than global average (2.8 gha/cap), while the biocapacity per capita to support this footprint is lower than global average in most Mediterranean countries (except for France, Croatia, Montenegro and Slovenia). The ecological footprint exceeds biocapacity in all Mediterranean countries, leading to an ecological deficit. From 2010 to 2014, the Ecological Footprint per capita decreased in most Mediterranean countries[31]. This is mostly due to the effects of the economic crisis, which slowed down resource consumption, a

[24] World Tourism Organization (2018), UNWTO Tourism Highlights, 2018 Edition, UNWTO, Madrid
[25] WTTC (2015). *Economic impact of Travel and Tourism in the Mediterranean*
[26] Piante et al. (2015), Méditerranée : La croissance bleue face au défi du Bon État Écologique - Résumé. Projet MedTrends. WWF-France
[27] Based on FAO (2018), The State of Mediterranean and Black Sea Fisheries. General Fisheries Commission for the Mediterranean. Rome. 172 pp. Licence: CC BY-NC-SA 3.0 IGO
[28] Piante et al. (2015), Méditerranée : La croissance bleue face au défi du Bon État Écologique - Résumé. Projet MedTrends. WWF-France
[29] The Ecological Footprint measures how much biocapacity humans demand, and how much is available and 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.
[30] Global hectares (gha) is a unit of world-average bioproductive area, in which Ecological Footprint and biocapacity are expressed
[31] Global Footprint network (2019), online database

reduction of CO_2 emissions in NMC and population growth in SEMC spreading the total footprint over a larger population. Variations in the ecological footprint continue to be coupled to variations in GDP, noting, however, a slower growth rate of ecological footprint compared to GDP.

31. **Citizens in Mediterranean EU countries seem to have a higher concern than the EU average about the impact of environmental issues on their everyday lives and of chemicals and plastics used in everyday products on their health and on the environment.** In absence of a comprehensive study on environmental attitudes and behavior of Mediterranean citizens, an EU-wide survey provides some elements on attitudes towards the environment in Mediterranean EU countries[32]. Air pollution is considered as the most important environmental issue, followed by climate change and the increasing amount of waste. Citizens in Mediterranean EU countries are a majority and more numerous than the EU average to say that they perceive that air quality has deteriorated over the last 10 years. When asked about effective ways to tackle environmental problems, EU citizens give strong support to environmental legislation (higher fines for breaches, stronger enforcement and more stringent legislation), along with more investment in research and development for technological solutions. They are also a majority to say that action taken to protect the environment is insufficient at all levels.

32. **While being economically profitable in the short term, coastal mass tourism generates considerable environmental damage** (habitat loss, increase of water consumption and waste production, disturbance of protected and endangered species mainly due to underwater noise, water pollution, introduction of invasive species, etc.). In addition, profits are not necessarily invested in local development. Tourism in Mediterranean countries faces three complementary challenges: to sustain and expand the development of an alternative offer to mass tourism, less seasonal, more environmentally sustainable and socially beneficial, based on rural and cultural assets (including ecotourism) to enhance the sector's resilience, among others, to climate change; to concomitantly reduce the footprint of mass tourism, its pressure on scarce natural resources, fragile ecosystems and costly environmental infrastructure; and finally to strengthen tourism linkages with other sectors in the local economy generating indirect benefits on local employment while potentially driving demand for sustainable products.

33. **Transport is the highest energy consuming sector** (with 31% of total energy consumption in NMC and 38% in SEMC) **and, with a very strong dependence on fossil fuels, among the largest contributors to GHG emissions in the Mediterranean region**. GHG emissions in the region are mainly caused by terrestrial traffic, and in a smaller proportion maritime and air traffic. Road transport accounts for 70% of transport energy use in the Mediterranean basin, mainly stemming from private vehicles. Transport also leads to significant air pollution, particularly in cities, and represents a major challenge for human health.

34. **The Mediterranean Sea is host to the world's busiest shipping lanes**, accommodating large parts of the world fleet which pass through the Suez Canal, the Bosporus and Dardanelles and the Gibraltar straits, connecting Asia with Western Europe ports and serving the growing ports in the Mediterranean and Black Sea regions and connecting them with other continents. The Suez Canal/SUMED Pipeline and the Turkish Straits accounted for over 13% of the world's seaborne oil trade in 2015 and the Mediterranean coastal States' fleet accounts for more than 17% of the world's oil tanker capacity in 2017. Pressures from maritime transport essentially include emissions of air pollutants with particularly high pressures on port cities, potential accidental (with a clear downward trend) and illicit discharges of oil and hazardous and noxious substances (remaining issue); marine litter; water discharge, including ballast water, and hull fouling (shipping being the primary source of the over 1000 established non-indigenous species in the Mediterranean); air emissions from ships (gases and particulates like sulphur oxides (SOx) and nitrogen oxides (NOx) which are toxic for

[32] TNS political & social at the request of the European Commission, Directorate-General for Environment (2017), Special Eurobarometer 468 - October 2017 "Attitudes of European citizens towards the environment"

humans, and GHG); underwater noise; collisions with marine mammals; land take through port infrastructure; and anchoring (destructive for sea floor ecosystems).

35. **The Mediterranean continues to rely on energy imports and fossil fuels, despite improvements in renewable energy production**. Mediterranean countries account for 7% of the world primary energy demand in 2015 (equivalent to its global population share), representing more than 955 million tons of oil equivalent (Mtoe). Primary energy demand has increased by 38% between 1990 and 2015, despite a relative stagnation between 2008 and 2015. NMC account for nearly two thirds of total Mediterranean energy demand, while the southern and eastern Mediterranean countries consume about 19% and 18% respectively. In 2040, energy demand of SEMC are projected to exceed that of the NMC. Total energy production has been increasing since 1990, reaching 549 Mtoe in 2015, well below the region's energy demand. Electricity demand almost doubled between 1990 and 2015. Renewable non-hydro electricity production has increased from 1% of total production in 1990 to 11% in 2015. The 2015 electricity generation mix also includes: 29% gas, 25% nuclear (of which 87% in France), 16% coal, 13% hydro, and 7% oil[33]. There is an enormous but untapped potential for further increase of renewable energy sources (wind and solar), especially in Southern Mediterranean countries, which can contribute to ensure a cleaner energy sector and reduce energy dependence (the region is currently importing around 58% of its fossil fuel demand with 90% in NMC and 20% in SEMC). There is also a high potential for further energy savings and energy efficiency.

36. **More than two hundred offshore oil and gas platforms are active in the Mediterranean**. With new discoveries of large fossil fuel reserves and explorations in the region, this figure is set to increase. Ongoing offshore exploration in the Levantine Basin, in Lebanon and Syria, as well as in the Nile Delta Basin and Aegean Basin could contain significant reserves of oil and gas and could transform the eastern Mediterranean ecosystems and economies.

37. **Quantities of fertilizers and pesticides used for agriculture in Mediterranean countries are above global average**. The average per hectare fertilizer consumption is of 176 kg in NMC, and of 185 kg in SEMC, compared to the global average of 138 kg[34] in 2015. The average consumption of pesticides in the Mediterranean basin in 2015 was 6.7 kg per hectare, compared to the world average of 2.12 kg. France, Italy, Spain and Turkey are the Mediterranean countries using or selling the highest amount of pesticides for the agricultural sector in 2016[35].

38. **Large water footprints per capita are found throughout the Mediterranean exceeding the global average**[36], with especially high volumes of water contained in imported goods and services. SEMC are more dependent on these virtual water imports (e.g. Egypt, Israel, Syria). The use of water within the national consumption and production systems of Mediterranean countries shows a water deficit (higher abstracted quantities of water than available renewable water resources) in all SEMC. Desalination develops in a context of water scarcity, making the Mediterranean one of the most active regions of desalination activity in the world. Despite technological improvement, desalination plant rejections remain an environmental concern for coastal ecosystems, as these plants are generally associated with the rejection of high concentration waste brine from the plant and pretreatment units as well as from cleaning operations. These pollutants increase seawater temperature, salinity, water current and turbidity, and cause fish migration[37].

[33] OME (2018), OME database
[34] World Bank (2019), World Development Indicators Database
[35] FAO (2016), FAOSTAT database
[36] Mekonnen, M.M. and Hoekstra, A.Y. (2011) National water footprint accounts: the green, blue and grey water footprint of production and consumption, Value of Water Research Report Series No. 50, UNESCO-IHE, Delft, the Netherlands
[37] Al-Mutaz, 1991, Research paper: Environmental impact of seawater desalination plants - Environ Monit Assess. 1991 Jan;16(1):75-84. doi: 10.1007/BF00399594

III. State and impact

Main Fact 6 - Land-cover and land-use change: Ambitious objectives and disparate policy measures have not been sufficient to preserve natural land cover and agricultural land use, particularly in coastal areas

39. **Land cover and land use in the Mediterranean region continue to change as a result of human activities, with urban sprawl** (residential, touristic, commercial and industrial area expansion) **and infrastructures diffusing throughout the region. Landscapes are typically fragmented due to a multitude of human land uses**, and ecological continuity is a constraint for many biodiversity components.

40. **Soil is one of the main contributors to agroecosystem function and food security. In the Mediterranean region, around 8.3 million hectares of arable land have been lost since 1960**[38] and the area of arable land decreased by an average of 13% over the period 1995-2015, ranging from a loss of 42% of arable land in Palestine to an increase of 21% in Bosnia and Herzegovina. The area of arable land per capita fell by an average of 41% over the same period, more than double than average in middle-income countries globally. The Mediterranean States most affected by the decline in ha per capita are Palestine (-68%) and Lebanon (-62%). Soil degradation is mainly caused by agricultural and non-agricultural land use intensification, resulting from the expansion of intensive cultivation techniques, industrial and urban areas and leading mainly to water and wind erosion, salinization, sealing and compaction, loss of organic matter and permanent loss of vegetation cover, impacting biodiversity and ecosystem services.

41. **Within the limit of the Mediterranean biome, the extent of forests has remained stable, with contrasts between northern and southern shores**. In NMC, land abandonment in rural areas, associated to depopulation, has led to natural recovery and forest expansion. In SEMC, pressures on agricultural and forest ecosystems remain significant due to strong demographic pressures on land and water resources, urban sprawl, forest overexploitation, and overgrazing.[39] Although the forest area of Mediterranean countries at national scale has increased from 68 million ha in 1990 to 82 million ha in 2015[40], forests in the Mediterranean biome cover 18% of total area and remain stable. Mediterranean forests are subject to fragmentation due to land cover change including urban sprawl and infrastructure expansion. The area of other wooded lands (small trees, shrubs and bushes) has decreased from 36 million ha in 1990 to 32 million ha in 2015. The coverage of trees outside forests (found in agroforestry systems, urban forests and as elements of the landscape) has increased between 2000 and 2010[41]. Climate change-induced longer droughts and heat waves, combined with uncontrolled biomass accumulation due to land abandonment in northern countries, are leading to an increased risk of wild fires.

42. **Areas of coastal wetlands continue decreasing**. The Mediterranean basin hosts 19-26 million hectares of wetlands[42], and according to a broad sample of 400 Mediterranean wetland sites, about 48% of natural wetland habitats have been lost between 1970 and 2013. The surface area of natural coastal wetlands such as wet meadows and marshes has decreased by more than 10% over the past decades, whereas artificial wetlands like pools, reservoirs and storage ponds have increased by more than 50%[43], the latter being designed mainly for agricultural and aquaculture purposes.

43. **In the coastal belt, the built-up area has increased substantially in the last decades, leaving less space for natural coastal ecosystems and increasing risks for people living in the coastal zone**. Between 1975 and 2015, three out of four Mediterranean countries doubled or more

[38] Zdruli P. (2014), Land resources of the Mediterranean: status, pressures, trends and impacts on future regional development. Land Degrad Develop 25: 373–384
[39] FAO and Plan Bleu (2018), State of Mediterranean Forests 2018
[40] FAO (2015), Global Forest Resources Assessment programme
[41] FAO and Plan Bleu (2018), State of Mediterranean Forests 2018
[42] Mediterranean Wetland Observatory, 2018
[43] Tour du Valat and MedWet (2014), MWO LAND COVER REPORT 2014

than doubled the built-up area in the belt situated within 1 km from the coastline. Urban expansion and industrialization around coastal cities are driven by waterfront development for economic activities, such as tourism and real estate, marinas, fishing and trading ports, industrial plants that need the proximity of seawater for cooling or for production export (energy, mineral), desalination, etc., with diverse environmental and social impacts. The ICZM Protocol, in its article 8, provides that Contracting Parties shall establish in coastal zones, a zone of at least 100 m in width where construction is prohibited. However, the built-up area within the first 150 m wide belt along the coastline is above 20% in almost half of Mediterranean countries in 2015[44], noting that much of the built-up area is a legacy dating back prior to the entry into force of the ICZM Protocol in 2011. The past and ongoing development of harbors, dikes and others coastal structures is further declining the extent of rocky shores and cliffs, which have decreased by approximatively 20% over the last 50 years in EU countries, as well as beaches. Land-use change and subsequent fragmentation represent a major driver of the loss of biodiversity and ecosystem services in the Mediterranean Basin to date[45].

Main Fact 7 - Ecosystem services and cumulated impacts: Multiple human induced pressures combine to threaten critical resources, biodiversity components and ecosystem services

44. **Mediterranean coastal terrestrial ecosystems offer important services to the inhabitants of the basin; but their functioning is threatened by past and current land-use mismanagement**. Ecosystem services offered by wetland and coastal aquifers include water purification, flood and drought mitigation, and water provision, among others. Services offered by these ecosystems are much more significant than their relative land surface. However, loss of natural wetlands habitats and excessive abstraction of groundwater limits the capacity of these ecosystems to provide services. Soft and rocky shores (e.g. beaches, cliffs), representing the majority of the Mediterranean coastline[46], offer services like natural sea defence, nutrient cycling and erosion control and provide opportunities for tourism. Coastal infrastructure development, water and sediment flow alteration at the watershed scale, and pollution, alter the functioning of these ecosystems and their services. Agroecosystems, forests and shrublands, as well as their ecosystem services (e.g. food, fuel and fibre production), are mainly impacted by landscape fragmentation.

45. **The region is a hotspot for marine biodiversity and endemism, which are fragile and threatened by species extinctions and habitat losses**. Although the Mediterranean Sea is a low primary productivity ecosystem due to limited nutrient inputs from fluvial and Atlantic origins, and despite only covering 0.82% of the world's ocean surface, it hosts more than 17,000 marine species and contributes to an estimated 4-18% of the world´s known marine species. The Mediterranean Sea represents the highest proportion of threatened marine habitats in Europe (32%) with 21% being listed as vulnerable and 11% as endangered, with seagrass ecosystems experiencing the most rapid recession. Marine ecosystems support fish stocks restoration, resilience to climate change, sailing, diving and wildlife-watching activities, for example. Fishing and harvesting aquatic resources, considering overfishing, bycatch and the damaging impacts on marine habitats, is the main driver of increasing fish species extinction risk in the Mediterranean region[47]. Over the 1950 to 2011 time-period, the abundance of top predators including a number of marine mammals has diminished by 41% and fish species have reduced by 34%, including commercial and non-commercial species, while an increase of about 23% of the organisms at the bottom of the food web has been observed[48].

46. **Seagrass meadows occurring in the Mediterranean, including the endemic species *Posidonia oceanica,* play an important role in terms of habitat for biodiversity, water quality**

[44] UNEP GRID Geneva (2017), Evolution of the built-up area in coastal zones of Mediterranean countries between 1975 and 2015. PAP/RAC
[45] IUCN (2018), The IUCN Red List of Threatened Species. Version 2018-2
[46] Furlani et al. 2014, The rock coast of the Mediterranean and Black Seas, Geological Society London Memoirs 40(1):89-122
[47] IUCN (2018), The IUCN Red List of Threatened Species. Version 2018-2
[48] Piroddi et al. (2017), Historical changes of the Mediterranean Sea ecosystem: modelling the role and impact of primary productivity and fisheries changes over time, Scientific Reports 7

regulation, coastal protection and carbon fixation and storage. Localized regressions have been recorded in the region, in relation to natural and anthropic pressures such as mooring, seabed disturbing fishing, and excessive sand and organic matter discharge.

47. **Coralligenous assemblages contribute to climate change resilience and generate a remarkable natural productivity** which contributes to the maintenance and development of fisheries resources. Numerous species (above 1,700 species, i.e. 15 to 20% of Mediterranean species) use coralligenous environments as feeding, breeding or nursery grounds, including species of commercial interest for fisheries and endangered or threatened species. Furthermore, being attractive for scuba diving, coralligenous assemblages support important recreational economic activities whose existence depends on the presence and the state of conservation of these assemblages.

48. **78% of Mediterranean and Black Sea fish stocks are fished at biologically unsustainable levels**[49]. Fish landings in the Mediterranean have been declining irregularly since 1994 with subsequent decline in economic value, and represented 850 000 tonnes in 2016. The number of overexploited or collapsed fish stocks in the Mediterranean Sea has increased between 1970 and 2010[50]. The pattern of exploitation and the state of different fish stocks is especially critical in the eastern Mediterranean. Fishery overexploitation is the main driver of marine populations and has led to the bad state of most highly commercial stocks and the low abundance of top predators.

49. **The Mediterranean Sea and particularly the Levantine basin are hotspots for alien species introductions some of which causing a decrease or collapse in native species populations**. More than 1,000 non-indigenous marine species have been recorded in the Mediterranean, of which 618 are established[51]. Among the many important pathways by which human actions have introduced alien invasive species into the Mediterranean Sea are shipping (by means of ballast waters and hull fouling), corridors, maritime transport and water ways, aquaculture, trade in live marine organisms (aquarium trade and fishing bait) and others (e.g. fishing activities and aquarium exhibits). Mediterranean Sea warming leads to spreading of some “warm-water” invaders and reduction of some indigenous species. There is evidence that some invaders have already had a strong ecological impact on marine ecosystems, communities and activities, while others are becoming commercially exploited fishing resources.

50. **Water scarcity is considered one of the main factors challenging sustainable development, especially in SEMC and island states**. Total renewable water resources are unevenly distributed across the basin, with 67% in the northern sub-region, 23% in the eastern sub-region and 10% in southern countries[52]. Around 30% of the Mediterranean population live in water scarce countries[53], and an additional 13% in countries facing absolute water scarcity[54]. With less than 500 m^3 total renewable water resources per capita per year, Algeria, Israel, Libya, Malta, Palestine and Tunisia face important water-related challenges. On the contrary, northern countries are in a situation of relative water security (> 1,700 m^3 per inhabitant per year). However, national averages hide significant local and seasonal disparities, and natural water scarcity in the Mediterranean region is getting aggravated, even in the North, by population growth, urbanization, growing food and energy demands, pollution and climate change.

51. **Significant differences in the proportion of water demands exist between Mediterranean catchments with high seasonal variations. By 2050, under a business-as-usual water-use**

[49] FAO (2018), The State of Mediterranean and Black Sea Fisheries
[50] Tsikliras et al. (2015), The Mediterranean and Black Sea Fisheries at Risk from Overexploitation, doi:10.1371/journal.pone.0121188
[51] MedQSR, UNEP/MAP, Athens, 2017
[52] FAO (2016), AQUASTAT
[53] TRWR per capita < 1000 m3/inhab/year but > 500 m3/inhab/year, Source: Plan Bleu calculations based on data from AQUASTAT, FAO, 2014
[54] TRWR per capita < 500 m3/inhab/year, Source: Plan Bleu calculations based on data from AQUASTAT, FAO, 2014

scenario, water withdrawals are projected to double or even triple in catchments of the southern and eastern rims due to population growth, expansion of irrigated areas and increasing crop water needs resulting from warmer and drier conditions[55]. Water demand for irrigation purposes represents more than half of the total water demand over all Mediterranean catchments (for the production of cereals, vegetables and citrus), except in France and Italy where water demands for energy and industrial purposes prevail, and in Slovenia and Croatia where domestic water demands prevail[56]. Water demands vary throughout the year, mainly in correlation with agriculture and tourism. Environmental requirements (environmental flows) which are necessary for sustaining ecological continuity, riparian productivity and many other services provided by fluvial systems, are often underestimated, neglected and strongly impacted by over-abstraction.

52. **The Mediterranean contribution to global CO_2 emission reduction objectives remains insufficient**. While the CO_2 emissions of NMC have peaked in 2005 and decreased since then, those of most SEMC continued to increase, in particular due to demographic growth. Total CO_2 emissions from Mediterranean countries account for 5% of world emission estimates. Total CO_2 emissions in Mediterranean countries have remained stable between 2000 and 2014[57], the increase of emissions in SEMC being close to levelled out by the decrease of emissions in NMC. NMC and SEMC now both emit about 1 Giga ton of CO_2 per year[58]. Emissions per inhabitant stand around 4 tonnes per capita on average, remaining highly differentiated among countries (ranging from 0.5 to 10 tonnes per capita). Mediterranean countries with highest total CO_2 emissions (higher than 100 kt in 2014) include Turkey, Italy, France, Spain, Greece and Algeria (in decreasing order). Total CO_2 emissions have decreased between 2000 and 2014 in Croatia, Cyprus, Greece, France, Italy, Slovenia, and Spain (Northern countries) and Syria, and have increased in Israel, Lebanon, Turkey (East), Algeria, Egypt, Libya, Morocco, Tunisia (South), and Bosnia and Herzegovina (North). At the global level, the IPCC indicates that a decline in CO_2 emissions by about 45% from 2010 levels by 2030 would be needed to be compatible with a 1.5°C warming scenario[59].

53. **Nutrients, heavy metals, persistent organic pollutants (POPs), pesticides, hydrocarbons, and marine litter are the main pollutants of the Mediterranean Sea and efforts have so far not succeeded in achieving GES of the waters in many places**. Levels of major pollutants show a decreasing trend, even though important issues remain, especially for heavy metals in coastal sediments, as well as in known hotspots associated with urban and industrial coastal areas. A decreasing trend has been observed for aqueous effluents from specific industrial sectors, such as the food and beverages, metals production and processing, and paper and wood production, while increasing trends have been observed for waste and wastewater management and the energy and chemical sectors[60]. Emerging pollutants, such as plastic additives, cosmetics, plasticizers, nanoparticles, and pharmaceuticals, represent an under-investigated threat to ecosystem and human health which deserves attention, especially because, to date, municipal treatment plants are unable to remove them. Underwater noise is also an issue of raising concern for its major impacts on cetaceans, especially in relation to identified hotspots overlapping important habitats of cetaceans such as the Pelagos Sanctuary and the Strait of Sicily. At the European level, considering the 16 River Basin Districts monitored in terms of surface water pollution and habitat degradation along the

[55] Milano et al. (2012), Facing climatic and anthropogenic changes in the Mediterranean basin: What will be the medium-term impact on water stress?, doi:10.1016/j.crte.2012.07.006
[56] Margat & Treyer (2004), L'eau des Méditerranéens : situation et perspectives. No. 158 de la Série des rapports techniques du PAM, PNUE/PAM, Athènes, 2004.; Milano et al. (2012), Facing climatic and anthropogenic changes in the Mediterranean basin: What will be the medium-term impact on water stress?, doi:10.1016/j.crte.2012.07.006
[57] World Bank (2019), World Development Indicators Database extraction
[58] Carbon Dioxide Information Analysis Center (2019), U.S. Department of Energy Berkeley Lab
[59] IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways
[60] NBB 2003, 2008 and 2013 and E-PRTR 2013

Mediterranean coastline, 49% of water bodies on average are failing to achieve the Good Ecological status, the highest percentage being found in Sicily, Italy, and lowest in Corsica, France[61]. Eutrophication represents a major issue in coastal areas influenced by natural and anthropogenic inputs of nutrients, such as the Gulfs of Lion and Gabès, the Adriatic Sea, northern Aegean, and Nile-Levantine. The exploration and exploitation of recently discovered large offshore gas fields have increased environmental, health and safety risks, in particular in the Levantine basin.

54. **Waste generation and management practices vary widely throughout the Mediterranean**. The total amount of generated municipal solid waste is slightly greater than 183 million of tons per year, i.e. an average of 370 kg per capita per year (about 1 kg per capita per day). In NMC, values range from 1.1 to 1.7 kg per capita per day with a maximum of more than 3 kg in Monaco. In SEMC, values range from 0.5 kg per capita per day in Morocco to 1.1 in Algeria (value for Israel is similar to EU countries). In NMC and Israel, the percentage of food and organic waste is between 30% and 52% while this rate in the SEMC is still higher (from 52% in Lebanon to 70% in Libya). Recycling rates also vary broadly. In the northern countries, the recycling rate is above 13% and reaches 46% in Slovenia (except in Bosnia and Herzegovina with almost no recycling). In the southern shore, Egypt has the highest recycling rate (12.5%) and the rate is especially low in Palestine, Syria and Turkey. A relatively high share of waste is discharged on open dumpsites or unaccounted for, representing potential leakage into the environment and eventually ending up as marine litter.

55. **The Mediterranean is one of the world areas most highly affected by marine litter due to an increase in plastic use, the lack of recycling, unsustainable consumption patterns, inadequate and ineffective waste management, high pressures from tourism and shipping, coupled with significant riverine inputs**. Marine litter negatively impacts marine resources including wildlife and ocean integrity. Plastics account for up to 95 to 100% of total floating marine litter and more than 50% of seabed marine litter[62]. The Mediterranean is especially affected by microplastics, with concentrations at the sea surface largely above 100,000 items per km^2 [63] and maxima above 64 million floating particles per km^2 [64]. These concentrations are projected to further increase in years to come. Marine Litter impacts marine organisms mainly through entanglement and ingestion, but also through colonization and rafting. It also creates an economic burden through clean-up costs, and potential loss of income and jobs from tourism, residential property values, recreational activities and fisheries. The effects of micro- and nano-plastics and associated Persistent Organic Pollutants (POPs) and Endocrine Disrupting Chemicals (EDCs) in the marine environment represent an additional risk to human health and marine organisms.

56. **Although land-based sources are dominant in generating marine litter, sea-based sources actively contribute to the problem with an estimated EU average of 32% and values up to 50% for some sea basins**. It is estimated that the fishing and recreational sectors are relatively large sea-based sources contributors, with shares of 30% and 19% respectively (the balance provided by merchant shipping). If an average treatment of 25% is assumed, the gross waste generation would be an approximate 1.2 million tons per year for all shipping sectors in the EU. Fishing and recreational vessels together account for about half of the total MARPOL Annex V waste generation.

[61] European Environment Agency (2018), Dashboard, Ecological status of surface water bodies
[62] UNEP/MAP (2015), Marine Litter Assessment in the Mediterranean, Athens
[63] UNEP/MAP (2015), Marine Litter Assessment in the Mediterranean, Athens
[64] Van der Hal et al. (2017), Exceptionally high abundances of microplastics in the oligotrophic Israeli Mediterranean coastal waters. Mar Pollut Bull., 116(1-2):151-155. doi: 10.1016/j.marpolbul.2016.12.052

<u>Main Fact 8</u> – Human health: while health has globally improved in the region, pollutants, climate change, new lifestyles and consumption patterns raise increasing health concerns

57. **In the Mediterranean, 15% of deaths are attributed to modifiable environmental factors[65], compared to 23% worldwide**[66]. Among Mediterranean countries, the number of deaths attributed to modifiable environmental factors ranges between 8% and 27% in 2012[67]. WHO estimated that, in Mediterranean countries, more than 228,000 persons died prematurely in 2016 because of exposure to ambient air pollution, making it the main responsible for the environmental burden of disease in the region.

58. **Air pollution is critical, its negative impact on various health components being increasingly well documented**. Levels of urban ambient air pollution is best documented for particulate matter (PM2,5) and in Mediterranean countries are highest in Egypt (100.6 μg/m^3), far above world and European averages (39.6 μg/m^3 and 14.2 μg/m^3, respectively). Other Mediterranean countries with levels >40 μg/m^3 include Bosnia and Herzegovina and Libya[68]. In 2016, almost two thirds of Mediterranean countries exceeded the WHO threshold of 25 μg/m^3 of particulate matter (PM2,5).

59. **Contaminated drinking water affects human health**. In some areas, water is still contaminated by untreated sewage that leads to increased nitrite and bacteriological count. Drinking water sources are also affected by leakage of nitrates from extensive fertilizer use in agricultural activities leading to an increase in nitrate levels.

60. **Under 5-year old deaths attributed to environmental causes have been reduced in SEMC**. However, progress remains possible. In 2016, the burden of disease related to diarrhoeal diseases from water, hygiene and sanitation was above 30 000 disease adjusted life years (DALYs) in children under 5 years in Algeria, Egypt, Morocco and Syria.

61. **Climate change increases risks for human health**. Increased and longer heat waves are a health risk factor especially for the elderly. Transmission of vector-, food- and water-borne diseases is facilitated by higher temperatures. The risk of personal injury increases with a higher frequency and intensity of extreme weather events. Modifications in pollen patterns favour asthma and allergies. Finally, drinking water sources are at risk of loss, decreasing quality and salination through intrusion of saltwater, potentially causing a significant rise in cardiovascular diseases.

62. **Man-made and natural disasters and emergencies are a reality in the Mediterranean region and have the potential to temporarily or permanently alter the inhabitants' access to safe environmental infrastructure and services**. The Mediterranean is an area of relatively high seismic and volcanic activity with a series of destructive earthquakes, volcanic eruptions and tsunamis on record, having displaced and killed thousands of Mediterranean inhabitants. Man-made emergencies linked to political turbulence and war force large numbers of people to flee and find new, often improvised, housing and means of living. In such emergencies, providing healthy and safe environments for people is a particular challenge. Forced displacement can also cause environmental degradation, not only in the (destroyed) areas left behind, but also in the areas that receive massive population flows. Emergency and preparedness plans, integrating health and environment considerations are key to disaster management to protect the health and ecosystems.

[65] Modifiable environmental factors include pollution of air, water, or soil with chemical or biological agents; UV and ionizing radiation; noise, electromagnetic fields; occupational risks; built environments, including housing, land use patterns, roads; agricultural methods, irrigation schemes; man-made climate change, ecosystem change; behavior related to the availability of safe water and sanitation facilities, such as washing hands, and contaminating food with unsafe water or unclean hands.
[66] WHO (2012), Global Health Observatory
[67] WHO (2012), Global Health Observatory
[68] Mean annual concentration of fine suspended particles of less than 2.5 microns in diameters, Global Health Observatory data repository

63. **In many Mediterranean countries, a triple nutritional burden can be observed, adding undernutrition, overfeeding (obesity and noncommunicable diseases) and nutritional deficiencies**. A worrying increase in overweight and obesity is to be noted between 2012 and 2016 in all Mediterranean countries[69]. The adult obesity rate exceeds 30% in 2016 in Egypt, Lebanon, Libya, Malta and Turkey. It is lower in the Balkans but is everywhere above 20% (except in Bosnia and Herzegovina), leading to increased risks to public health (cardiovascular diseases, type 2 diabetes, metabolic syndrome).

64. **Degradation of coastal and marine ecosystems limit their benefits for humans**. Coastal and marine ecosystems provide a number of health benefits ranging from food provision, including the particularly healthy fatty acids contained in fish, to the provision of bioactive metabolites used in drugs, and the provision of leisure activities contributing to physical and mental health. The degradation of coastal and marine ecosystems negatively impacts their capacity to provide the mentioned ecosystem services and thus reduces human health benefits.

65. **Whereas environmental factors affect human health, the health sector itself influences the state of the environment**, producing a magnitude of different kinds of waste, including untreated pharmaceutical residues in wastewater that travel down water basins and end up in the marine environment, and potentially in the food chain. Liquid waste from healthcare facilities can contain radioactive elements, heavy metals and hazardous substances from laboratories, bacteria and pathogens, blood, etc. leading to environmental contamination and health hazards, if not properly and fully disposed of via specific processes. If discharged directly into municipal wastewater networks, liquid medical waste is likely to remain untreated because municipal wastewater treatment facilities are not geared to treat such waste.

Main Fact 9 – Climate change impact: Climate change is already affecting the Mediterranean, exacerbating preexisting challenges

66. **The Mediterranean basin is affected by climate change at a pace well above global average, in particular by more rapid warming of ambient air and sea surface in all seasons**. While global mean air temperature is now about 1.1 °C above pre-industrial values, the Mediterranean region approaches a warming of 1.6 °C. It is expected to warm by 2.2 °C between 2030 and 2052 when the global mean is expected to reach the 1.5 °C threshold highlighted in the Paris Agreement. Without additional mitigation, in some regions of the Mediterranean the temperature increase is expected to exceed 3.8 °C by 2100. In parallel, the sea surface temperature in the Mediterranean has already warmed by around 0.4 °C per decade during the period between 1985 and 2006 and is expected to reach between + 1.8 °C and + 3.5 °C by 2100 compared to the period between 1961 and 1990. Heat waves are becoming stronger and more frequent, and are especially accentuated in urban centers due to the heat island effect. Summer precipitation is expected to decrease by 10 to 30% at the global atmospheric increase of 2 °C, and heavy rainfall events are likely to intensify and become more erratic. The sea is absorbing CO_2, which causes ocean acidification at an unprecedented rate of - 0.018 to - 0.028 pH units per decade in surface waters of the North-Western Mediterranean waters, with significant expected consequences on calcifying organisms, impacting marine biodiversity and aquaculture. This situation is even more drastic when taking into account the whole Mediterranean basin from its surface waters to its deepest ones: -0.055 and -0.156 pH units since the pre-industrial period[70]. Wild fire risks are growing with climate change-induced longer fire seasons and increasing heat waves in combination with drought.

67. **Climate change already exacerbates regional challenges, inducing an increase in risks of droughts, floods, erosion, and fires. In the upcoming decades, climate change is expected to further threaten food and water security, as well as human livelihoods and health**. Tourism, fisheries, aquaculture and agriculture have already started to be adversely affected by both changes in

[69] FAO (2018), State of Food Security and Nutrition in the World
[70] Hassoun et al. (2015), Acidification of the Mediterranean Sea from anthropogenic carbon penetration, Deep Sea Research Part I: Oceanographic Research Papers, Volume 102, August 2015, Pages 1-15

general climatic patterns and extreme events. Freshwater resources quality and quantity decrease while warming and decreased precipitation locally lead to the reduction of yields (especially for winter and spring crops in the South) and increased irrigation requirements. Combined with potentially increasing pests, dependence on international food imports will become stronger in SEMC. Fish stock composition and distribution will likely change, with more warm-water species and a decrease in fish size. Unfavourable changes are likely to predominate in Mediterranean aquaculture, adversely affecting investment and growth in a sector projected to be the backbone of increasing sea food supply to meet the growing demands.

68. **Due to a limited tidal range, Mediterranean coastal infrastructures and settlements are often closer to mean sea level, than in most regions of the world**[71]**, which makes them highly vulnerable to sea-level rise, storm-surges, flooding, erosion and local land subsidence**. The sea is rising at an accelerating rate of 2.6 to 2.9 mm per year, implying an increase currently estimated at 52 to 190 cm by 2100[72]. Considering the high concentration of human population and activities in the Mediterranean coastal zone, exposure is high. Sea-level rise also causes salinization of coastal wetlands and aquifers and, combined with a disturbed sediment balance on Mediterranean shores, they lead to erosion. Projections of sea-level may be significantly revised in upcoming years, especially due to unprecedented rapid melting of the ice caps.

69. **Climate change, together with a lack of regulatory and control mechanisms, has accelerated the spread of non-indigenous species leading to a shift in species composition and functioning of ecosystems**. Mediterranean species are partly responding to climatic changes by changing their geographical distribution. However, the expected migration of species to cooler areas as the ocean warms up is limited in enclosed seas like the Mediterranean Sea. Increasing water temperature will lead to more frequent mass mortality events, especially in coralligenous assemblages but also in sponges and mollusks, including in aquaculture sectors. Calcifying organisms are especially vulnerable to acidification. Global warming in combination with direct anthropogenic impacts such as water extraction and pollution, largely affect water budgets in Mediterranean wetlands (salinity, continuity, depth, inundation), and thereby the structure of the communities, which inhabit them, e.g. birds[73].

70. **Considering the particular intensity of climate forcing (increased temperature, precipitation decrease, acidification, extreme events increase), non-climate forcing (population growth, including tourist arrivals), vulnerability and exposure of major stakes (land cover, population density, economic activities, heritage sites), the Mediterranean Basin is considered a climate change hotspot**. A multi-scale risk assessment shows that areas in three out of four Mediterranean countries are at "extremely high risk", with a predominance in SEMC and Italy[74].

IV. Responses – Major progress in addressing regional issues

Main Fact 10 – Progress on policy challenges: cooperation on environmental matters remained active despite unfavorable geopolitical circumstances

71. Previous reports on the state and outlook of environment and development interactions in the Mediterranean published by Plan Bleu in 1989 and 2005 had identified three main policy challenges:

[71] Becker et al. (2012), Climate change impacts on international seaports: knowledge, perceptions, and planning efforts among port administrators. Climatic Change, 110(1), 5-29

[72] IPCC Fifth Assessment Report (AR5) projects between 52 and 98 cm above present levels by 2100 (Church, J. A. et al. in Climate Change 2013: The Physical Science Basis (eds Stocker, T. F. et al.) Ch. 13 (IPCC, Cambridge Univ. Press, 2013)), and a semi-empirical model projects between 75 and 190 cm by 2100 (Vermeer, M. & Rahmstorf, S. Global sea level linked to global temperature. Proc. Natl Acad. Sci. USA 106, 21527–21532 (2009))

[73] Ramírez, et al. (2018), Spatial congruence between multiple stressors in the Mediterranean Sea may reduce its resilience to climate impacts. Sci. Rep. 8, 14871. https://doi.org/10.1038/s41598-018-33237-w

[74] Satta et al. (2015), Towards a multi-scale coastal risk index for the Mediterranean

(i) strengthening regional cooperation; (ii) integrating environment into sectoral policies, and (iii) promoting sustainable local and territory-specific development.

- **Regional cooperation on environmental matters has remained active in the Mediterranean despite unfavorable geopolitical circumstances.** Countries have adopted common objectives, commitments and monitoring frameworks. Stakeholder networks have also expanded and diversified. With the multiplication of relevant information sources and pilot experiences, cooperation will remain a key condition of environment and development progress in the upcoming decades, with permanent cooperation frameworks across different institutions and types of stakeholders a key priority.

- **On integrating environment into sectoral policies, progress has been achieved through the Barcelona Convention and the establishment of integrated tools, including the ICZM Protocol, the Ecosystem Approach and the Sustainable Consumption and Production (SCP) Action Plan.** However much remains to be done, as ambitious regional and international environmental agreements are rarely fully implemented on the ground, and important gaps persist in enforcing them. Ministries in charge of environment remain under-considered and underfunded. With the rapid development of sectors impacting the environment, ensuring a transition towards more environmentally sustainable and socially inclusive sectors remains a critical target, as demonstrated by the mobilization on blue, green and circular economy. Depending on policy areas, regulation, funding, urban planning, or reforming the incentive structure are priority instruments. More complex or diffuse issues require the implementation of a set of instruments through a coherent policy mix.

- **Territorial approaches have been successfully strengthened with decentralization moving forward in some countries, and advocacy for local decision-making progressing through various fora.** Local authorities play for example a crucial role in planning and implementing concrete climate change mitigation and adaptation measures. However much remains to be done in empowering local governments, as applicable.

72. **While progress is notable on some common pollution issues, other environmental areas are of remaining concern, including urban sprawl and ecosystem fragmentation, air pollution, waste management, marine litter, etc.**, with significant impacts on human health and wellbeing, as well as on economic sectors critical for the region. Climate change already aggravates existing vulnerabilities with limited integration to date in relevant policies instruments. The three above mentioned policy challenges remain insufficiently addressed. Regulations and enforcement implementation, and upscaling pilot initiatives to foster efficient transitions are, in particular, critical bottlenecks.

Main Fact 11 - Regional cooperation for common objectives: Mediterranean countries have adopted common objectives and cooperation frameworks, setting a shared path towards sustainable development

73. **Environment and sustainable development remain major areas of regional cooperation**:

- **Over more than 40 years, the Barcelona Convention has led to the adoption of 7 legally binding protocols and numerous strategies and action plans**, including in recent years the ICZM Protocol (2008), the 2016 Regional Climate Change Adaptation Framework for the Mediterranean Marine and Coastal Areas, the 2016 Regional Action Plan on Sustainable Consumption and Production, as well as the Mediterranean Strategy for Sustainable Development 2016-2025 (MSSD)[75]. The adoption of the 2018 Regional Plan of Action for Small-Scale Fisheries in the Mediterranean and the Black Sea under the auspices of the General Fisheries Commission for the Mediterranean (GFCM) also testifies of this appetite for cooperation on sustainability challenges in the Mediterranean region.

[75] MSSD is also built around a vision which consists in "*A prosperous and peaceful Mediterranean region in which people enjoy a high quality of life and where sustainable development takes place within the carrying capacity of healthy ecosystems*"

- **Mediterranean countries have enhanced their legal and institutional capacity to protect the coastal zones**. The ICZM Protocol encourages the development of national coastal regulation, legislation and the creation of coastal agencies. Half of the Contracting Parties have ratified the ICZM Protocol and another six have signed it. For the period 2014-2015, twelve countries submitted their national implementation reports of the ICZM Protocol[76]. Seven countries have a legal framework in place for the protection of the coast[77], and seven others have launched its preparation. Seven countries have a national ICZM strategy[78], and five others are preparing one. Coastal protection agencies or local bodies to protect the coast have been established in six countries[79]. In four additional one, dedicated funds, land acquisition mechanisms or development plans for coastal zone management are in place. A "Common Regional Framework" on ICZM is in development in 2019, with the main objective to introduce maritime spatial planning as an important tool/process for the implementation of ICZM in the marine part of the coastal zone. This framework should help countries plan and manage human activities according to an ecosystem-based approach.

- **Addressing marine litter is a recognized priority policy area of common concern and action**. Acknowledging the importance of prevention and the application of sustainable circular economy principles, the Regional Plan on Marine Litter Management in the Mediterranean (2013) provides for a set of policy, legal, institutional, regulatory, economic, and technical measures, addressing different aspects of marine litter prevention and management from land- and sea-based sources. At national level, important prevention measures have been adopted in the majority of Mediterranean countries. National legislation and policies are in place for recycling (8 countries) and for reducing the use of single-use plastic bags (17 countries) tackling the major marine litter items found in the Mediterranean. A Regional Cooperation Platform on Marine Litter established in 2016 helps exchange good practices, share information and seek solutions together.

74. **Mediterranean countries subscribe to global environmental and sustainable development agreements**:

- **Ratification of international conventions is usually high**. The Convention on the protection of World Cultural and Natural Heritage, Basel Convention, Convention on Biological Diversity, Framework Convention on Climate Change (UNFCCC) and Convention to Combat Desertification (UNCCD) have been ratified by all 21 Mediterranean riparian countries and the European Union. Other conventions and agreements on biodiversity conservation and pollution reduction are strongly supported in the region, such as CITES (on international trade of protected species), CMS (migratory species), AEWA (African-Eurasian Migratory Waterbirds), ACCOBAMS (Cetaceans) and Stockholm Convention (persistent organic pollutants). However, the Nagoya Protocol[80], Minamata Convention[81], Aarhus Convention[82] and Espoo Convention[83] have been ratified by less than 50% of the Mediterranean countries.

[76] Latest report on General Status of Progress in the Implementation of the Barcelona Convention and its Protocols (UNEP (DEPI)/MED IG.23/Inf.14)
[77] Algeria, Egypt, France, Israel, Morocco, Spain, Turkey
[78] Algeria, Croatia, France, Israel, Malta, Montenegro, Spain
[79] Spain, France, Italy, Algeria, Israel, Tunisia
[80] Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (linked to the Convention on Biological Diversity) (2014)
[81] Minamata Convention on Mercury (2017)
[82] UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (2001), and Protocol on Pollutant Release and Transfer Registers (PRTRs) (2009). The Aarhus Convention and its Protocol on PRTRs are the only legally binding global instruments on environmental democracy, empowering people with the rights to access information, participate in decision-making in environmental matters and to seek justice.
[83] Convention on Environmental Impact Assessment in a Transboundary Context (1997). The Espoo Convention sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of

- **2030 Agenda and Sustainable Development Goals (SDGs) are a common reference framework for policy design and evaluation**. Numerous Mediterranean countries have revised or are revising their National Strategy on Sustainable Development to transpose the 2030 Agenda and SDGs at the national level. The MSSD, its monitoring dashboard and the Simplified Peer Review Mechanism (SIMPEER) have contributed to the regional and national implementation of the 2030 Agenda, taking into account regional, national and local specificities.

- **Most Mediterranean countries are committed to the Paris Agreement on Climate Change**. 85% of Mediterranean riparian countries have ratified the Paris agreement and 80% have submitted their first Nationally Determined Contributions (NDC). Some Mediterranean countries have demonstrated an important mobilisation on the international scene, welcoming international or regional climate change events (e.g. Morocco, France). In addition, a 15% increase in renewable energy consumption (2005-2015) regionally[84] indicates an effort to shift from carbon-intensive energy sources to alternatives. However, some renewable energy developments raise debates on potential environmental trade-offs associated with impacts on biodiversity, resource consumption, recycling, etc. that deserve further assessment.

Main Fact 12 – EcAp, ICZM, and MSP: Integration and system-based approaches are increasingly recognized as the most efficient way to address systemic factors, combined pressures and cumulated impacts

75. **Integrated ecosystem-based approaches replace and complement sectoral approaches**. In 2000, Parties to the Convention on Biological Diversity adopted globally the Ecosystem based Approach (EcAp), defined as "*a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment.*" EcAp "*recognizes that humans, with their cultural diversity, are an integral component of ecosystems*"[85]. Since 2008, the Contracting Parties to the Barcelona Convention agreed to progressively apply the Ecosystem Approach to manage human activities in the Mediterranean, with the ultimate objective to achieve Good Environmental Status (GES)[86].

76. **Hydrological basins** (watersheds draining into the Mediterranean Sea) **are recognized as a coherent scale for the management of anthropogenic activities and natural resources**. Water runoff throughout the Mediterranean basin to the sea (with specific flow quantity, quality, timing and duration) supports nutriment, sediment and carbon flows which are essential for the functioning of coastal and marine ecosystems. The increase in the number and capacity of dams in Mediterranean countries[87], as well as changing land cover, water abstraction and pollution caused by direct and diffuse sources, have notable impacts on downstream (coastal and marine) ecosystems and the services they provide, thus calling for a management at the level of the hydrologic basin, as highlighted in the Land-based sources (LBS) Protocol, and taking in due considerations trends and potential policy measures in sustainable land management including agriculture, forestry, soils...

77. **The emergence, consolidation and implementation of systemic approaches remain key to addressing dysfunctions and bottlenecks** within the Mediterranean socio-ecological/economic system, accounting for multiple drivers, pressures, actions and actors and their interactions, rather than specific and isolated factors. In SEMC in particular, increasingly scarce water resources impose an integrated water management and considering the **water, food and energy nexus** when developing

planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.
[84]World Bank (2019), World Development Indicators Database extraction
[85] Convention on Biological Diversity COP 5, CBD 2000
[86] Decision IG.17/6; 2008
[87] NASA's Earth Observing System Data and Information System, Global Reservoirs and Dams Database hosted by Columbia University

a sectoral policy. Systemic approaches also facilitate the reconciliation of conflicting time scales between policies and ecosystem dynamics, giving due consideration to the long term. From the top of the water basin to the boundaries of the Exclusive Economic Zone, EcAp (Ecosystem Approach), ICZM (Integrated Coastal Zone Management), MSP (Maritime Spatial Planning), and Large Marine Ecosystems (LME) are increasingly regarded as complementary and articulated approaches.

Main Fact 13 - Pollution sources: investments and collaborations have addressed some major pollution sources and health hazards

78. **Most Mediterranean people use safely managed drinking water services[88] in 2015, demonstrating continued progress in access to water despite population growth. However, more than 26 million are still to be served**[89]. 6 out of 22 Mediterranean States (Algeria, Egypt, Libya, Palestine, Syria and Turkey) do not yet have monitoring data on the use of safely managed drinking water services[90], indicating a difficulty in monitoring the achievement of SDG Target 6.1. Nevertheless, available data show a significant progress between 2005 and 2015 (increase from 83% to 90% of the population using safely managed drinking water services in monitored countries [91]). However, in Albania, Lebanon and Morocco, more than 30% of the population still do not use safely managed drinking water services.

79. **The proportion of the Mediterranean population using safely managed sanitation services has increased in most countries, but objectives are still far from being reached**. In the past decade, access to adequate and equitable sanitation and hygiene has increased from 58% (2005) to 65% (2015) of the population using safely managed sanitation services[92]. Progress has been recorded particularly in Albania, Egypt, Israel, Lebanon, Morocco, Tunisia and Turkey and the gap between NMC and SEMC decreased. Yet, more than 160 million people do not use safely managed sanitation services. Access to adequate and equitable sanitation and hygiene still represents a tremendous challenge in particular in Egypt, Morocco and Turkey (with over 100 million people lacking safely managed sanitation services in these three countries combined).

80. **Considerable improvement in the treatment of wastewater has led to a significant improvement in bathing water quality; but localized problems subsist** and may even be wide spread when strong rainfall events occur due to stormwater overflow. In 2017, most NMC report over 75% of excellent bathing water quality and over 90% of good or excellent bathing water quality, with exception of Albania with about 12% of poor basin water quality sampled[93]. In part of the Mediterranean, bathing water quality remains a permanent or occasional barrier to tourism and a sanitary risk, in particular due to the difficulty to manage heavy rainfall events, and seasonal activities (tourism) putting limited infrastructure under stress.

81. **Despite a steady increase in oil and other cargo volumes moved by ship, accidental spillages of oil and other harmful substances from ships into the Mediterranean have decreased.** Between 1994 and 2013, approximately 32,000 tons of oil have been released into the Mediterranean Sea as a result of incidents. The proportion of incidents involving oil spills dropped from 56% for the period 1977 - 1993, to 40% for the period 1994 – 2013. 61% of these incidents resulted in a spillage of less than 1 ton[94]. In the Mediterranean, the quantities of harmful or noxious substances (HNS) accidentally spilled have considerably decreased during the period 1994 - 2013 and have become insignificant since 2003. The impact of the international regulatory framework adopted through the IMO as well as technical cooperation at regional level have contributed to this favorable outcome,

[88] Safely managed = improved water source, located/accessible on premises, available when needed, and free from contamination (Source: WHO/UNICEF JMP for Water Supply, Sanitation and Hygiene, WDI)
[89] WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (2017)
[90] UNSTATS and WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (2017)
[91] Mediterranean States excluding Turkey, Syria, Palestine, Egypt, Libya and Algeria
[92] Mediterranean States except Monaco, Montenegro and Syria
[93] EEA (2017), Quality of European bathing water in 2017
[94] REMPEC (2014), REMPEC Statistical Analysis – Alerts and Accidents Database

especially in the prevention of accidental pollution. The support of the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) provides to Mediterranean coastal States since 1976 contributes to this positive trend. However, risks associated with the transport by ships of oil and HNS with possible harmful consequences on biota and ecosystems cannot be completely eliminated, especially in vulnerable areas such as the Mediterranean Sea.

Main Fact 14 – Adaptive policies: capacity to generate knowledge is increasing based on common assessment frameworks and data for decision-making

82. **The capacity to generate knowledge has tremendously increased and new cost-effective sources of information have emerged**. Big and open data, widespread use of remote sensing and GIS, aerial and underwater drones, etc. have considerably increased the capacity to generate and process new data. Internet access and open-source software have allowed citizen science projects to emerge as a virtual and physical place where citizens, researchers and decision makers can cooperate to monitor the state of the environment in the Mediterranean, especially in relation to conservation biology or ecology (e.g. COMBER[95], CIGESMED[96]). The information thereby collected can provide a strong basis for short- and long-term planning and decision-making in the region, while educating the public and enhancing public participation.

83. **Concomitantly, Mediterranean countries have adopted common monitoring and assessment frameworks to improve information-based decision-making**:

- **An Integrated Monitoring and Assessment Programme (IMAP)** is being developed in the context of the MAP system, to assess progress towards the Good Ecological Status. IMAP is based on eleven Ecological Objectives (EO), corresponding 28 operational objectives and their related 61 indicators (27 common and 34 candidate indicators) covering four clusters (i) pollution and marine litter, (ii) contaminants and eutrophication, (iii) marine biodiversity and fisheries and (iv) coast and hydrography. The initial implementation phase of the IMAP (2016-2019) resulted in the development of the first 2017 Mediterranean Quality Status Report.

- **A shared environmental information system**. Mediterranean countries collaborate to improve data availability and access to environmental information. A regional information system to support data collection, reporting and assessment for IMAP is being built in the framework of the MAP-Barcelona Convention. In addition. the EU-supported Shared Environmental Information System (SEIS) for the reduction of marine pollution fosters the regular production and sharing of quality assessed environmental data, indicators and information in Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, and Tunisia.

- **Sustainable development indicators**. Under the 2030 Agenda, countries have committed to a global indicator framework[97] with 232 indicators to monitor 17 SDGs and 169 targets. At the Mediterranean level, support is provided by the MAP through the Mediterranean sustainability dashboard, largely based on SDG indicators. **Awareness and reporting on the link between environmental conditions and human health has improved**. Since 2012, the World Health Organisation reports on the “environmental burden of disease” globally and at national level.

V. Responses: Persisting and emerging challenges

Despite notable progress, Mediterranean countries are not on track to achieve and fully implement agreed goals, including Sustainable Development Goals (SDGs) and Ecological Objectives for Good Environmental Status of the Mediterranean Sea and Coast. The majority of observed trends show developments that are either progressing towards set targets but at an

[95] Citizens’ Network for the Observation of Marine Biodiversity
[96] Coralligenous based indicators to evaluate and monitor the "Good Environmental Status" of the Mediterranean coastal waters
[97] Last amended in March 2019

insufficient rate or unequally across countries, or moving away from the target. Nine out of the 21 Mediterranean countries have achieved none of the SDGs 2030 targets in 2019 and the maximum number of SDGs achieved per country is two (out of 17)[98]. Eleven SDGs remain unachieved in all Mediterranean countries, among which figure SDG 13 "climate action", SDG 14 "life below water" and SDG 15 "life on land". Concerning SDGs 2 on "hunger", 5 "gender equality", 11 "sustainable Cities and Communities" and 14 "life below water", none of the Mediterranean countries shows a trend that is in line with achievement of the objectives by 2030. **Major changes in production and consumption patterns are urgently needed to progress decisively towards inclusive sustainable development, with focus on climate change concerns, biodiversity protection and ecosystem restoration, pollution prevention, circular economy. Transition towards blue/green economy is a key challenge in the region that requires funding of polluting activities to be reoriented towards sustainable activities.** The following key messages are consistent with the UN 2030 development agenda and its SDGs, as well as the MSSD.

Key Message 1 – Enforcement: ensuring effective enforcement of common agreed objectives and commitments

84. **While Mediterranean countries have adopted ambitious objectives and sometimes legally binding agreements** (including Protocols under the Barcelona Convention), **critical gaps remain in implementing and enforcing them**:

85. **The Barcelona Convention provides a twofold mechanism to ensure enforcement of its provisions, yet to be fully enacted**: (i) the compliance committee and (ii) reports by Contracting Parties on measures implemented and their effectiveness (Article 26) reviewed by the COP to recommend potential corrective measures (Article 27). The Compliance Committee of the Barcelona Convention and its Protocols was created in 2008 to help identify implementation and compliance difficulties as early as possible. The Compliance Committee can be triggered by Contracting Parties, the Secretariat and the Committee itself; however, it has not been triggered to date. National reporting of measures taken and evaluation of their effectiveness is insufficient, with a significant number of non-submitted or incomplete reports. The Barcelona Convention does not provide for a sanctioning mechanism in case of non-compliance. Strengthening the fulfillment of Articles 26 and 27 presents an opportunity to close the adaptive policy cycle from planning, to implementation, enforcement, monitoring and evaluation, based on commonly agreed measures.

86. **Enforcement also remains limited at national level**. Human resources, training and budgets in this area are often insufficient to provide effective solutions, and sanctioning mechanisms are often inexistent or ineffective. The systematic inclusion of operational implementation and enforcement instruments into environmental policies remains a key gap and calls for increased efforts and capacity building.

87. **Critical areas for increased enforcement include: illegal waste disposal and dumping, as well as trafficking of waste and protected species** (including criminal activities), **illegal mining** (including illegal sand extraction and smuggling[99]), **illegal fishing** (including in Marine Protected Areas, with enforcement needed along the value chain), **illegal construction in coastal zones and protected coastal areas**, etc. Recent enforcement measures (e.g. on air pollution by ships) and sub-regional collaborations (e.g. on illegal discharge at sea) can serve as examples for upscaling surveillance and legal action on environmental regulations.

88. Leads for strengthening enforcement include:

- **developing and testing of a set of criteria and associated indicators to assess compliance** (including with the Barcelona Convention and its Protocols);

[98] Sachs et al. (2019), Sustainable Development Report 2019, New York: Bertelsmann Stiftung and Sustainable Development Solutions Network (SDSN)
[99] UNEP (2019), Sand and sustainability: Finding new solutions for environmental governance of global sand resources. GRID-Geneva, United Nations Environment Programme, Geneva, Switzerland

- **adopting necessary provisions in national legislation to allow for legal action**; including notions of **precautionary principle**, **environmental prejudice**, **non-regression** on environmental regulations, environmental **prevention**…; and adopting effective legal and administrative mechanisms to implement these principles;
- **strengthening cooperation between judiciary and administrative bodies**;
- **building capacities of judiciary and administrative resources along the enforcement chain**, on environmental legal frameworks, jurisprudence, environmental and economic stakes; with both a general awareness programme and specialized trainings;
- **developing cooperation and synergies with other MEAs Compliance Committees** in areas of common concern including joint activities to promote and facilitate compliance; and
- **developing judicial cooperation at Mediterranean level**. **In the framework of the Barcelona Convention, promising leads for judicial cooperation have been developed with regard to detecting and sanctioning intentional pollution from maritime transport**. The Mediterranean Network of Law Enforcement Officials relating to the International Convention for the Prevention of Pollution from Ships (MARPOL) within the framework of the Barcelona Convention (MENELAS) has been exploring the possible development of regional jurisdictional and judicial cooperation in the Mediterranean, along with a common report that would enable the courts of the Contracting Parties to the Barcelona Convention to prosecute all individuals, irrespective of the place of pollution. MENELAS has also been considering the possibility of accompanying this judicial cooperation with the establishment of a regional "Blue Fund", to which a part of the pecuniary sanctions would be transferred. Stakeholders have mentioned aligning the level of sanctions or nature of acceptable proofs as potential areas for future progress. Administrative and judicial cooperation could be further extended to other policy areas of common interest.

89. **Several cases of judicial litigation have been recorded in European Mediterranean countries**[100]. One of the trends in climate change litigation is related to **holding governments to their legislative and policy commitment, thereby enforcing climate commitments via legal action**.

Key Message 2 – Institutional capacity: raising the profile of environmental institutions and stakes

90. **Policy-making continues to encounter barriers hindering long term considerations** in decisions, whereas ecosystems adaptation and restoration generally require time scales exceeding the duration of a human life. Raising the profile of environmental institutions and stakes requires more decisive actions on areas generally well-known, but addressed at a pace inconsistent with the magnitude of current challenges, such areas include:

- **Expanding stakeholders' awareness and involvement**

91. **Improving public access to information and public involvement, as well as education for sustainable development are key for inclusive action for transitions and raising the political profile of environmental issues**.

92. **Effective policy making for a sustainability transition requires an inclusive and integrated approach that guides behavioral changes at all levels**, and actively involves not only policy-makers, but also dialogues with civil society and the private sector at all stages of the policy-cycle. Inclusive development must pay attention to inequalities and involve civil society in decision and action. In particular women who can play a major role: (i) in promoting sustainable household consumption and investment (e.g. in food/agriculture, in energy) for food security and biodiversity conservation, and (ii) in entrepreneurship and economic development. Mediterranean policies

[100] UNEP (2017), The Status of climate change litigation: A global review

increasingly integrate participatory and multi-stakeholder tools, for example via legislation on Environmental Impact Assessments (EIA) and Strategic Environmental Assessment (SEA) which include mandatory public consultation processes. The young generations and their demands and potential for action are central to short term and longer-term progress, including in countries with strong demographic trends today and tomorrow.

93. **Since the 2000s, the strong increase of mobile phone subscriptions and people using the Internet has opened new opportunities for access to information and public participation in the environmental debate, including through social media**. However, only 12 of the 22 Contracting Parties to the Barcelona Convention are already Parties to the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, which links environmental protection and human rights. Generalizing the accession to the Convention and the fulfilling of its commitments are key levers for inclusive transitions.

94. **Environmental impact assessments are a key source of stakeholder information.** All Mediterranean countries have adopted frameworks for *ex-ante* environmental impact assessment (EIA), in line with Article 4.3c and 4.3d of the Barcelona Convention (in 100% of Mediterranean countries, EIA is a legal requirement, whereas 72% have enacted a legal framework for Strategic Environmental Assessment (SEA)). **Their further extension to Strategic Environmental Assessment (SEA) and to including social assessment, as well as their rigorous application and enforcement, require further efforts**.

- **Understanding and addressing non-environmental stakes associated with environmental decisions**

95. Food security, youth employment, access to water in required quality and quantity, health (in particular in urban and peri-urban areas), are critical policy issues of widespread concern in Mediterranean countries. Assessing and sharing expected co-benefits and trade-offs of environmental decisions on those policy priorities, and discussing them with stakeholders concerned is critical to further integrate environmental objective in development policies.

96. In this regard, strategic stakeholder information includes assessments that demonstrate **economic and social (including health) co-benefits of environmental action**, including cost of inaction. **Natural capital, ecosystem and ecosystem services accounting** could be further developed as a component of national accounts. **Nutritional information and labelling** appear equally critical in particular in the eastern part of the Basin.

- **Raising the profile of administrations in charge**

97. Administrations in charge of the environment often lack institutional strength to enforce environmental policy integration. Legal and institutional mechanisms to ensure policy integration, including explicit deadlines and reporting mechanism (e.g. through coordination mechanisms at the highest level of government, and reports to Parliament) need to be implemented more widely.

- **Removing harmful incentives**

98. Mainstreaming environment into sectoral policies also requires phasing-out of unsustainable practices and removing barriers to change, including environmentally harmful subsidies. Priorities include **continuing to remove subsidies on non-renewable energies** (showing an upward trend at global level after a period of significant decrease), **and groundwater extraction**. **Adequately targeting direct consumption supports to poorest and most vulnerable groups** would help improve the efficiency of environmental measures, in particular in the water and energy sectors of critical importance in the Mediterranean.

- **Upgrading the ambition of specific regulations**

99. **Strengthening adoption**. While six out of seven Protocols of the Barcelona Convention are in force in 2019, three of them are only ratified by half or less than half of the Contracting Parties and still require particular attention to ensure full regional coverage. Those include the Integrated Coastal

Zone Management Protocol (11 ratifications), Offshore Protocol (8 ratifications) and Hazardous Waste Protocol (7 ratifications).

100. **Preparing the designation of the Mediterranean Sea as an emission control area (ECA)**. Recent feasibility studies (2019)[101] examining the possibility of designating the Mediterranean Sea, or parts thereof, as sulphur oxides (SOx) emission control areas (ECAs) under MARPOL Annex VI, indicate that a Mediterranean ECA would result in significant health and environmental benefits, fewer cases of respiratory and cardiovascular diseases and premature deaths avoided annually with health benefits much larger than expected costs. One of the studies also highlights the benefit of the reduction of NOx emission through a NOx ECA.

101. **Regulating emerging activities at sea and emerging pollutants**. Current practices in the use of substances of emerging concern, for which environmental and human health impact studies have not been sufficiently carried out, are not in phase with the precautionary principle and require further regulation. The study of the multitude of emerging pollutants, their interactions with the environment and human health and their treatment is extremely complex and costly. It has not been sufficiently carried out for a number of substances and does not currently keep the pace at which new substances are being created, researched and enter the market. To date, the European Chemicals Agency has registered more than 22,000 substances[102] under the REACH regulation, whereas, worldwide, more than 142 million exist[103]. Accordingly, regulation has difficulty keeping pace with the emergence of new activities at sea, including in areas out of national jurisdictions.

102. **Integrating the mitigation hierarchy in regulations and program design**. Environmentally or socially harmful activities can be regulated in a way to respect the mitigation hierarchy, based on the three steps of avoidance, minimization and then offsets/compensation of impacts, thus leading to more positive environmental and/or social outcomes. While applying the mitigation hierarchy in marine environment is particularly challenging, recent research and pilots across the world provide encouraging results and ground for sharing good practices and strengthening regulations.

Key Message 3 – Local action: Translating national and international commitments into local action, adapted to the territorial context

103. **The gap between the ambition of international agreements and their implementation at the local level needs to be closed while taking into account local specificities**. Many sustainable development strategies and commitments are designed and adopted at the national or international level, but it is at the local scale that concrete action for conservation and management of natural resources for human wellbeing can be taken. This is particularly true for adaptation to environmental and climate change. Clear mechanisms to mainstream international commitments into local planning often lack effective tools that need to be catered to the differing stages of decentralization in Mediterranean countries. Coordination between local administrations and central and decentralized sectoral technical services, as appropriate, requires further capacity building and implementation support to become more fluid and effective.

104. **Managing local risks and sometimes scarce resources will be a particular challenge for local communities or governments**, as appropriate, in a context of climate change. The resilience and adaptive capacity of local communities vary largely around the Mediterranean basin. Local planning approaches can reflect these specificities by integrating locally held knowledge about specific local contexts.

105. **Territory-specific actions include the preservation or restoration of ecosystems providing key services, expected to become increasingly critical in a changing climate, such as wetlands, peri-urban forests and forested ecosystems, healthy agricultural soils, shallow sea shore habitats including posidonia beds and coralligenous assemblages**. Reducing fragmentation

[101] Prepared by REMPEC and two other studies commissioned by the European Commission and France.
[102] European Chemicals Agency (2019), https://echa.europa.eu/fr/registration-statistics-infograph#
[103] American Chemical Society (2019), Base Chemical Abstract Service Database

through corridors is another important territorial priority in both land use planning and investment in restoration. In addition, fire prevention and fighting, flood prevention, heat island effect prevention and management are expected to be critical in a number of locations, with local responsibilities.

106. **Mediterranean islands**. While the issues of sustainable management of resources, limitation of destruction of natural habitats, control of invasive alien species and mitigation and adaptation to climate change are not specific to islands, they are particularly exacerbated in these isolated territories where resources are scarce, space limited and technologies restricted. Nevertheless, islands should not be reduced to vulnerable territories, as they represent resilience laboratories for innovation for biodiversity conservation, sustainable development and transition objectives. The networking among these territories needs to be encouraged in the Mediterranean and beyond, and policies recognizing the singularity and value of these territories should continue to be implemented (in line with the efforts made under the Rio+20 declaration, the Aichi targets and working group on insular biodiversity, the resolution XII.14 of the Ramsar Convention and the ICZM Protocol).

107. **Promote innovative local-level systems and governance models, around emerging (or re-emerging) value chains**. **Collective organization and citizen-led innovations in sustainable agriculture, aquaculture, fisheries and eco-tourism sectors, creating jobs and diversifying the economy, should be further strengthened and supported**. The value chain approach promotes the participation of local producers which individually are "vulnerable", to group and act collectively to overcome market barriers and increase revenue. The value chain approach can also help identify opportunities towards a more circular economy. The attractiveness and preservation of rural territories is compromised by the urban migration of young professionals who lack skills, capital, access to credits and land to develop sustainable businesses in the agriculture, aquaculture, fisheries and eco-tourism sectors. Mechanisms to value local products, i.e. labelling, should be further implemented to value sustainable practices and protect consumer health. In regions where traditional rural activities – including pastoralism and other activities using forests or forested areas - still hold important economic contributions (in particular in SEMC), sustainably managing them is critical.

Key Message 4 – Fostering transitions towards sustainability: Upgrading and diversifying the policy-mix

108. **Efficient environmental policies require adjusted policy mixes[104], as systemic issues can rarely be solved by regulatory measures alone**. Environmental challenges associated with multiple pressures and activities, including strong economic interests, can be tackled only by a conjunction of coordinated instruments through policy mixes, associating regulatory measures with: (i) Economic instruments, fiscal measures, extended producer responsibility in application of the polluter-pays principle, diverse funding mechanisms and partnerships; (ii) Awareness raising, education, labelling and voluntary agreements; and (iii) Instruments supporting environmentally friendly land tenure, land use and land use planning in areas under significant pressures.

109. Other than at the national and local level, policy mixes can be strengthened at the regional level, for example through the implementation of the seventh step of the EcAp roadmap that aims at developing action plans and programmes of measures for achieving GES in the Mediterranean.

- **Completing regulations and plans with appropriate funding mechanisms**

110. Many regional strategies, programs and plans for sustainability are conceived without adequate funding plans and mechanisms. Investments in infrastructure development, including water supply, sanitation, wastewater treatment, waste management, and more recently renewable energy have been key to progress on sustainability indicators, in particular in SEMC. Continuous needs for

[104] Definition from OCDE: "The 'policy mix' could be understood as the set of policy rationales, arrangements and instruments implemented to deliver public action in specific policy domains as well as their interactions. The 'policy mix' concept refers therefore to: 1) the composition of the 'policy mix', i.e. the relative balance between its components, and 2) the interactions between its components.", in OECD Science, Technology and Innovation Outlook 2016

investment are expected in these areas as population continues to grow in SEMC. However emerging challenges are also expected to require considerable public and private investment, with early action a condition to prevent major future costs. On other environmental policies, including biodiversity conservation, ensuring funding to cover recurring costs is a condition of effectiveness.

111. **Climate change adaptation in agricultural, urban and coastal areas is expected to require major investment**. Anticipating adaptation, choosing no-regret solutions including nature-based solutions, and effectively involving the private sector (including banks and insurance) can minimize funding needs.

112. **Water demand management, improvements in water efficiency, reduction of losses and non-conventional resources mobilization, including reuse, as a prelude to increasing available water resources through technological solutions, will require investments and pricing**. Losses and leakages in water supply systems, efficiency defects and waste in irrigation and domestic use are estimated at about 100 billion m^3 in the whole Mediterranean region, equivalent to approximately 45% of the total water demand for both sectors, a significant part of which being avoidable. Positive experiences in the region show that wastewater can be safely recycled for irrigation or aquifer recharge. Israel is a leader in SEMC, with a reuse rate of over 85% on all wastewater collected. In Europe, Cyprus and Malta are the most advanced countries, with 90% and 60% of their treated wastewater being reused respectively, far exceeding European average (2.4%)[105]. To sustain necessary investments and foster demand prioritization, a pricing policy becomes increasingly relevant, in particular in agriculture.

113. **Marine Protected Areas critically lack permanent funding for operating costs**. The marine area covered by conservation measures (Marine Protected Areas and Other Effective Conservation Measures) reached 226,665 km^2 in January 2019, representing just over 9% of the Mediterranean Sea surface, close to the 2020 Aichi target of 10%. However, it is estimated that only about 10% of the sites declared have a proper implementation of their management plans, which is a major determinant for the effectiveness of protected areas. The setting up and implementation of such management plans requires adequate permanent financial and human capacity, which are generally lacking in the Mediterranean. For the management of protected coastal and marine areas in the Mediterranean, a private-public donor trust fund - the MedFund - has been created in 2019, as a sustainable financing mechanism. The MedFund has raised around one fourth of its 3-year financial endowment for supporting the management of 20 Mediterranean MPAs. The fund needs to be further endowed to cover its objectives and expand to additional MPAs in the Mediterranean. The development of innovative funding mechanisms, including public private partnerships is also key to sustained funding.

- **Transitioning towards a green, blue and circular economy**

114. Over the last decades, the Mediterranean has seen the emergence of an encouraging number of promising innovations either restoring the environment or offering alternatives to environmentally damaging solutions (e.g. through EU innovation funding programmes such as BlueMed and InterregMED). Innovative sectors include: sustainable and eco-tourism, waste reuse in a circular economy, toxic substance substitution, agroforestry, agroecology, sustainable fisheries, sustainable aquaculture and local agri-food systems, non-fossil sources of energy/renewables (including energy recovery from waste), etc. Efforts to scale-up these innovations remain critical for a significant impact on environmental quality and job creation. To move decisively towards a blue, green and circular economy, governments and enterprises in the Mediterranean region should build on: (i) a **mix of regulatory and economic instruments**, with attention to proper prices, taxes and subsidies; (ii) **technological and social innovations development** and dissemination / scaling-up through capitalization and mainstreaming; (iii) **multiple financing sources** (in line with the 2015 Addis Ababa agreement): national and international, public and private, conventional and non-conventional,

[105] European Commission, in IPEMED (2019), Reuse of treated wastewater in the Mediterranean

micro-credit…; (iv) **information, awareness raising and training programs** including specialized university modules, and (v) **monitoring** factual progress with indicators and data.

115. Efficiently addressing the transition also requires a precise understanding of non-environmental issues and stakes, including economic and employment benefits and impacts, as well as operational, social, cultural and behavioral aspects, associated with sectors or issues addressed. This most likely requires working with the private sector and local communities' representatives of targeted sub-regions, and may require further developing **sectoral and behavioral knowledge** including in the MAP – Barcelona Convention system.

- **Protecting the coastal zone from urban sprawl and economic pressures**

116. As highlighted in the Common Regional Framework for ICZM adoptedat the Barcelona Convention COP 21 in December 2019, protecting the coastal zone from cumulated pressures in both land and marine sides of the land-sea interface requires an integrated set of complementary and coordinated policy instruments. Besides a legal framework, critical instruments include monitoring and assessment, coordinated planning processes and governance mechanisms, dedicated funding mechanisms (e.g. economic or fiscal instruments), land policy instruments (e.g. land acquisition, concession, separation between ownership and right of use, land stewardship, etc.), training, communication and information, and efficient enforcement systems.

Key Message 5 – Networking and co-construction: Developing permanent collaboration frameworks

117. **Developing long-term interlinkages bridging stakeholder networks and governance fora.** Since Rio 1992 and 2015 Paris Agreement, stakeholder mobilization on sustainable development goals has bloomed, with the emergence of numerous stakeholder networks and governance fora. In the Mediterranean, networks often gather stakeholders of similar profile, and governance fora often focus on a specialized theme. Interrelations between different types of stakeholders and across governance fora are generally limited in time and dependent on externally funded projects. Few exceptions include the Egyptian Sustainable Development Forum at national level, *Parlement de la Mer* in the French Region of Occitanie at the local level, and - at the regional level - the Mediterranean Commission for Sustainable Development, which has recommended to create a Mediterranean Forum on Sustainable Development. Efforts are required to develop long-term or permanent interlinkages.

118. **Investing in policy platforms** can help understand and share experience on suitable combinations of policy instruments. Policy platforms can also provide a context in which synergies and trade-offs between measures can be best dealt with and improve policy learning between countries. On issues specifically associated with economic sectors, countries should build **active alliances of governments, enterprises, scientists and opinion leaders** to implement international agreements and related commitments at global level (e.g. Climate Convention, Biodiversity Convention, Law of the Sea), Mediterranean level (e.g. Barcelona Convention, MSSD) and among neighbouring countries.

119. The sustainability of the cooperation mechanism should be a key concern from the design stage. As most cooperation mechanisms are currently dependent on project funding, innovation may be required to conceive **light, agile and mutually beneficial institutional set ups**. This would in particular apply to necessary long-term science policy interfaces.

Key Message 6 – Foresight: Anticipating the transformation of coastal and marine areas, activities and landscapes

120. **Clean-up and curative measures will not be sufficient**. Measures that prevent degradation from happening are generally less costly and lead to better environmental and social outcomes. Preventive action to counter environmental degradation can only be sufficiently achieved through transformative change in resource use patterns.

121. **With an expected increase in sea level rise, coastal erosion and coastal extreme events**, **adaptive strategies will be required** for organising where needed strategic retreat, and ensure when appropriate a sustainable transition in economic activities and human settlements. These transformations are projected to become game-changers and need to be mainstreamed into new and existing policies.

122. **The "maritimization" of human activities is an emerging trend adding on to the impact on a continued "littoralization". This phenomenon requires extending the approach and practices of integrated coastal zone management towards more offshore waters through maritime spatial planning**. Human activities are increasingly moving towards the sea, with both a continued growth of existing maritime activities and the emergence of new activities rendered possible by technological development at sea. The coastal zone, already subject to a continued pressure from land-based activities and urban development, and saturated by build-up areas in some parts, is an unavoidable base for these new maritime activities, expected to generate additional pressures on fragile ecosystems, in particular in shallow coastal areas. Avoiding, reducing or compensating these impacts is expected to be a major challenge for the upcoming decades.

123. **Monitoring and regulating marine bio-technology industries and underwater extraction of minerals**. Marine bio-technology industries and underwater extraction of minerals including in the deep-sea are still very little developed in Mediterranean countries. However, due to the uncertainty of their impacts on ecosystems and the potential environmental damages, these activities need to be further studied and their expansion will require adjustment and expansion of current monitoring systems and regulations.

VI. Knowledge for action

Given the diffuse nature of information sources and data collection processes, the promising trends previously described risk remaining largely disjoint, significantly reducing their relevance for policy making. Decisive action is required to ensure that the new capacity to generate knowledge directly benefits common agreed monitoring frameworks at regional and/or national levels (including through their expansion to new indicators), and sustainable observation processes and institutions. Such principles could be stated as conditions in programs funding data collection or processing (with evident exceptions for fundamental/theoretical research).

Key Message 7 – Useful knowledge: Putting existing knowledge to use

124. Critical knowledge is generated in knowledge hubs, universities, institutions, local assessments or research programs, or is held by local communities and practitioners, but insufficiently or ineffectively transmitted to decision makers. Despite the development of various instruments for scientific cooperation (in research and innovation), with a strong support from the European Union, significant disparities remain in the level of monitoring and innovation support between NMC and SEMC. When science-policy-practice collaboration and information sharing exist, they are often project dependant and thus short-lived with important entry costs and limited capitalisation across time. Recent initiatives such as the MedECC scientific network on climate change pave the way towards further consolidated and "user-ready" knowledge resources. Efforts could also be further streamlined through efficient data and output sharing platforms.

Key Message 8 – Monitoring: Implementing, sustaining and expanding common monitoring frameworks

125. **Building on existing common frameworks is a condition to efficiently follow-up on recent efforts**. In the context of the Barcelona Convention priorities include:

- **Implementing national monitoring programmes in alignment with IMAP, to fill priority knowledge gaps identified in the 2017 MED QSR**. 2017 MED QSR identified a vast array of knowledge gaps to implement IMAP and develop 2023 MED QSR. On coastal and marine

biodiversity, for example, data on marine habitats are still scare, fragmented and discounted in time and would gain from a complete mapping of the most significant marine habitats.

- **Establishing data exchange protocols,**
- **Covering issues of emerging concern**. Mineral extraction and other emerging activities at sea, as well as the proliferation of pollutants of emerging concern are currently not adequately monitored;
- **Expanding monitoring to also cover drivers, pressures, impacts and responses**, to provide integrated information for the effective design of measures to achieve the GES.

Key Message 9 – Transparency: Documenting and communicating the stakes of environmental degradation and socio-economic inequalities

126. Further integrating sustainable development in public, private and citizen decisions requires documenting and communicating the stakes associated with environmental degradations and increasing inequalities, in particular **stakes associated with SDGs including health, food security and poverty reduction through employment**. On environmental aspects in particular, this would involve evaluating key ecosystem services and socio-economic impacts in relation to (i) potential threats like sea level rise, coastal erosion and extreme events and (ii) environmental targets such as ecosystem preservation, restoration or creation at regional level.

Key Message 10 – Learning by doing: Learning from experience sharing and peer review mechanisms for adaptive policies

127. Multiple technical, social and governance innovations have been developed in the last decade and many more are on-going, with a multitude of actors involved, and often short-lived funding windows. **Well-structured capitalization efforts are required to ensure that future policy development and private action benefit from lessons learned and tools piloted**. Rather than an after-thought, capitalization should be built in project and programme processes. Practitioners and experts should be involved in identifying key conditions and instruments needed for replicating and scaling-up promising innovations as a condition for funding.

128. **Closing the policy cycle by conducting *ex-post* evaluation is key for coherent, transparent and effective policies**. Evidence from *ex-post* appraisal informed via mutualized evaluation processes, can largely contribute to better informed and more effective policies, more interdisciplinary approach and accountability, and potentially reduce the regulatory burden. Rather than general processes and statistics alone, ex-post evaluation should consider some practical applications on the ground, and discuss with practitioners to identify lessons learned, adaptations implemented during the project life-time, and recurrent bottlenecks including behavioral aspects.

129. **The Barcelona Convention provides for a comprehensive policy evaluation mechanism for measures taken by Contracting Parties in application of the Convention; but it is partially implemented and does not currently allow to draw conclusions on the effectiveness of the Contracting Parties' actions**. By virtue of Article 26 of the Barcelona Convention, Contracting Parties commit to report *ex-post* on the measures taken for the implementation of the Convention, its Protocols and the recommendations from the Conference of Parties as well as on the effectiveness of these measures. Article 27 further stipulates that, on the basis of these elements, the Conference of Parties shall evaluate compliance with the Barcelona Convention and its Protocols and recommend potential corrective measures. This policy evaluation mechanism is crucial for the effective implementation of the Convention and its tools and requires further support for Contracting Parties for full application of the provisions of the Convention.

130. **Data gaps are likely to remain a reality in the future and should not prevent decision-makers from taking action**. In application of the precautionary principle stipulated in the Barcelona Convention, stakeholders are invited to take evidence-based action embracing the different available data sources, without delaying the implementation of critical measures when data is incomplete.

Conclusion

131. The sections above have shown that the overarching objective of the Barcelona Convention, “the preservation and sustainable development of a common heritage, in the interest of present and future generations” cannot be reached by pursuing current trajectories and requires transformative change. A systemic modification of behavior calls for an inclusive approach with the active participation of all stakeholders in the different steps of the policy cycle. Urgent action is needed to integrate the environmental, economic and social spheres on realistic yet desirable transition pathways.

Summary of Main Facts and Key Messages

MAIN FACTS: the region is not on track to achieve commonly agreed sustainability goals

1 – Demographic trends: on the rise and increasingly meridional and urban, with younger population in SEMC
2 – Human development: considerable progress in SEMC whilst large North-East/South divides remain
3 – Macroeconomic situation: increased vulnerabilities linked to dependence on international markets and global trends
4 – Good environmental status: the development of human activities depends on the quality of the environment
5 – Pressures from economic sectors: on the rise due to continued and rapid growth in polluting and resource-consuming sectors and diversification of activities in marine areas
6 – Land-cover and land-use changes: continued loss of natural land cover and agricultural land use, particularly in coastal areas
7 – Ecosystem services provision threatened by cumulated impacts: multiple human induced pressures generate cumulative impacts threatening biodiversity and ecosystem services including provision of critical resources
8 – Human health: improved but climate change, ecosystem degradation, pollution of air and water, including through waste, and consumption and production patterns raise increasing health concerns
9 – Climate change impacts: affecting already the Mediterranean, exacerbating existing challenges
10 – Progress on policy challenges: despite difficult geopolitical circumstances, cooperation remained active on a number of environmental matters
11 – Regional cooperation for common objectives: regional cooperation has allowed to collectively define and agree on common objectives and targets for sustainability
12 – EcAp, ICZM, and MSP approaches: increasingly recognized as effective tools to address systemic factors, combined pressures and cumulated impacts
13 – Pollution sources: investments and collaborations have addressed some major pollution sources and health hazards, but major challenges remain
14 – Adaptive policies: capacity to generate coherent, collectively usable and comparable knowledge is increasing based on common assessment frameworks and technology

KEY MESSAGES: Informed, transformative action for sustainable development

1 – Enforcement: enforce common agreed objectives and commitments

At regional level:

- *Develop and test a set of criteria and associated indicators to assess compliance with, including the Barcelona Convention and its Protocols.*
- *Develop jurisdictional cooperation at Mediterranean and sub-regional levels, including with regard to detecting and sanctioning intentional pollution from maritime transport through the Mediterranean Network of Law Enforcement Officials (MENELAS) relating to MARPOL.*

At national level:

- *Adopt the necessary provisions in national legislation to allow legal action.*
- *Strengthen cooperation between judiciary and administrative bodies.*
- *Build capacities of judiciary and administrative individuals and institutions.*

At local level:

- *Encourage existing management initiatives (e.g. water resources management) and strategies (e.g. integrated coastal zone management) and their networking*

2 – <u>Institutional capacity:</u> <u>raise the profile of environmental institutions and stakes</u>

At regional level:

- *Strengthen the ratification of the Barcelona Convention Protocols, particularly the Hazardous Waste Protocol (7 ratifications), the Offshore Protocol (8 ratifications), and the ICZM Protocol (11 ratifications).*
- *Prepare the designation of the Mediterranean Sea as an Emission Control Area (ECA).*
- *Regulate emerging activities at sea and emerging pollutants.*
- *Integrate the mitigation hierarchy in regulations and program design through sharing good practices and strengthening regulations.*

At national level:

- *Strengthen institutions towards integration of environmental concerns into sectoral policies.*
- *Remove subsidies on non-renewable energies and groundwater extraction, targeting direct consumption support to poorest and most vulnerable groups.*

At local level:

- *Expand stakeholder awareness and involvement through:*
  - *Public access to information and participation;*
  - *Education for sustainable development;*
  - *Gender parity: sustainable consumption and investment, livelihoods and economic development;*
  - *Full use of technological opportunities provided by the Internet through mobile devices and social networks;*
  - *Enforcement of Environmental Impact Assessment (EIA) and its extension to Strategic Environmental Assessment (SEA) including social assessment;*
  - *Economic assessments demonstrating the economic and social co-benefits of environmental actions including nutritional information and labelling.*
- *Strengthening the management capacities of local governments (municipalities) and technical agencies and their collaboration.*

3 – <u>Local action:</u> <u>translate national and international commitments into local action adapted to territorial context</u>

At national level:

- *Set up appropriate mechanisms to mainstream international commitments into local planning through coordination between local administrations and central and decentralized sectoral technical services.*

At local level:

- *In the context of climate change, enhance the preservation and restoration of specific ecosystems such as wetlands, peri-urban forests, healthy agricultural soils, and shallow seashore habitats such as Posidonia beds.*
- *Encourage networking amongst small Mediterranean islands, recognizing the singularity and value of these territories.*
- *Promote innovative local-level forms of governance with collective organization and citizen-led innovations in sustainable agriculture, aquaculture, fisheries, and eco-tourism sectors, creating jobs and diversifying the economy.*
- *Promote the value chain approach (including circular economy) to value local products, i.e. labelling, and sustainable practices and protect consumer health.*

4 – <u>Transition towards a sustainable future:</u> <u>upgrade and diversify the policy-mix</u>

At regional level:

- *Identify plausible scenarios for a sustainable future following a participatory approach.*
- *Map out necessary measures and investments in the short, medium and long term to ensure a sustainable transition.*

- *Along the implementation of the EcAp roadmap towards the achievement of GES in the Mediterranean, adopt and enforce the Common Regional Framework for ICZM, recommending the use of an integrated set of complementary and coordinated policy instruments including monitoring and assessment, coordinated planning processes and governance mechanisms, dedicated funding mechanisms, land policy instruments, training, communication and information, and efficient enforcement systems*

At national level:

- *Develop coordinated instruments through policy mixes, associating regulatory measures with economic instruments (fiscal measures, producer social responsibility, polluter-pays principle, public-private partnerships, etc.), awareness raising and voluntary agreements, and sustainable land use planning.*
- *Complete regulations and plans with appropriate funding mechanisms involving the private sector including banks and insurance companies.*
- *Encourage investments and pricing for improving water use efficiency, including wastewater recycling for irrigation or aquifer recharge whilst fostering demand prioritization through pricing policy, in particular in the agriculture sector.*

At local level:

- *Generate permanent funding for MPA operating costs, in particular encouraging private-public trust donor funds like the recently created MedFund at regional level.*
- *Promoting innovative practices, more particularly for eco-tourism development, waste reuse in a circular economy, toxic substance substitution, agroforestry, agroecology, sustainable fisheries and aquaculture, non-fossil sources of energy, etc.*

5 – <u>Networking and co-construction:</u> <u>develop permanent collaborative frameworks</u>

At regional level:

- *Promote the status and influence of the Mediterranean Commission for Sustainable Development (MCSD) and the creation of the Mediterranean Forum on Sustainable Development.*
- *Promote collaboration among stakeholder networks and regional institutions that have a complementary mandate.*

At national level:

- *Promote the setting up of national multi-stakeholder sustainable development committees, and national thematic science-policy interfaces.*

At local level:

- *Promote local and permanent Partnerships between local authorities, the private sector, and the civil society.*

6 – <u>Foresight:</u> <u>anticipating the transformation of coastal and marine areas</u>

At regional level:

- *Set up a robust and operational framework for international waters management in the Mediterranean.*
- *Promote the development of large MPAs in international waters along the Ecologically or Biologically Significant Areas (EBSAs) identification.*

At national level:

- *To face human activities development at sea, including future biotechnology industries and underwater energy and minerals extraction, extend the approach and practices of ICZM to offshore waters through maritime spatial planning including offshore MPAs.*

At national/local levels:

- *With regard to climate change impacts, design adaptive strategies to current and forthcoming sea level rise, coastal erosion, and coastal extreme events, including through a wide-spread use of nature-based solutions.*

7 – <u>Useful knowledge:</u> <u>put existing knowledge to use</u>

At regional level:

- *Promote science-policy interface (SPI) platforms like the MedECC scientific network on climate change towards further consolidated and user-ready knowledge resources.*

At national level:

- *Promote national observatories through the development of efficient data and output sharing platforms (e.g. Coast and Sea national observatory).*

At local level:

- *Promote the combined use of scientific and local knowledge to solve local issues.*

8 – <u>Monitoring:</u> <u>implement, sustain and expand common monitoring frameworks</u>

At regional level:

- *Develop the IMAP common indicators system with appropriate data exchange protocols.*
- *Expand common indicator frameworks to cover SDGs, as well as major environmental pressures and socio-economic drivers.*

At national level:

- *Implement national monitoring programmes in alignment with IMAP, to fill priority knowledge gaps identified in the 2017 MED QSR.*
- *Further develop data collection and exchange at watershed and local levels to ensure that data cover the entire Mediterranean Basin*

At local level:

- *Build up the means and capacity to gather and share data in support of local initiatives.*

9 – <u>Transparency:</u> <u>document and communicate the stakes of environmental degradation and socio-economic inequalities</u>

At regional level:

- *Develop a guide to SDG interactions and peer review mechanisms in the Mediterranean context.*

At national level:

- *Evaluate key ecosystem services and socio-economic impacts in relation to current and potential threats and environmental targets such as ecosystem preservation and restoration.*

At local level:

- *Through existing local platforms, co-document and communicate the stakes associated with degradation or increasing inequalities on environmental, social, and economic components.*

10 – <u>Learning by doing: Learning from experience sharing and peer review mechanisms for adaptive policies</u>

At regional level:

Fully apply the Barcelona Convention comprehensive policy evaluation mechanism where Contracting Parties commit to report ex-post on measures taken for implementation of the Barcelona Convention and its Protocols (Article 26), and the Conference of Parties evaluate compliance and recommend potential corrective measures (Article 27).

At national level:

Invite all stakeholders and institutions to take evidence-based action embracing the different available data sources without delaying the implementation of critical measures when data is incomplete (precautionary principle).

At local level:

- *Build up capitalization as part of project and programme processes, identifying key conditions and instruments needed for replication and scaling-up promising innovations.*
- *Conduct ex-post evaluation considering practical achievements on the ground with practitioners to identify lessons learned and policy adaptation needed during the project life-time.*

Annex II

2019 Report on the State of the Environment and Development in the Mediterranean (SoED 2019)

Summary for Decision Makers

Table of Contents

Annex II: 2019 Report on the State of the Environment and Development in the Mediterranean (SoED 2019). Summary for Decision Makers

Introduction

1. Driven by population growth, unsustainable production and consumption patterns and associated technological development, as well as a persisting coupling of economic growth with resource consumption and carbon emissions, the Mediterranean region is subject to increasing human-induced pressures that have led to a degradation of the environment throughout the last decades. Further land and sea-use change, exploitation of resources and organisms, pollution and climate change are projected to exacerbate already existing systemic and combined fragilities in the Mediterranean, leading to "multiple stresses and systemic failures" (IPCC, 2014), putting health and livelihood at risk.

2. Progress in policy responses and actions to manage the Mediterranean more sustainably has been achieved, leading to positive results compared to scenarios of no intervention. These results have however not been sufficient to reduce the most significant pressures on the environment and to allow for safeguarding the Mediterranean for present and future generations while answering human development needs. Current trends do not allow for achieving Good Environmental Status (GES) of the Mediterranean Sea by 2020. In line with worldwide trends, "global goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors" (IPBES, 2019).

3. The Mediterranean environment can be safeguarded while simultaneously fostering human development, taking into account differences between Mediterranean countries, through urgent and collective efforts for transformative change. A fundamental reorganization of economic and social systems, including changes in paradigms and values, is required to follow the engagement of countries to achieve GES of the Mediterranean Sea and coast and more largely to achieve SDGs under the 2030 Agenda in the region.

I. Socio-economic, political and institutional drivers and trends

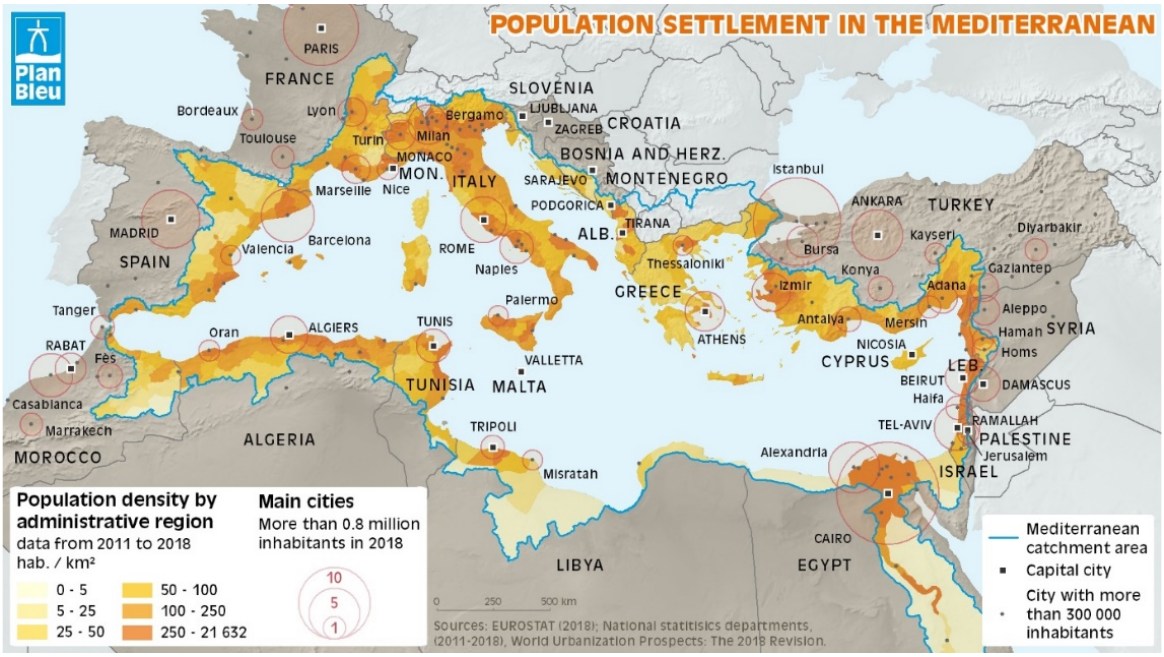


Figure 1: Population density by administrative region and main cities in the Mediterranean catchment area (Source: EUROSTAT, 2018; National statistics departments, 2011-2018, World Urbanization Prospects: The 2018 Revision)

4. Despite their differences, Mediterranean countries remain strongly connected. Countries along the Mediterranean Sea share a common heritage, analogies in lifestyle and values, exposure to climate and environmental risks and impacts, urbanisation and coastal erosion, and an increasing tourism pressure. Contrasts are also important: throughout the last decade, the gap between Northern Mediterranean countries (NMC) and Southern and Eastern Mediterranean countries (SEMC) in human development, demographic dynamics, access to natural resources and environmental protection has persisted. These differences lead to large inequalities in resilience and adaptive capacity to deal with current and projected environmental and climate changes. While facing contrasted situations, countries in the region remain connected through intense flows of people (migration and tourism), goods and energy products (especially via maritime transport), financial resources (foreign investment), information and social interaction (increase in mobile phone subscriptions and number of people using the Internet and social media), as well as via environmental flows (riverine flows and marine currents).

5. The population of the Mediterranean countries is driving environmental change. Its total number increased from approximately 475 million inhabitants in 2010 to 514 million inhabitants in 2018, representing 6.8% of the world population. Almost one third of the Mediterranean population lives in the coastal area and more than 70% in cities. Migration from rural to urban areas continues. The regional demographic context is very diverse in the northern and southern shores. NMC are characterized by a low fertility rate, an ageing population, and a relatively low share of active population. SEMC are in a phase of demographic transition, with a relatively higher population growth, an overall younger population, and subsequently, a higher share of active population.

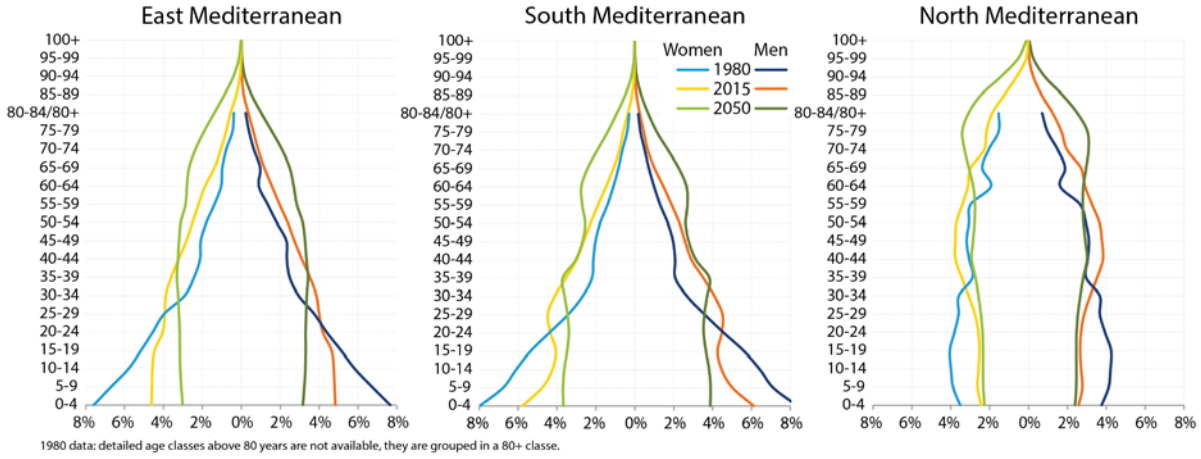


Figure 2: Age distribution of population in the East Mediterranean, South Mediterranean and North Mediterranean, 1980, 2015 and projection of 2050 (Source: World Population Prospects, 2017)

6. The region has always been a crossroads for migration of people and communities. Migration only within non-EU Mediterranean countries involved about 7.5 million people, while migration from non-EU to EU Mediterranean countries involved about 5.7 million people. The number of refugees originating from Mediterranean States is particularly high, coming mainly from Palestine and Syria. The number of refugees hosted in Mediterranean countries is also high, both in terms of absolute number and proportion of refugees to the host country population, in particular in Lebanon, Malta and Turkey. Among the most significant root causes for migration figure war, lack of economic prospects, and climate and environmental changes.

7. In spite of these demographic and geopolitical difficulties, human development, as measured by the Human Development Index, has experienced a general upward trend throughout the last decade. Gaps between the northern and the southern and eastern shores have reduced but persist. Basic education in SEMC in particular has considerably improved throughout the last decade. Girls' education has reached levels equivalent to boys in primary and secondary education, although the

share of women in the active population is still low for most of the region. Youth unemployment is also a major issue in most parts of the basin, with rates of up to three times the national unemployment level.

8. GDP growth rates in SEMC are slightly higher than those of the EU Mediterranean countries, but do not currently allow for a rapid catch-up. In the last twenty years, the share of agricultural and industrial value added in national GDP has decreased in the majority of Mediterranean countries to the benefit of services, which generally account for close to or above half of national GDP. Mediterranean economies continue to rely on unsustainable material consumption and carbon emissions to produce value-added, even if improvements have been achieved in many Mediterranean countries.

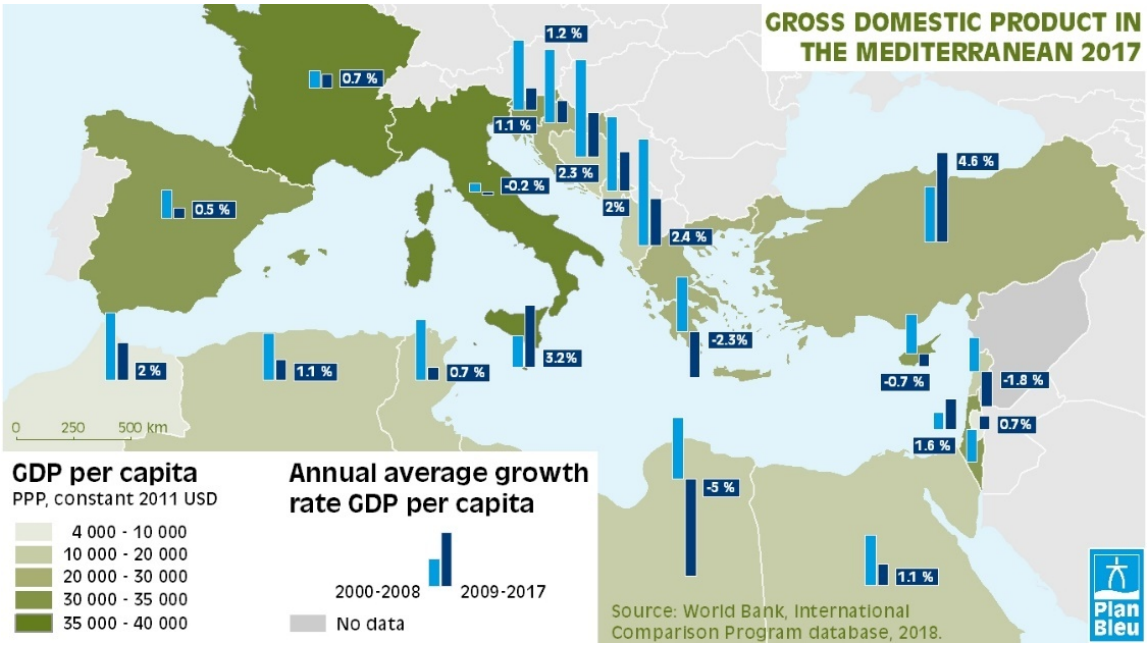


Figure 3: Gross Domestic Product in Mediterranean countries, 2017 (Source: World Bank, International Comparison Program database, 2018)

9. The regional economic context is generally characterized by a high economic dependence on imports, particularly of fossil fuels and cereals. In SEMC in particular, the general trade deficit, coupled with non-diversified economic structures and a budget deficit, reflect and reinforce the difficulty of national economies to enhance their resilience to internal and external conditions and shocks. In parallel, over the last decade, government debt, as a percentage of national GDP, has increased in most countries and reaches close to or above 100% of national GDP in one third of Mediterranean countries. High and increasing debt ratios can be a risk for the financial sustainability and may hinder required public investments in the environment sector. The presence of a significant informal sector is another characteristic of many Mediterranean economies.

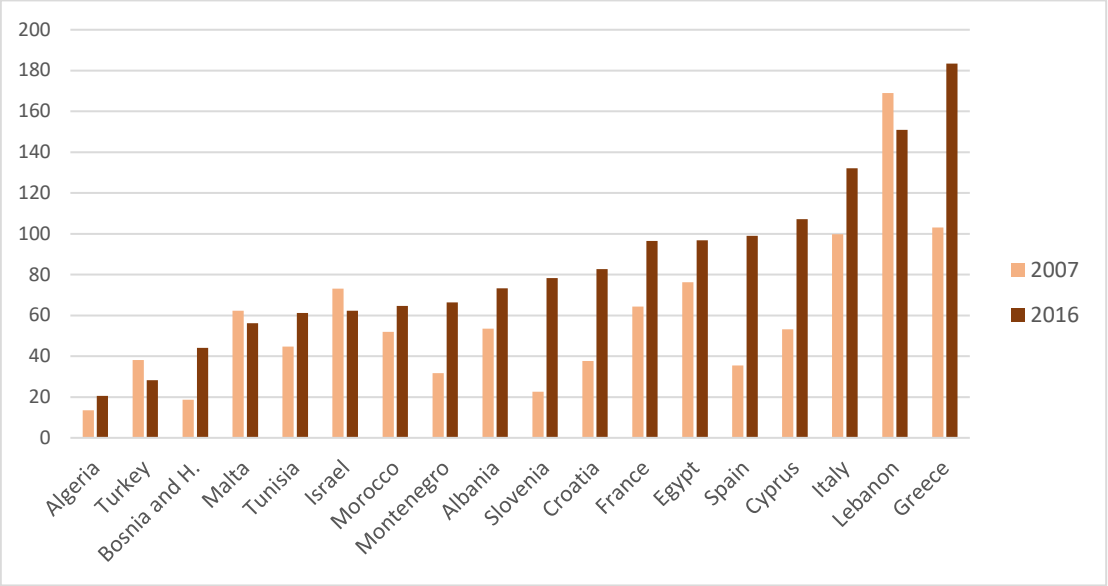


Figure 4: General Government Gross Debt, % of GDP, 2007 and 2016 (Source: IMF World Economic Outlook)

10. Throughout the last decade, cooperation frameworks and integration schemes in Euro-Mediterranean relations have not achieved shared prosperity. Political integration relied on thematic ministerial conferences and parliamentary meetings, and cooperation on security issues. Economic integration progressed with tariff dismantling under free trade agreements, in particular between the EU and accession candidates. However, economic trade within the region is limited.

II. Climate change

11. The Mediterranean basin is already experiencing climate change, at rates that exceed global averages. The IPCC AR5 considers the Mediterranean Region is “highly vulnerable to climate change” due to the influence of multiple stressors and projected associated “systemic failures” through the exacerbation of already existing fragilities, including a high coastal urbanization and a limited adaptive capacity of coastal countries, especially in SEMC.

12. The air temperature in the Mediterranean basin has already warmed by + 1.6 °C above pre-industrial values, well above global average, and future projections indicate a warming of around + 2.2 °C when the global average will pass the + 1.5 °C threshold. Warming will be more evident during summer months, and heat waves are expected to occur more frequently than in the past, especially in the East, with further amplification in cities due to the “urban heat island” effect. The frequency and intensity of both droughts and heavy precipitation events has already increased since 1950 and is expected to continue to grow. A 2 °C global warming will likely be accompanied by a reduction in summer precipitation of about 10 to 15% in some areas, while an increase of 2 to 4 °C would imply a reduction of precipitations of up to 30% in southern Europe, especially in spring and summer. Heavy rainfall events are likely to intensify by 10 to 20% in all seasons except summer. The Mediterranean water temperature is also expected to rise between + 1.8 °C and + 3.5 °C by 2100, with hot spots expected in the east of Spain and in the eastern Mediterranean Sea. In addition, sea level is expected to rise at about 3 cm per decade, a sharp increase compared to the period 1945 to 2000 (0.7 mm per year) and similar to global sea level increase. Finally, the Mediterranean Sea is subject to ocean acidification[106].

[106] Decrease of water pH due to the absorption of the CO_2 emitted by human activities

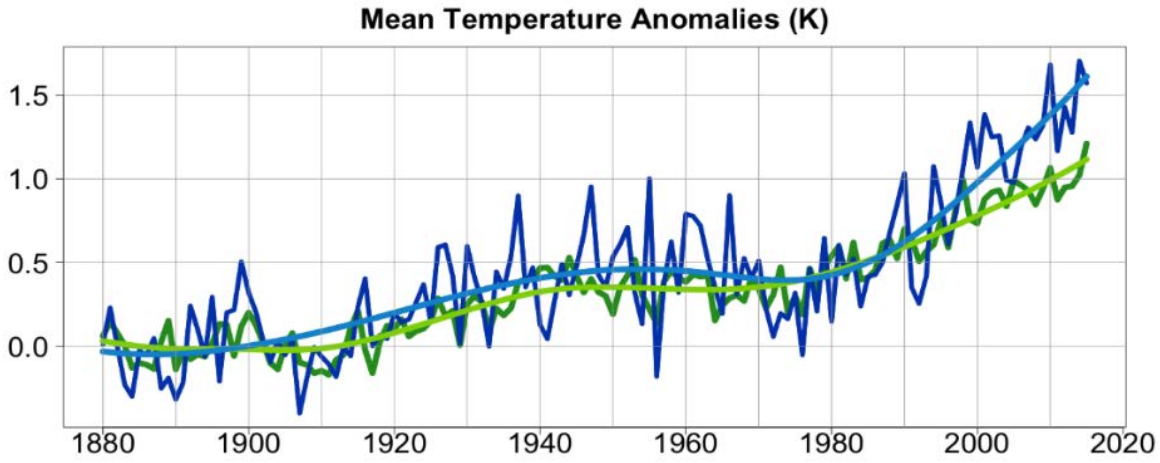


Figure 5: Historic warming of the atmosphere, globally and in the Mediterranean Basin. Annual mean air temperature anomalies are shown with respect to the period 1880-1899, with the Mediterranean Basin (blue) and the globe (green) presented with and without smoothing. Data from Berkeley Earth available at http://berkeleyearth.org/ (Source: Cramer et al, 2018).

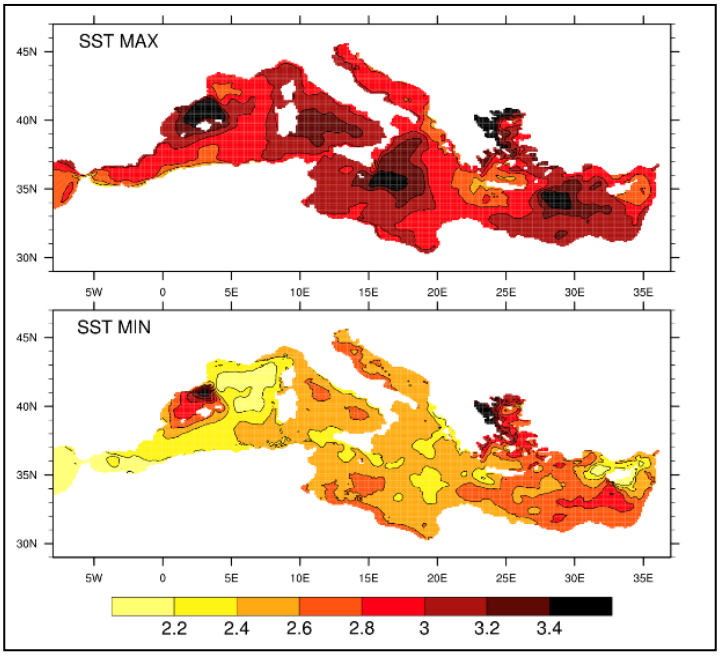


Figure 6: Sea surface temperature anomalies maxima (top) and minima (bottom) for the 2070–2099 period (vs. 1961–1990), in °C (Source: Adloff et al. 2015).

13. Climate change is expected to have significant impacts on the terrestrial, coastal and marine environment of the Mediterranean region. These include an expected increase in aridity, due to reduced precipitation and warming; an increased risk of more frequent and severe fires with projected increases of burnt area between 40% and 100%; and, negative impacts on the wildlife of inland wetlands and freshwater ecosystems by falling water levels and reduced water quality. The expected decrease in ecosystem integrity, biodiversity, and carbon storage capacity will lead to soil erosion, soil fertility loss, and desertification. Overall crop productivity is expected to fall by over 20% in 2080 in Mediterranean countries, with peaks of an almost 40% decrease in Algeria and Morocco, threatening the already challenging food security of a population that is expected to grow.

14. The particularly high density of coastal population and infrastructure on the shoreline, linked to a limited tidal range, make the Mediterranean coast particularly vulnerable to changes in climate and sea level. Extreme rainfall and droughts, combined with sea-level rise, will contribute to higher risks of coastal flooding and erosion, with increasing damage to key infrastructure and highly populated and growing cities, which are primarily located in the coastal area. In particular, the effects of sea level rise are expected to be high for most low-lying coasts of the Mediterranean basin. These risks may be even higher along the southern and eastern shores, where monitoring systems are limited and the adaptive capacity is generally lower than in the north. Coastal erosion and flooding will generate loss of coastal land where important cultural heritage sites are located with 85% of the 49 low-lying World Cultural Heritage sites being at risk of flooding and 75% at risk of coastal erosion, already today.

15. Sea warming and ocean acidification are expected to have negative impacts on marine biodiversity and dependent human activities, while wave and storm surge activity will likely decrease in a warmer future. Increased water temperatures will: lead to a rise in mass mortality events of sensitive species (especially coralligenous, sponges, and mollusks), favor warm-water affinity species including non-indigenous at the expense of cold-water affinity ones, and cause increased hypoxia or anoxia in large coastal areas. Ocean acidification will impact organisms producing carbonate shells and skeletons, such as calcifying plankton organisms, and other pelagic and benthic organisms with calcareous body parts, such as corals, mussels, and sponges, affecting tourism and aquaculture.

16. Mediterranean countries are designing national frameworks to mitigate and adapt to climate change. These efforts need to be urgently implemented, effectively enforced and their ambition strengthened in a multi-stakeholder context.

III. Biodiversity and ecosystem services

17. The Mediterranean is a semi-enclosed sea with multiple types of coastline including deltas, coastal plains, high cliffs, and mountainous areas, providing various natural and anthropogenic landscapes, and multiple types of sea-bottoms hosting diverse ecosystems and habitats. It counts more than 17,000 marine species (4 to 18% of the world’s known marine species), while only representing around 1% of global ocean volume. The Mediterranean also holds the highest rate of endemism at global level (20 to 30% of species are endemic). It is considered as a biodiversity hotspot.

18. Mediterranean coastal ecosystems include wetlands, coastal aquifers, forests, agricultural land and soft and rocky shores. Mediterranean wetlands are characterized by a rich endemism, and host tens of millions of migratory, wintering, and breeding water birds. Wetlands provide several ecosystem services, including the capacity to mitigate impacts of floods, freshwater provision, carbon capture and recreational services. However, wetlands experience habitat loss (- 48% since 1970), due to pressures such as conversion of wetlands to agricultural and urban areas, water pollution, alteration of the hydrological functioning, overfishing, coastline retreat, and sea level rise. A total of 397 Mediterranean Wetlands of National Importance has been designated (of which 113 sites are mainly coastal and marine), in the framework of the Ramsar Convention, 44% of which have developed a management plan.

19. Coastal aquifers are an essential source of water supply in the Mediterranean catchment but are limited and unevenly distributed. They support many ecosystems, and provide essential ecosystem services, including water purification and storage, biodegradation of contaminants, nutrient recycling, and mitigation of floods and droughts. Current pressures on water resources are derived from increasing water demand linked to population dynamics, economic and social development, technological trends, and the increment of climate change. These pressures often lead to groundwater pollution, level depletion and seawater intrusion, which causes the salinization of soil and underground resources. It is therefore essential to manage groundwater using the Integrated Water Resources Management (IWRM) approach, in combination with Integrated Coastal Zone Management (ICZM).

20. Forests are steadily increasing in Mediterranean countries, from 68 million ha in 1990 to 82 million ha in 2015. They are particularly important because they represent both a regional identity, a source of economic wealth, and a key element to sustainably manage watersheds in a region prone to erosion issues. They provide important goods and services, such as timber and non-timber products, primary production, nutrients recycling, air quality, climate and hydrology regulation, soil protection from erosion, and cultural and recreational services. These ecosystem services are particularly important in proximity of urban areas, which is also where they experience the highest pressures. In NMC, forest fires are larger today than half a century ago due to increased fire risk from biomass accumulation linked to land abandonment; while, in SEMC considerable degradation exists due to intensive fuelwood extraction and grazing. Climate change and linked increased and prolonged drought and fire risk are further challenging forest dynamics. Recognizing the importance to protect forests, eight Mediterranean countries (Algeria, France, Israel, Lebanon, Morocco, Spain, Tunisia, and Turkey), in addition to Iran and Portugal, endorsed the Agadir Commitment that compel them to restore at least eight million hectares of degraded forest ecosystems by 2030.

21. Major Mediterranean agroecosystems are based on irrigated crop farming (large-scale and small-scale, traditional and commercial), pastoral/livestock and rainfed agricultural exploitations. They occur in two distinguished zones, namely fertile areas with large scale irrigated and rainfed systems and marginal zones in mountainous areas or semi-arid non-irrigated fields where agriculture interferes with pastoralism. Supporting dry and hot summer months, typical crops include: olive trees, grapes, citrus, nuts, fresh vegetables, leguminous and wheat. Traditional systems associate the culture of cereals or legumes with trees (olive/almond trees, etc.) and are thought to provide productivity, resource efficiency and resilience. However, their role in agricultural production and other ecosystem services, such as carbon sequestration, biodiversity and soil conservation, water regulation, pollination and cultural services is challenged by modernization and intensification. Small-scale family farming systems contribute significantly to ensuring food supply to rural households, providing products which are adapted to local needs and purchasing powers, thereby supporting food security in the Mediterranean region.

22. Mediterranean coastal environments (soft sediment coasts, muddy environments, rocky and soft shores and cliffs) provide important ecosystem services, such as shoreline stabilization and buffering, coastal defense, groundwater storage, and water purification. They suffer from accelerated erosion rates and substratum loss of rocky shores due to urbanization and coastal infrastructure expansion, sea level rise, and reduced river sediment inputs. About 1,238 coastal terrestrial species are identified by IUCN as threatened with extinction. Major drivers of species extinction include tourism and recreational activities, urbanization, agriculture, livestock, and invasive species.

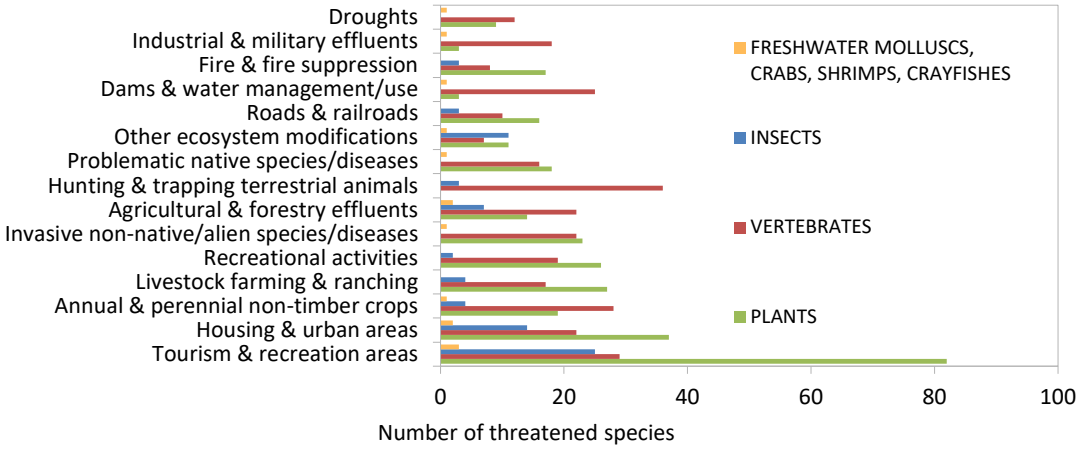


Figure 7: Main threats affecting coastal species in risk of extinction (IUCN Red List Categories CR, EN and VU) in the Mediterranean region (Source: IUCN)

23. Seagrass meadows, coralligenous assemblages and dark ecosystems are the most representative marine ecosystems particular to the Mediterranean Sea. Seagrass meadows, especially the endemic species *Posidonia oceanica*, show signs of regression due to both natural and anthropogenic pressures. Coralligenous ecosystems cover about 2,760 km^2; they contribute to climate change resilience, and generate a remarkable natural productivity that contributes to the maintenance and development of fisheries resources, while being also attractive for tourists and scuba divers. Destructive fishing gears, boat anchoring, invasive species, pollution, and climate change are the main threats to coralligenous habitats and the species they host, with reported cases of mass mortality events and slower growing rates. Dark habitats, in which aphotic ecosystems rely, are among the most fragile and unknown components of the Mediterranean marine biodiversity. They support commercial fishing resources and have an important role in biogeochemical cycles sustaining the balance of the marine trophic chain. They are threatened by land-based nutrients, waste discharge (including litter) and oil and gas activities. There is a growing awareness of the need to preserve dark habitats; in 2005, the FAO-General Fisheries Commission for the Mediterranean (GFCM) adopted a ban on the use of towed fishing gears in depths beyond 1,000 m. Current knowledge on these particular ecosystems still needs to be improved, promoting capacity building for habitat mapping and information sharing among coastal countries. At least 78 marine species assessed by IUCN are threatened with extinction, especially cartilaginous fish, marine mammals, reptiles and corals, due to interaction with fisheries, overfishing and other anthropogenic pressures. From 1950-2011, the Mediterranean has lost 41% of top predators including marine mammals. Projections show that more than 30 endemic species would become extinct by the end of the century.

24. Finally, non-indigenous and invasive species are increasingly present in the Mediterranean region. By 2017, more than 1,000 non-indigenous marine species have been recorded in the Mediterranean Sea, with 618 species considered established. The main vectors for introductions are corridors and maritime transport (through ballast water and hull fouling). Non-indigenous and invasive species may have negative impacts on marine ecosystems and dependent economies and societies.

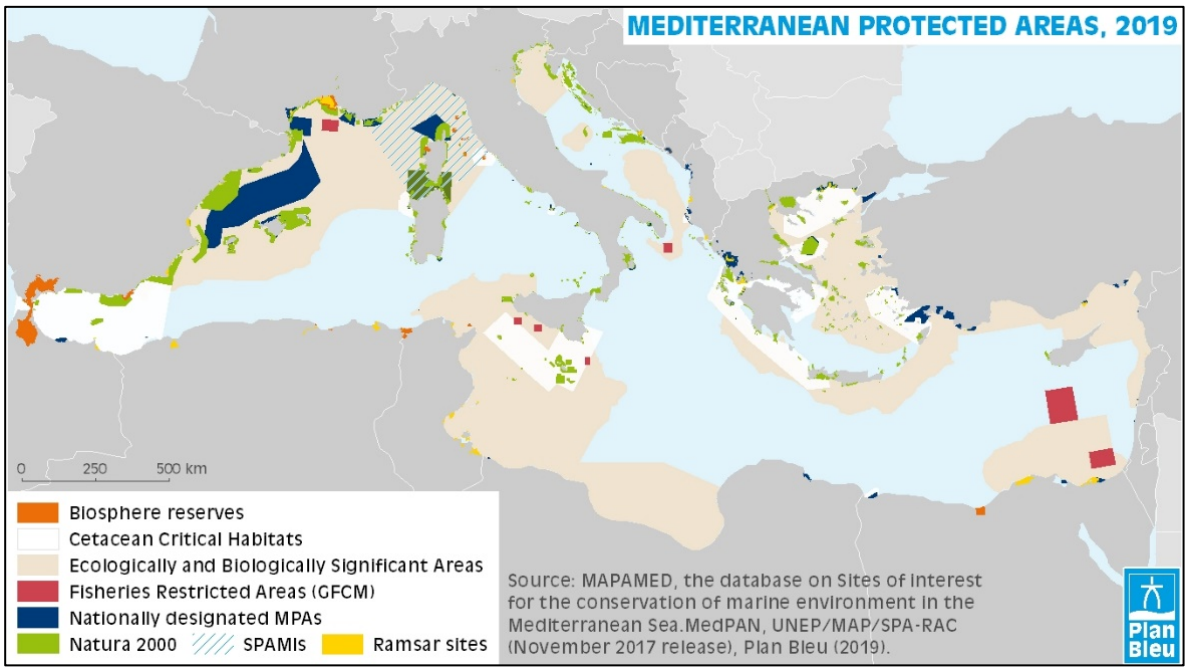


Figure 8: Mediterranean protected areas, 2017 (Source: MAPAMED, 2017, Plan Bleu 2019)

25. The building of a coherent, representative, and well managed network of Marine Protected Areas (MPAs) is a priority in the Mediterranean region. To date, about 1,200 MPAs and other effective area-based conservation measures cover over 8.9% of the Mediterranean Sea, close to the global Aichi 11 and SDG 14 Target of 10% coverage. However, only about 10% of these sites properly implement management plans, due to the lack of financial resources and skilled staff, as well as legal and policy gaps.

IV. Economic activities and their pressures

26. Production and consumption patterns in the Mediterranean region have been undergoing profound changes throughout the last decades, which have led, in combination with demographic growth, urbanization, and a raise of living standard, to increasing resource consumption and environmental degradation. The increase in the demand of processed, refined food, manufactured goods and in coastal tourism couple with food loss and waste packaging overuse and the associated losses of scarce resources such as water, land and energy. This adds to inefficient industrial processes and unsustainable waste management, putting further pressure on natural resources on which Mediterranean economies depend.

27. Agriculture always played an important role in the socio-economic development and is anchored in the Mediterranean identity. However, its importance has been gradually declining in the last decades, both in terms of its share in GDP generated, as well as in the number of farms and employed people. In the northern shore, this is mainly due to agricultural modernization and the consequent raise in labor productivity. Agricultural modernization and massive rural exodus released land and surplus labor; this structural transition has not yet fully taken place in the southern countries. Quantities of fertilizers and pesticides used for agriculture in Mediterranean countries are above the global average, with on average 6.7 kg of pesticides per hectare against a global average of 2.1 kg; and 176 kg (NMC) and 185 kg (SEMC) of fertilizers per hectare compared to a global average of 138 kg in 2015. The main environmental impacts of the agricultural sector include the run-off of nutrients and agrochemicals to the sea, which leads to algal and phytoplankton blooms, eutrophication, and bioaccumulation of chemical pollutants, as well as high resource consumption (water, soil, energy).

28. Fisheries play an important socio-economic role across the Mediterranean region, in terms of food production (landings representing 850,000 tons in 2016), revenue (approx. 2.44 billion USD annually[107]) and employment (>227,000 direct jobs onboard fishing vessels, plus indirect job opportunities for fish processing). Turkey and Italy have the highest fishing capacity and production levels across the region. Capture fisheries are dominated by small pelagic fishes (mainly sardine and European anchovy). Polyvalent vessels represent 77.8% of the Mediterranean fishing fleet, indicating a predominance of small-scale, diversified fishing, providing significant employment. Trawlers are also common (8.6% of fleet), especially in the western basin and Adriatic, and represent the highest revenue. However, fisheries are highly threatened by overfishing, pollution, habitat degradation, invasive species and climate change. 78% of Mediterranean and Black Sea stocks (for which validated assessments are available) are fished at biological unsustainable levels, based on Ecological Objective indicators related to biomass, fishing mortality and total landings. The overexploitation index of most species identified as “priority species” have been decreasing since 2012 (except for sardine and European anchovy), nevertheless considering current mortality regimes, regional fisheries tend toward collapsing, leaving no fish for future generations. Discards represent a window for improvement in the fishing sector as 18% of total catches are currently discarded. Aquaculture creates additional pressures on fish stocks due to the use of wild fish for feed and the transfer of non-indigenous species.

29. The Mediterranean holds 4.6% of global natural gas reserves and 4.2% of global oil reserves; they are located almost entirely off the coast of Algeria, Libya, and Egypt. However, there are other production areas off the coast of Italy, Greece and Turkey and recent discoveries of major gas

[107] first sale value

reserves in the Levantine basin and many areas holding hydrocarbon potential have not yet been explored. The main pressures posed by offshore exploration and drilling are resource depletion, underwater noise, and accidental discharges of oil and other substances. Underwater noise induces physical damage and behavioral changes in marine mammals. At the same time, oil spills lead to the reduction of plankton, and the physical damage and population decline of fish stocks, marine mammals, and birds. Finally, the spillage of other chemical substances exacerbates the impacts of pollution, such as bioaccumulation and biomagnification of marine organisms.

30. Thanks to its unique combination of mild climate, rich history and cultural heritage, exceptional natural resources and proximity to major source markets, the Mediterranean region is the world's leading tourism destination, receiving about one third of the world's international tourists. The Mediterranean basin is also the world's second largest destination for cruise ships. Tourism contributes directly to about 11% of the total economic wealth and jobs in the region. It is extensively developed in NMC and has witnessed a significant growth in SEMC over the last twenty years, despite a slowdown of international arrivals in the South from 2011 onwards, showing the sector's volatility and poor resilience to shocks. In parallel, there has been a significant and rapid increase in cruise ship movements over the last decade; the number of single cruise passengers in 2017 (24 million) was more than double compared to 2006. The economic growth of tourism activities has often been to the detriment of environmental integrity and social equity. Mass tourism with a high seasonality is a major consumer of natural resources, especially water, food and energy, and pollutes marine and freshwater environments. Tourism-related coastal man-made infrastructures may alter and damage landscapes.

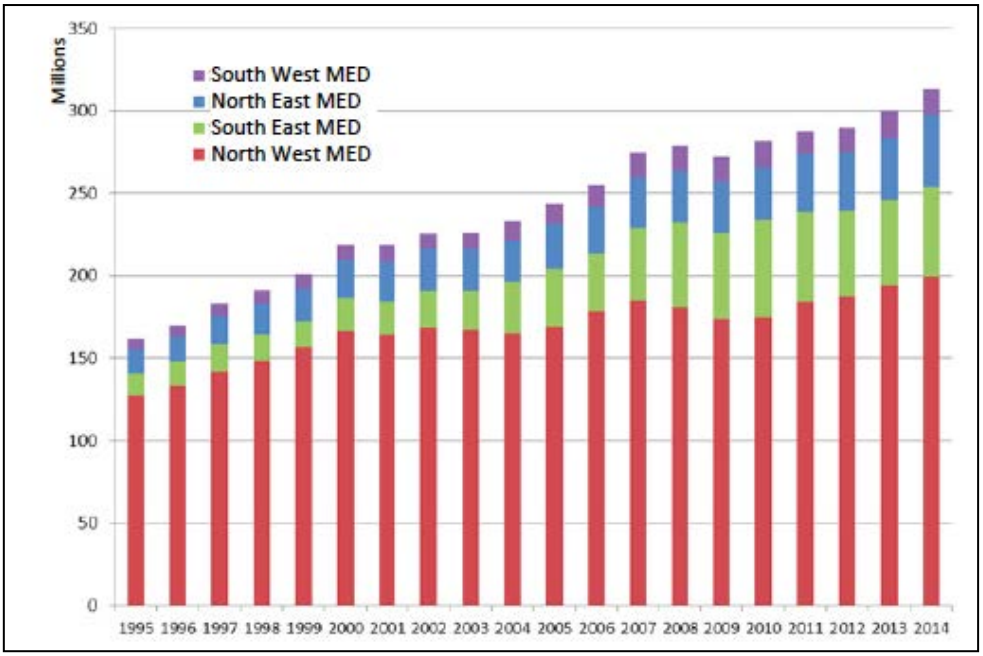


Figure 9: Mediterranean International Tourist Arrivals 1995-2014 (Source: Plan Bleu 2016, based on UNWTO Data 2016) (updated figure pending)

31. Transport is the highest energy-consuming sector in the Mediterranean. Public transportation and train systems are developed in the northern shore, while they need further development on the southern and eastern shores. Road transport generates ambient air pollution, exposing people to hazardous emissions of air pollution, noise, and anthropogenic heat, with an associated high cost in terms of welfare loss. Investments in public transport and electrification, as well as urban planning measures are needed to reduce these impacts. In parallel, commercial aviation continues growing in the Mediterranean region, above 300 million passengers annually. Aviation is responsible for an

estimated 4.9% of global anthropogenic greenhouse gas emissions and existing technological solutions to decarbonize aviation are not mature at this stage.

32. The Mediterranean Sea is the crossroads of major global maritime passages, namely the Suez Canal, the Strait of Gibraltar, and the Bosporus and Dardanelles Straits. Intra-Mediterranean traffic accounts for 58% of total traffic, with a steady increase over the last decade. Europe is the main shipping connection, receiving about 40 to 50% of total extra-Mediterranean traffic. Oil transport and cruise ship tourism are the two most important activities. The Mediterranean Sea hosts major oil transportation lanes; in total, the Suez Canal and the Turkish Straits accounted for about 13% of the world's seaborne oil trade in 2015. Major impacts of maritime transport include operational, accidental or intentional pollution from the release of oil, litter, and hazardous and noxious substances, including toxic gases and particulates such as sulphur oxides (SOx) and nitrogen oxides (NOx), as well as greenhouse gas emissions; introduction of non-indigenous species through ballast waters; and underwater noise.

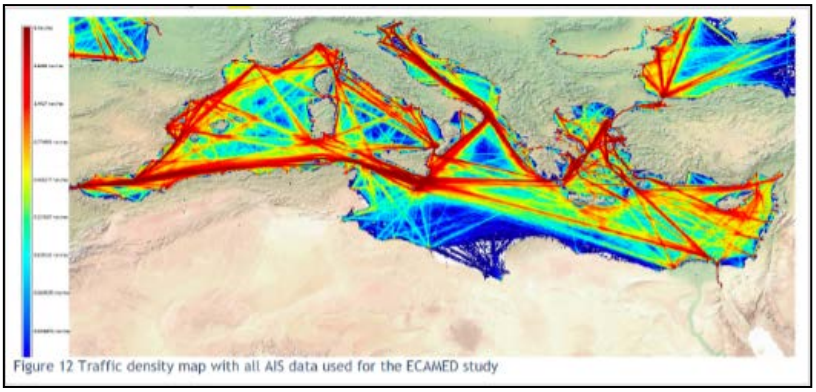


Figure 10: Traffic density in the Mediterranean Sea Area (Source: INERIS, 2019)

33. Emerging sectors with potential development include the marine biotechnology sector, i.e. the search for genes, molecules, and organisms with features that may be of benefit for society and have value for commercial development, and marine and seabed mining, i.e. the production, extraction and processing of non-living resources in seabed or seawater. Currently, there are no deep-sea mining activities in the Mediterranean Sea, mainly because of the low resource potential of the region, as well as low technological development, and regulation of these activities is currently lacking. Deep-sea mining activities may adversely affect deep-sea ecosystems through physical alterations, stirring-up of potentially toxic sediment plumes, noise, vibration and light induced, or through inappropriate waste management.

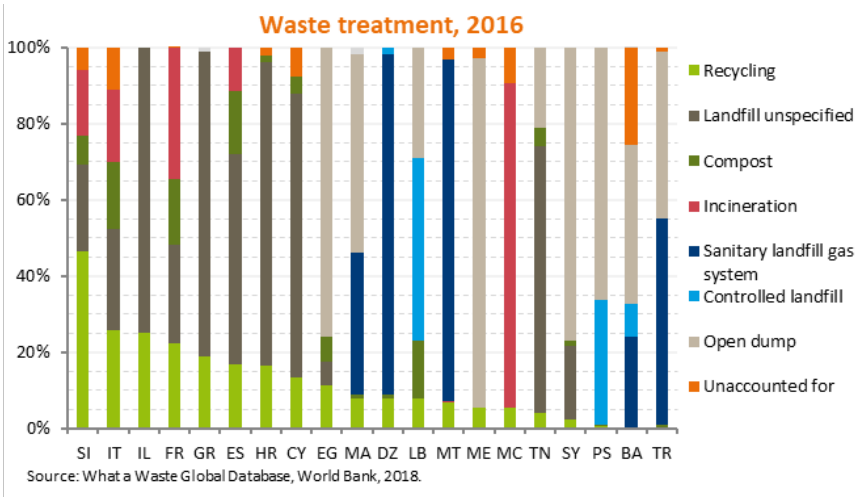


Figure 11: Waste treatment in Mediterranean countries, 2016 (Source: What a Waste Global Database, World Bank, 2018)

34. Nutrients, heavy metals, persistent organic pollutants (POPs), pesticides, hydrocarbons, and marine litter are the main pollutants of the Mediterranean Sea. Eutrophication represents a major issue in coastal areas that are known to be influenced by natural and anthropogenic inputs of nutrients, such as the Gulfs of Lion and Gabès, the Adriatic Sea, northern Aegean, and Nile-Levantine. Levels of major pollutants show a decreasing trend, even though important issues remain, especially for heavy metals in coastal sediments, as well as for known hotspots associated with urban and industrial coastal areas. A decreasing trend has been observed for aqueous effluents from specific industrial sectors, such as the food and beverages, metals production and processing, and paper and wood production, while increasing trends have been observed for waste and wastewater management and the energy and chemical sectors. Emerging pollutants, such as plastic additives, cosmetics, plasticizers, nanoparticles, and pharmaceuticals, represent an under-investigated threat to ecosystem and human health which deserves attention, especially because, to date, municipal treatment plants are unable to remove them. Underwater noise is also an issue of raising concern for its major impacts on cetaceans, especially in relation to identified hotspots overlapping important habitats of cetaceans such as the Pelagos Sanctuary and the Strait of Sicily.

35. The Mediterranean Sea is one of the most marine-litter affected areas in the world. More than 200 tons of plastic enter the Mediterranean Sea every day, and plastics account for up to 95 to 100% of total floating marine litter, and more than 50% of seabed litter. Single-use plastics represent more than 60% of the total recorded marine litter in Mediterranean beaches, which is typically generated from beach recreational activities. Major causes of plastic pollution include the increase of plastic use, unsustainable consumption patterns, and ineffective and inefficient waste management practices. Less than one third of the plastic produced each year in Mediterranean countries is recycled. Wastewater is also an important pathway through which marine litter enters the sea. To date, less than 8% of wastewater undergoes tertiary treatment. Other important sources of marine litter are fisheries, tourism, and shipping. Marine litter impacts marine organisms mainly through entanglement and ingestion, but also through colonization and rafting. It also has economic and social impacts through clean-up costs, as well as potential loss of income and jobs from tourism, residential property values, recreational activities, and fisheries.

36. In 2016, the Contracting Parties to the Barcelona Convention adopted the Regional Action Plan on Sustainable Consumption and Production (SCP) in the Mediterranean. The Action Plan recognizes that patterns of consumption and production need to be changed to decouple human development from degradation of the marine and coastal environment and gives guidelines for a shift towards sustainable consumption and production patterns, long-term sustainability, circular economy and new paradigms in the use of resources, while taking into account climate change and contributing the 2030 Agenda. The SCP Action Plan is supplemented by a roadmap, and further efforts are required for its effective implementation.

V. Marine and coastal zone management

37. For Mediterranean economies and societies, the coastline has long been an area of concentration with an increasingly high population density and related infrastructure as well as touristic, commercial and industrial stakes, many of these situated close to mean sea level. This 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 and disrupting ecological continuity. It also makes coastal zones highly vulnerable to sea-level rise, storm-surges, flooding and erosion.

38. The built-up area in the Mediterranean coastal belt has continued to increase in all Mediterranean countries throughout the last decade; and between 1965 and 2015, three out of four Mediterranean countries doubled or more than doubled the built-up area in the coastal belt of 1 km from the coastline. This leaves less space for natural coastal ecosystems, diminishing the services they provide, and increases coastal risks for the people living in the coastal zone. The Integrated Coastal Zone Management (ICZM) Protocol of the Barcelona Convention, in its article 8, provides that

Contracting Parties shall establish in coastal zones, a zone of at least 100 m in width where construction is prohibited. However, the built-up area within the first 150 m[108] wide belt along the coastline is above 20% in almost half of Mediterranean countries (in 2015).

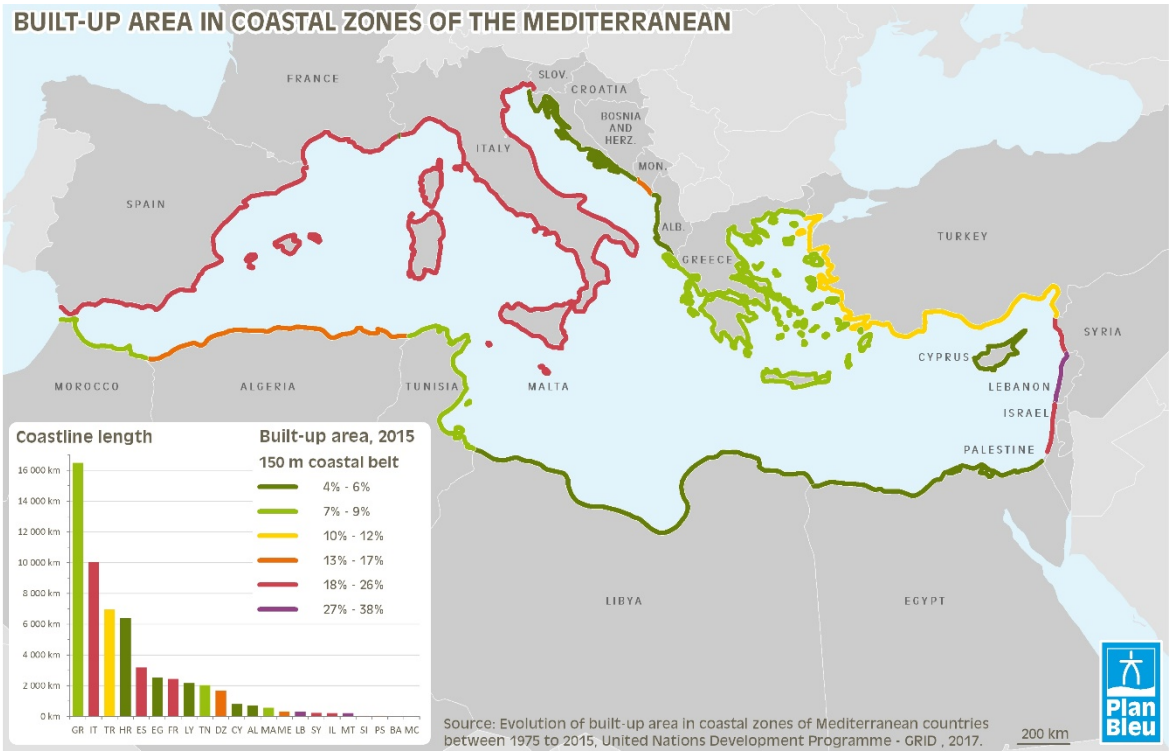


Figure 12: Built-up area in coastal zones of the Mediterranean countries (% within 150 m coastal belt)

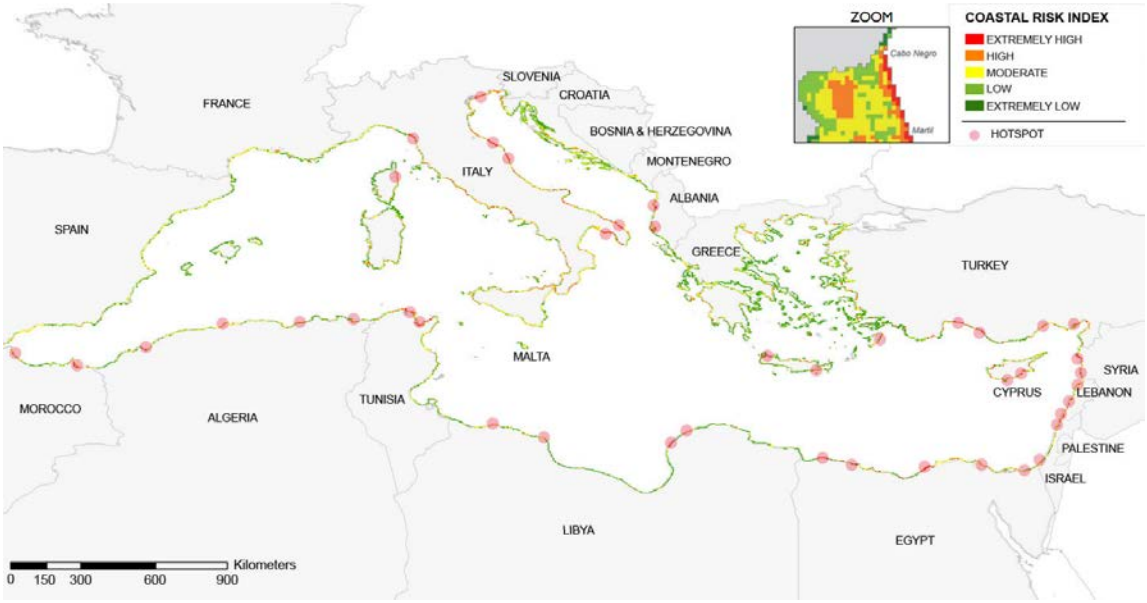


Figure 13: Regional risk assessment map for the Mediterranean based on the CRI-Med method (Source: Satta et al., 2016)

[108] Data for the 100 m belt not available.

39. The increasing attractiveness of coastal regions and cities comes with a decline in rural economic and population dynamics. Whereas in NMC, rural exodus is a long-standing reality, it is much more recent in SEMC, inversing population distribution to less than 50% of national populations living in rural areas in all but two Mediterranean countries today. Socio-economic disparities between the rural and urban areas continue to persist with generally poorer rural areas and more challenging access to basic services and infrastructure in rural areas.

40. Recently, new activities such as renewable marine energies or the extraction of marine minerals and organisms emerge and co-exist with other maritime activities such as offshore oil and gas, maritime transport and with Marine Protected Areas. This multiplication and intensification of maritime uses represents new challenges for achieving or maintaining Good Environmental Status of the Mediterranean.

41. Integrated Coastal Zone Management (ICZM) and Marine Spatial Planning (MSP) offer coherent responses to current challenges that face Mediterranean coasts. The ICZM Protocol to the Barcelona Convention has been supplemented in 2017 by a “Common Regional Framework” to introduce MSP into the delivery of the ICZM Protocol. Both ICZM and MSP deal with land-sea interactions and address conflicts between human uses and coastal and marine ecosystems and advocate for coherent policy mixes. Avoiding further degradation of Mediterranean coastal zones and where possible restoration of ecosystems require urgent implementation, enforcement and follow-up of these tools.

VI. Food and water security

42. Renewable water resources in the Mediterranean basin are concentrated mainly in northern countries (67%). In 2015, nearly 220 million people were in water scarcity or stress situations in the Mediterranean countries, mainly in SEMC. Water scarcity has led to unsustainable consumption and over-abstraction of surface and groundwater resources, which contributed to further water shortages. Aquifers are being over-exploited, leading to groundwater pollution and seawater intrusion in coastal areas. Irrigated agriculture is the most water-demanding sector (55% of the total), followed by the energy and domestic sector, urban and rural drinking water supply, and touristic activities. Water demand varies significantly throughout the year and locally, and peaks in summer especially for irrigation and tourism. Total water consumption lays well below the total available resources in the NMC, while in the SEMC it exceeds available water resources. By 2050, water demands are projected to double or even triple, driven by population and economic growth, expansion of irrigated areas, and increasing crop water needs resulting from warmer and drier conditions. Water use efficiency is particularly low in agriculture, due to water losses that call for the modernization of irrigation systems. About 10 million people, corresponding to 2% of total Mediterranean population, do not have access to safe drinking water or sanitation, mostly in the south-east areas, although significant improvements have been made.

43. Food security is granted when people constantly have physical and economic access to enough food, which is healthy and nutritious and allows them to satisfy their energy needs and their food preferences, while leading a healthy and active life. Food production in the Mediterranean countries exceeds consumption in fruits and vegetables, wine, and olive oil, while being chronically deficient in cereals. This deficit is essentially due to agroclimatic conditions and to the generally low availability of both water and arable land. The intrinsic limitation of natural resources and current rates of population growth, especially in the south and east, lead to an increase in the dependence on food imports. Projections indicate that this situation will worsen in the coming decades, mainly under the pressure of climate change and population growth. Current statistics show that access to food is generally lower in rural areas, due to physical (e.g. absence of infrastructures and markets) or economic (e.g. low purchase power, rising prices) reasons, making the rural population particularly vulnerable. Food habits are gradually changing in the last decades, with the abandonment of the traditional Mediterranean diet, towards a “western” nutrition style rich in proteins, fats, and refined cereals. Food security has been improved in the Mediterranean countries, often at the expenses of

nutritional quality, of locally-produced, seasonal and diverse food, and of traditional conservation know-how. These changes have growing environmental, economic, and human health impacts, including biodiversity loss and food waste, an even higher dependence on cereal imports, a higher vulnerability to the volatility of international prices, as well as phenomena of both under- (e.g. anemia) and over-nourishment. In the period 2012 to 2016, obesity shows a rising trend, with an obesity rate above 20% in almost all Mediterranean countries and peaks of more than 30% in Egypt, Lebanon, Libya, Malta and Turkey in 2016.

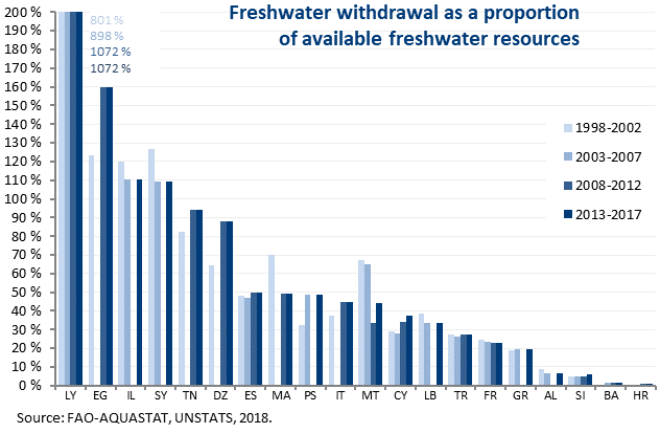


Figure 14: Freshwater withdrawal as a proportion of available freshwater resources, 1998-2017 (Source: FAO-AQUASTAT, UNSTATS, 2018)

44. Overexploitation of resources (water, soil) put increasing pressures on food and water availability. Land use changes and intensification of the agriculture in response to population growth (particularly in the south) or access to subsidies (EU countries) increase soil erosion, which affects agricultural productivity and increases pollution and eutrophication, with higher risks of flash floods, and reservoirs siltation. Soil pollution is mainly linked to the use of fertilizers and pesticides, used increasingly in the Mediterranean region, posing at the same time threats to human and environmental health through diffuse water pollution, animal death, and soil contamination. Climate change will amplify most of these pressures and impacts on the availability, quality, stability of and access to water and food, thus further threatening water and food security. Ensuring water and food security for Mediterranean populations is key for their sustainable development and requires an integrated approach that considers the interdependencies between the uses of resources.

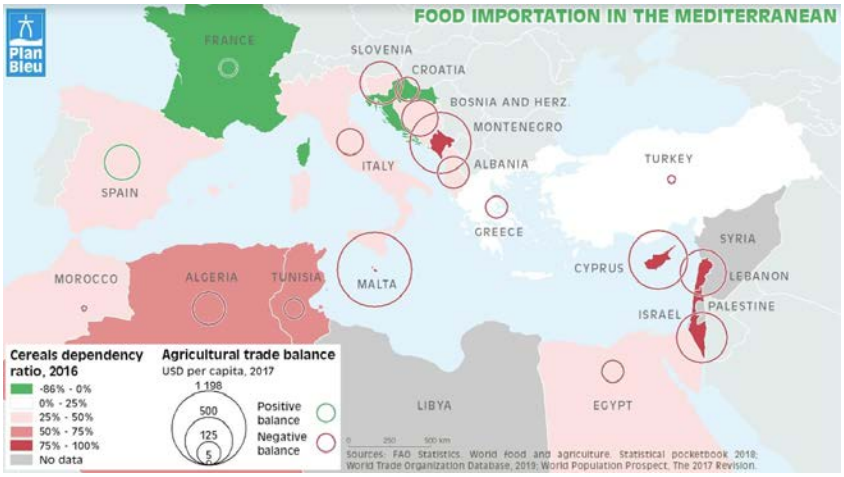


Figure 15: Cereals dependency ratio, 2018 and Agricultural trade balance in USD per capita, 2017 (Source: FAO 2018)

VII. Environment and health

45. The deep and complex relation between environmental conditions and human health is recognized by the international community as a pressing issue of emerging concern. In Mediterranean countries, 15% of deaths are attributed to modifiable environmental factors, compared to 23% worldwide, and ranging between 8% and 27% across countries in 2012. Major risks to human health derive from ambient air pollution and some remaining inadequate drinking water quality and sanitation services. Climate change is expected to exacerbate risks for human health: the expected increase of air temperatures, including a raise in the frequency and intensity of heat waves, can seriously affect the health of the most vulnerable population groups, including the elderly in an aging population. There is high certainty that the recent observed climatic trends will contribute to the future transmission of vector-, food-, and water-borne diseases. Areas with elevated probability for West Nile infections, linked to climate change, will likely expand and eventually include most of the Mediterranean countries. Extreme events, like floods, may lead to the spread of water-borne and vector-borne (e.g. mosquitoes) infectious diseases. Floods also cause personal injuries, enteric infections, increase mental health problems, and lead to potential contamination by toxic chemicals. An increase of allergies is also expected, due to the modifications in the geographic distribution range of some plant species, the extension of the pollen season, and an increased production of pollen. The intrusion of saltwater into groundwater, caused by sea level rise, may deprive parts of the population of drinking water and increase the saline content of drinking water sources, which in turn may have serious health consequences.

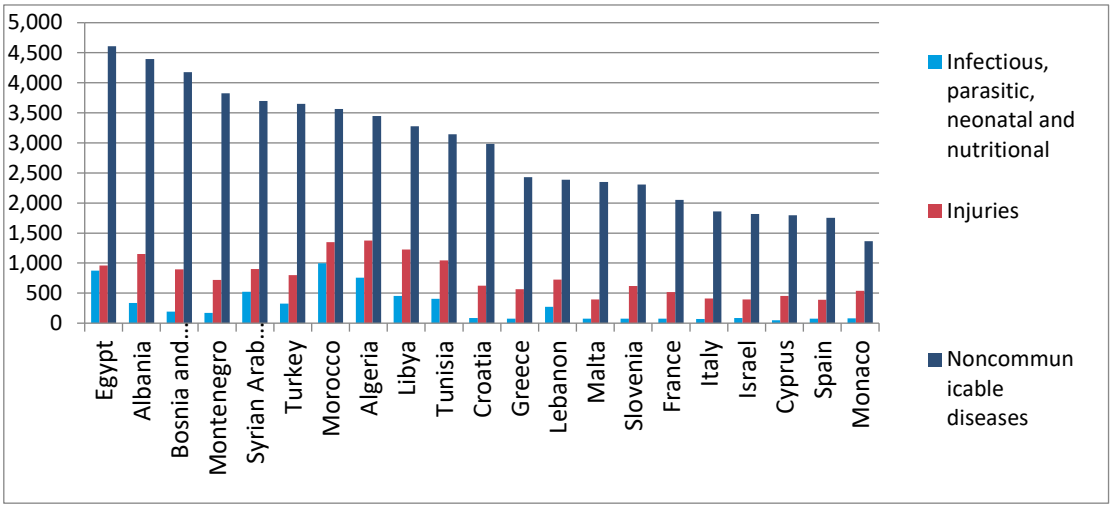


Figure 16: Age-standardized disability adjusted life years (DALYs) attributable to the environment per 100,000 population in 2012 (Source: WHO, 2019)

46. In Mediterranean countries, it is estimated that more than 228,000 persons died prematurely in 2016 because of exposure to ambient air pollution. Pollutants with the strongest evidence for public health concern include particulate matter (PM), ozone (O3), nitrogen dioxide (NO2) and sulphur dioxide (SO2), most of which stemming from transport and other fuel consumption. Air pollution has a high cost for countries, the World Bank estimated the welfare losses due to PM2.5, derived from transport, at 2.3% of GDP in the MENA region and 7.4% in Europe and Central Asia. Especially dangerous is the case of Egypt where more than 85% of the population is exposed to ambient pollution beyond the WHO threshold[109]. NMC generally show lower exposure levels, with between

[109] Natural sources of air pollution (desert dust and sea salt) are very active in SEMC. Unfortunately, not much source apportionment studies were done in these countries. The WHO data base of sources apportionment studies indicates that more than 50% of PM10 and PM 2.5 are coming from natural resources, which is a very

25% and 42% of population exposed. The general trend in NMC keeps relatively constant, with exposure to particulate matter decreasing only slightly after a peak in 2011, whereas in SEMC, particulate matter exposure has increased, except in Israel where the situation has improved slightly.

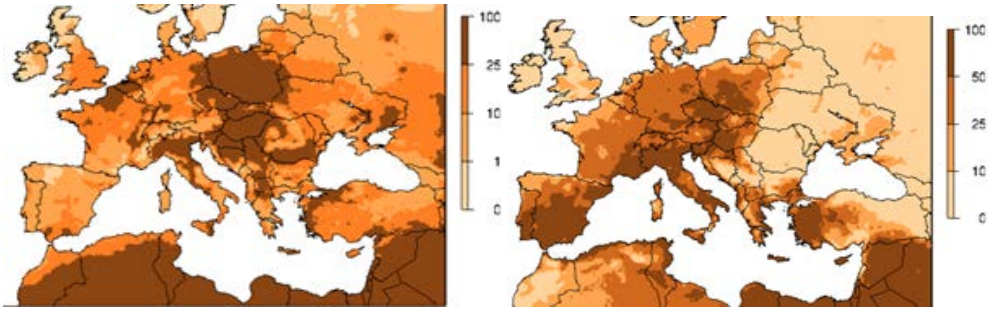


Figure 17: Left – Number of days when WHO recommended threshold of exposure to 25 μg/m3 of particulate matter (PM2,5) was exceeded in 2016. Right - Number of days when WHO recommended threshold of exposure to ozone of 100 μg/m3 was exceeded in 2016 (Source: Copernicus Atmosphere, European Commission, 2019)

47. Man-made and natural disaster risks and emergencies are a reality in the Mediterranean region and have the potential to temporarily or permanently alter the inhabitants' access to safe environmental infrastructure and services. The Mediterranean is an area of relatively high seismic and volcanic activity with a series of destructive earthquakes, volcanic eruptions and tsunamis on record, having displaced and killed thousands of Mediterranean inhabitants. In addition, man-made emergencies linked to political turbulence and war force large numbers of people to flee these situations and find new, often improvised, housing and means of living including water and sanitation services. Providing healthy environments for people is thus a particular challenge. Forced displacement of people can also cause environmental degradation, not only in the (destroyed) areas left behind but also in the areas that receive massive population flows. Emergency and preparedness plans, integrating health and environment considerations are key to disaster management in order to protect the health of humans and ecosystems.

48. Human health and well-being are influenced by goods and services provided by Mediterranean ecosystems. The relationship between human health and natural ecosystems is receiving increasing attention by researchers. In marine areas, overfishing and sea warming contribute to the depletion of some fish stocks, while microbial and chemical contamination, and toxins from harmful algal blooms threaten the quality of seafood, which is an important component of the Mediterranean diet. Human activities such as bottom trawling, and microbial and chemical contamination, threaten the Mediterranean marine organisms that furnish bioactive substances, which are used to develop new drugs to treat major human diseases, such as cancer. Contamination also negatively affects the recreational use of coastal and marine waters, and their capacity to provide benefits to users. Thus, there is a need to safeguard the goods and services provided by the Mediterranean marine ecosystem in order to enhance health benefits and minimize health risks. Researchers, policymakers, healthcare providers and public health practitioners, and the public should further address the interactions and the value of Mediterranean ecosystems for human health and wellbeing.

VIII. Governance

49. The United Nations Convention on the Law of the Sea (UNCLOS, adopted in 1982) requires countries sharing an enclosed or semi-enclosed sea to cooperate with each other to coordinate the

important issue when talking about air quality management and when dealing with perceptions that natural air pollution is not as poisonous as pollution coming from other sources.

management, conservation, exploration, and exploitation of the living resources of the sea, and to protect and preserve the marine environment. Several agreements are in place in the Mediterranean region to protect the coastal and marine environment. The most important is the Convention for the Protection of the Mediterranean Sea against Pollution (the Barcelona Convention), signed in 1976 and revised in 1995 (Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean), administrated by UNEP, aiming to prevent, abate, combat and, to the fullest extent possible, eliminate pollution of the Sea, and to protect and enhance the marine and coastal environment so as to contribute to its sustainable development. Seven Protocols to the Convention are in place, covering aspects such as the protection of the sea against pollution from both land- and sea-based sources (including from hazardous waste, and from the exploration and exploitation of the continental shelf), for fostering cooperation in preventing and combating pollution from ships, promoting Specially Protected Areas and Integrated Coastal Zone Management (ICZM).

50. The Mediterranean Commission on Sustainable Development (MCSD) is a multi-stakeholder advisory body established in 1995. It assists countries in integrating environmental issues into socio-economic programmes and promotes sustainable development, giving a strong voice to all actors that work towards sustainability in the Mediterranean region. Other regional initiatives address environmental governance, including the Union for the Mediterranean (UfM), Union of Arab Maghreb, League of Arab States, Dialogue 5+5 (a framework for intergovernmental cooperation in the Western Mediterranean), etc.

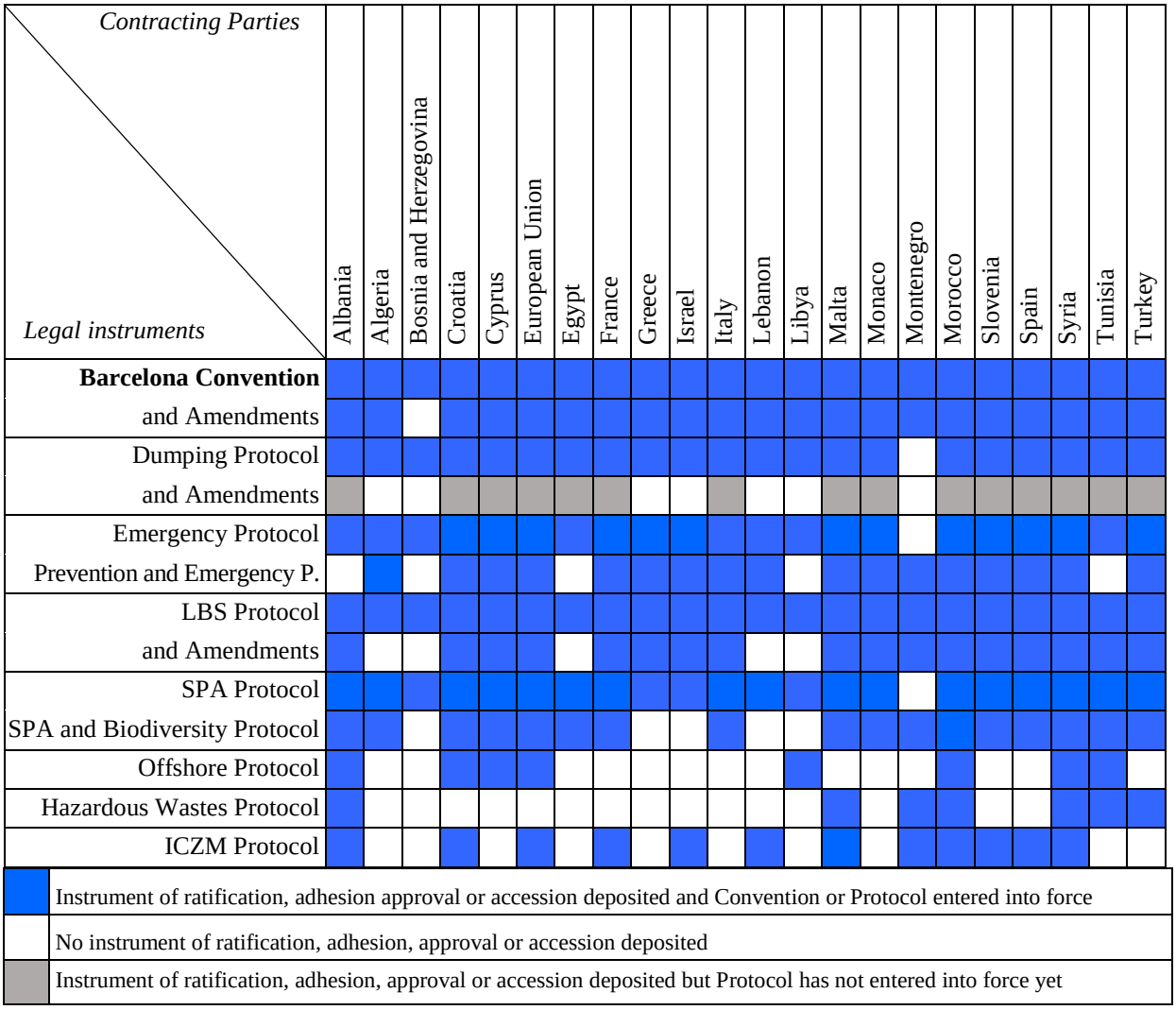


Figure 18: Ratification of Barcelona Convention and Protocols by the individual Contracting Parties.

51. The multiplication of governance frameworks on environment and sustainable development in the Mediterranean region calls to address sustainable development in an integrated way, along three main axes: the integration of regional governance among existing bodies; the integration of different governance levels, from regional to national and local; and, the integration of both land and marine governance. This is in line with the Mediterranean Strategy for Sustainable Development (MSSD), adopted in 2016 by the Contracting Parties to the Barcelona Convention, as a strategic guiding document for all stakeholders to translate the 2030 Agenda for Sustainable Development at the regional, sub-regional and national levels.

52. Local planning approaches and decentralization are at differing stages of implementation in Mediterranean countries. It is at the local scale that concrete action for conservation and management of natural resources for human wellbeing can be taken based on the best knowledge about specific local contexts. The challenge of adaptation to environmental and climate change particularly relies on local planning and implementation. The local translation and implementation of national and international agreements as well as the coordination between local administrations and decentralized sectoral technical services requires further capacity building and implementation support.

53. Public and stakeholder engagement is central in sustainable development planning. Mediterranean countries have established a set of commitments to apply participatory processes for policies such as Environmental Impact Assessment (EIA; all countries), Strategic Environmental Assessment (SEA; about three quarters of countries have SEA legislation in place), and Integrated Water Resource Management (IWRM), following the approach established in the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. Informed participation in decision-making leads to better decisions, enhancing public confidence in governmental decisions and, ultimately, contributing to achieve political stability and sustainable economic development. So far, 12 of the 22 Mediterranean countries are Parties of the Aarhus Convention. New opportunities for access to information and public participation in the environmental debate, are possible thanks to the strong increase of mobile phone subscriptions and people using the Internet and social media in Mediterranean countries.

54. Education, research, innovation, and capacity building are inherently interlinked and offer significant opportunities to develop Mediterranean natural and cultural assets, acting as drivers of economic and social development. There is an active North-South interface and a series of political and socio-economic driving forces, such as the capacity-building activities of the Mediterranean Action Plan (MAP), various EU-led initiatives, and the activities of the Union for the Mediterranean (UfM) for cooperation in higher education and research, including the Mediterranean Strategy on Education for Sustainable Development (MSESD), adopted in 2014 as the first of its kind in the world. These instruments should be further streamlined to address sustainable development issues and strengthen the capacity to develop ‘fit-for-purpose’ scientific information that can be communicated to decision-makers via effective science-policy interfaces.

IX. Synthesis of progress achieved, and persisting and remaining challenges

55. Throughout the last decade, significant progress in addressing sustainability issues in the Mediterranean has been achieved and the Barcelona Convention system has largely contributed to these achievements:

- Over the last ten years, Mediterranean countries have adopted global and regional common objectives and cooperation frameworks, setting a shared path towards sustainable development;

- Integration and system-based approaches are increasingly recognized as the most efficient way to address systemic factors, and combined pressures and impacts;

- Investments and collaborations have addressed and reduced some major pollution sources and health hazards;
- Common monitoring and assessment frameworks have been adopted to improve information-based decision-making; and
- The diffusion of stakeholder networks, inclusive approaches, and technological development have provided improved opportunities for stakeholder participation and engagement.

56. In spite of these efforts and innovations, major challenges persist and emerge:

- Despite achievements in designing and agreeing on common commitments, critical gaps remain in implementation and enforcement;
- The profile of environmental institutions and stakes remains to be raised for effective environmental integration;
- The passage from national and international engagements to concrete action at the local level remains challenging and requires further capacity building and support, while recognizing needs for local adaptations;
- The ambition of specific environmental regulations would gain to be upgraded; scientific evidence demonstrated in particular that declaring the Mediterranean an Emission Control Area would generate benefits largely overweighing costs;
- Adopting efficient policy mixes, upscaling the use of economic tools, land tenure instruments, stakeholder awareness and involvement remain areas of needed improvement. Efficient policy mixes are in particular a key condition to ensure a transition towards a blue, green and circular economy by scaling-up promising technical and social innovations, through a range of complementary funding mechanisms. Coordinated policy mixes are also required to efficiently prevent further land take and economic pressure on the coastal zone on both sides of the land sea interface as highlighted in the Common Regional ICZM framework to be adopted at COP 21;
- Further efforts are required for developing permanent collaboration frameworks across specialised stakeholder networks and governance fora;
- Specific funding is needed for environmental and economic transitions; investments will in particular be required to adapt to climate change and develop water efficiency and reuse in water scare areas. Sustainable management of biodiversity protected areas is dependent on sustainable funding mechanisms to cover recurrent management, surveillance and enforcement costs;
- The transformation of coastal and marine areas, activities and landscapes needs to be further anticipated in policies and actions.

57. In a transversal way, knowledge and understanding of all aspects of sustainability are key to support evidence-based action for transition. Ways to improve the effective use of knowledge include:

- Capitalising, i.e. gathering, analysing, transferring and disseminating existing knowledge, good practices, and local innovations;
- Conducting further research to communicate on the stakes of environmental degradation;
- Implementing, sustaining and expanding common monitoring frameworks; and

- Learning from experience by conducting ex-post evaluation of policies for more effective decisions.

X. Conclusions

58. Progress has been achieved throughout the last decade. Sustainable development policies, strategic frameworks and action plans have been developed and improved. Knowledge on ecosystems and their role for human wellbeing has increased. However, these elements of progress have not been sufficient to reduce pressures on and degradation of the Mediterranean coastal and marine environment. They have not allowed Mediterranean coastal populations to adapt to current and projected environmental and climate change and to increase their resilience. To reach commonly set goals and objectives such as achievement of Good Environmental Status of the Mediterranean coast and sea and more largely SDGs, and avoid projected failures, current trajectories must urgently be corrected. The transitions towards more sustainable pathways requires radical changes in behavior at all levels and in all areas, the main driver for increasing pressures and degradations being our production and consumption patterns.

59. Transitions are required in all production and consumption systems, and cannot be brought about by policy-makers alone. Changing development pathways is a shared responsibility of all stakeholders in the civil society, the private sector including banking and insurance, the scientific community, judicial systems, etc. Fostering participation and taking advantage of stakeholder mobilization to engage in dialogue and coordinated action will improve outcomes of policy-making at all levels. The current mobilization of youth for sustainable development must be seized as an opportunity for policy-makers to take into account long term goals, and translate them in short and medium term investments and reforms. Scientists are increasingly mobilized to produce policy relevant assessments and collaborate in organized science-policy interfaces such as IPCC, IPBES or, at the Mediterranean level, MedECC. Judicial systems increasingly deal with environmental and climate litigation and support the enforcement of sustainability regulations. The private sector’s powerful role in funding and inventing sustainable lifestyles is increasingly acknowledged.

60. The Barcelona Convention system can play a major role in fostering sustainability transitions. However, this requires an urgent step up from planning, engagement and local innovation, to wide-spread implementation on the ground and effective enforcement, in collaboration with local authorities and relevant stakeholders, including relevant private sector and funding agencies. Implementation and enforcement are lagging behind the ambition of commonly agreed objectives and measures, and risk discrediting their comprehensiveness and the major achievements in environmental diplomacy in the region. The imminent threat of severe and irreversible damage to ecosystems and subsequent human wellbeing calls for the urgent implementation and enforcement of agreed actions, capitalization, scaling-up and dissemination of a multitude of relevant innovations in a coherent approach, adequate monitoring and evaluation to ensure that measures are leading to the desired effects, and necessary adjustments when achievements fall behind.

Annex III

Revised Roadmap for the MED 2050 Foresight Study

Annex III: Revised Roadmap for the MED 2050 Foresight Study

Introduction

1. Since the late 1970's, Mediterranean countries have decided to cooperate to put "*at the disposal of political leaders and decision-makers all information that will enable them to develop plans likely to ensure sustained optimal socio-economic development without degrading the environment*" and help "*governments of coastal states in the Mediterranean region to increase their knowledge of the joint problems they have to face, both in the Mediterranean Sea and in their coastal areas*" (Inter-Governmental Meeting, UNEP/IG.5/7, 1977).

2. Within this context and in the framework of the implementation of article 4 of the Barcelona Convention and of the Mediterranean Strategy for Sustainable Development (MSSD), Plan Bleu/Regional Activity Centre (Plan Bleu) has been mandated with the "*preparation of analyses and prospective studies to assist in constructing visions of the future as an aid to decision-making*" and the "*dissemination of the findings of this work in the various appropriate forms and channels, including the regular publications of state of environment and development reports and environment and development outlook for the Mediterranean region*" (Decision IG.19/5, 2009).

3. Plan Bleu has coordinated and published two major foresight studies to date: "*Futures for the Mediterranean Basin: The Blue Plan*" (1989) and "*A sustainable future for the Mediterranean: The Blue Plan's Environment and Development Outlook*" (2005). Those reports have served as a reference to prepare environment and sustainable development policies in the Mediterranean, including the MSSD. They have supported regional, national and sectoral planning in various domains, and been cited hundreds of times. While they are now outdated and best used as historical references, decision-makers and experts continue to request Plan Bleu with information drawn from those reports given the lack of work fulfilling the same objectives.

4. The MAP Mid-Term Strategy (MTS) 2016-2021 reiterates the objective "*to deliver knowledge- based assessments of the Mediterranean environment and scenario development for informed decision-making and stakeholder work*" (Decision IG.22/1). To implement this decision, Contracting Parties to the Barcelona Convention included in the MAP Programme of Work and Budget 2016-2017 the development of "a roadmap for the preparation of MED 2050 report", as the Main Activity 1.4.1.3 (Decision IG.22/20).

5. To prepare such roadmap, Plan Bleu organized an expert workshop (December 2016), conducted a benchmark study on the strengths, weaknesses and gaps of 35 recent foresight studies in the Mediterranean region[110], and consulted with national representatives and experts. The Draft MED 2050 Roadmap was presented and discussed at the meeting of Plan Bleu Focal Points (April 2017), the 17th Meeting of the Mediterranean Commission on Sustainable Development (MCSD) (July 2017), the Meeting of the MAP Focal Points (September 2017) and the 20th Ordinary Meeting of the Contracting Parties (COP 20, Tirana, Albania, December 2017). The Contracting Parties welcomed this roadmap, adopted its Phase I, and requested the Secretariat (Plan Bleu) to present the progress of Phase I at COP 21 to enable them to provide guidance for Phase II (Decision IG.23/4). This involves preparing a revised roadmap for Phase II. The present document fulfils this objective.

I. MED 2050 Scoping and Key Directions

6. Preparatory activities (benchmark, expert workshops, and stakeholder consultations) established that a new foresight on environment and development was necessary in the Mediterranean region. The Mediterranean context has considerably evolved since MAP last foresight exercise published in 2005, with the Arab springs, acceleration of climate change, oil counter-shock, national, regional and global geopolitical upheavals, etc. The preparation of upcoming strategic documents, including the new MAP Medium term strategy and MSSD revision require a new vision for the

[110] http://planbleu.org/en/publications/to-a-new-prospective-exercise-on-the-environment- and-the-developments-in

future. The coming decades will be decisive for resolving environmental problems, seizing emerging opportunities and paving the way for a prosperous and peaceful Mediterranean region, in which people enjoy a good quality of life and where sustainable development takes place within carrying capacities of healthy ecosystems. MED 2050 will shed light on these critical objectives.

7. Preparatory activities for MED 2050 also provided insight on how this exercise should be shaped to fill gaps and facilitate decision-making in the next decade, while building on existing knowledge and resources. MED 2050 has thus been designed along the following key directions:

- A 2050 horizon - with an intermediate horizon at 2030 (corresponding to the SDGs). A 2050 perspective allows to consider long term issues, such as climate change, possible ecosystem disruptions and their economic and social outcomes (consequences on agriculture, fisheries, lifestyles, migrations, urbanization, energy policies, etc.), and to identify necessary transitions.

- In line with Barcelona Convention and MAP concerns, the sea and maritime economy are put upstream of the thought process, in a systemic framework.

- MED 2050 adopts a participatory approach, to support the documentation of contrasting visions of the Mediterranean future. It will acknowledge that countries and stakeholders start from different situations and viewpoints, and help co-construct shared objectives in the medium and long term.

- A balance between quantitative and qualitative approaches, combining use of existing trend information with a more qualitative analysis of disruptions and weak signals.

- Beyond forward anticipation (forecasting), MED 2050 will use a strategic approach, consider contrasting scenarios, and identify transition paths (backcasting).

- A stronger investment in communication. MED 2050 results, even at intermediate stages, will be made accessible to the different interested publics – from specialists to citizens.

8. The proposed revised roadmap is organized around four main activity modules: Module 1: Trends, ruptures and weak signals; Module 2: Comparing and sharing contrasting visions; Module 3: Designing scenarios; Module 4: Co-constructing transition strategies. Scientists and MAP experts are already or will be associated to all modules. A graph summarizing these components is presented in Appendix 1. A provisional schedule is in Appendix 2.

9. Phase I of MED 2050, carried out during the biennium 2018–2019, included start-up activities (mobilizing existing resources, creating a network and designing a participation strategy), and Module 1 on the evaluation of trends, disruptors and weak signals. Phase II of MED 2050 corresponds to the activities planned during the biennium 2020–2021 (Modules 2 to 5 below, detailed in Appendix 4).

II. Start-Up Activities: Mobilizing existing resources and building a network on Mediterranean futures (Phase I: 2018–2019)

10. **Consultation**. The Secretariat (Plan Bleu) consulted various Mediterranean stakeholders (Plan Bleu and MAP Focal Points, MCSD Members, MAP Partners, experts, etc.), to identify national experiences, expectations, and interested parties to participate in MED 2050 or to support regional, sub-regional or national workshops.

11. In April 2018, a brainstorming workshop was held in Plan Bleu, to frame the operationalization of MED 2050.

12. In June 2018, Plan Bleu organized an International Conference entitled “Environment and development in the Mediterranean, yesterday, today, tomorrow”, co-organized with Serge Antoine Foundation, which brought together more than 130 participants, experts and policymakers from Mediterranean countries, representatives of MAP components, national, European and international institutions, and members of the civil society. Major trends in the Mediterranean were presented and discussed, with MED 2050 objectives at the centre of the discussions.

13. Exchanges and relations with several thematic networks were established in 2018-2019, notably on the themes of the sea, the rural environment and agriculture, and demography. Contacts were also established with the network PROSPER (foresight managers for French public research). Contacts with foresight entities in other Mediterranean countries are ongoing with support from Plan Bleu Focal Points and MCSD members. Interviews are conducted to consolidate collaborations.

14. **Project organization**. MED 2050 relies on five complementary groups (Appendix 3):

- **Plan Bleu team** implements MED 2050, in close collaboration with other MAP entities. **MAP components** provide critical expertise and facilitate synergies with other MAP exercises.

- The **scientific committee** will be in charge of ensuring the scientific coherence of the project results. Its members, recognized experts, will only meet on few occasions.

- The **foresight group** will have a fundamental production role throughout the project.

- Ad hoc groups will be assembled for **specific workshops**, in particular to collect and discuss contrasting visions.

- The wider **MED 2050 foresight network** is at the heart of information exchange on the main results, analyses, points of view and questions, using in particular the web platform dedicated to MED 2050 (Box 1). Designed as a dynamic science-policy interface, the network facilitates the mobilization of existing resources, dialogue among stakeholders, and the uptake of research results in policy development. Participation in the network is open and may evolve throughout the project depending on the development of themes and interests. Many stakeholders expressed great interest in being involved to varying degrees in MED 2050 foresight network. Institutions and experts involved in recent and ongoing foresight studies in the Mediterranean, as well as relevant scientific networks and institutions were invited to participate in the network. MAP and Plan Bleu Focal Points were invited to participate and identify national participants and representatives. The network remains to be completed in the South and East of the Basin.

Box 1: The MED 2050 web platform, a strategic tool for thinking about the future of the Mediterranean Basin

The web platform dedicated to MED 2050 was created in June 2018. It will be further developed as the project advances. The platform is a place of experience and documents sharing (studies, events, written documents or videos...) to feed the reflection on the future of the Mediterranean basin by 2050. Once further developed, the MED 2050 platform will include:

- A space dedicated to the MED 2050 initiative, with an introductory page on the project, its objectives, the successive modules, links to one or more specific consultation platforms, in particular to feed Module 2 on contrasting visions, and a more general work area with the possibility of posting comments, opinions, and ideas… This last section will not function as an open blog; to minimize moderation needs, comments and contributions will only be received by the coordination team not made publicly visible.

- A space dedicated to foresight works at national and regional levels;

- A space dedicated to foresight tools and their use, with a page on *Imagine* and *Climagine* local participatory foresight methods, examples of concrete cases using these methods, etc.

15. **Participatory approach**. MAP Phase II, adopted in 1995, states that "*information and public participation are essential dimensions of sustainable development and environmental protection*". At its 17th Meeting (Athens, Greece, 4-5 July 2017), the MCSD also called for greater attention to participatory approaches involving broader stakeholder consultations, including through the use of electronic tools (web platforms), in addition to the involvement of national governments. MED 2050 will therefore rely on an innovative and efficient participation strategy, making the initiative open and collaborative. As recommended by Plan Bleu Focal Point (Marseille, France, 28-29 May 2019), participation methods will give a specific place to youth representatives throughout the exercise.

16. **Newsletter.** A newsletter will be made available on the web platform. This newsletter will not focus solely on scientific results. It will leave room for questions, sharing of national, regional or international experiences, information on current projects, debate on future options and scenarios. Successive articles on the same subject could be grouped and synthesized to produce thematic booklets. These intermediate products will contribute to the preparation of the final report, and support the communication strategy by targeting a broader audience than the final report.

17. **Calendar**. The capitalization, consultation and setting up of the network have required particular attention in 2018–2019. Those activities will be continued during the biennium 2020–2021, to take advantage of new developments and ensure ongoing dialogue among interested parties. Intermediary outputs will be presented to the various bodies of the MAP system.

III. Module 1: Assessing trends, disruptors and weak signals in a new Mediterranean context (Phase 1: 2018–2019)

18. MED 2050 Module 1 focuses on describing major trends (both qualitative and quantitative), identifying and analysing disruptions and weak signals. Module 1 implementation is underway with a synthesis report expected by the end of the 2018-2019 biennium.

19. To ensure efficient use of resources, Module 1 takes advantage of synergies with ongoing MAP and non-MAP work, including the Report on the State of the Environment and Development in the Mediterranean 2019 in development (SoED 2019), the Shared Environmental Information System (SEIS), the Integrated Monitoring and Assessment Program (IMAP), the Mediterranean Sustainability Dashboard, the MedECC first assessment report, etc.

20. Module 1 includes the development of a long-series database to compare trends described in the previous MAP foresight report (2005) and trends actually observed. The 2019 Report on the State of the Environment and Development in the Mediterranean (SoED 2019) takes stock of environment and development trends in the Mediterranean. Its publication is planned for early 2020, and is the result of a collective effort of the Contracting Parties, MAP components, and external partners. The assessment report being prepared by the MedECC expert network on climate and environmental change in the Mediterranean will also be an essential contribution to MED 2050 Module 1.

21. To develop Module 1, Plan Bleu has formed a partnership with Labex Med, a programme of excellence for the promotion of interdisciplinary research in human and social sciences in the Mediterranean. This partnership is an important opportunity to collaborate with research laboratories, create synergies, and base MED 2050 on a scientifically recognized work, including in its interdisciplinary approach. This partnership gives the opportunity to a postdoctoral researcher to work for one year in Plan Bleu, to go beyond disjoint sectoral or institutional analyses and understand the structuring trends in a systemic framework, ensuring the coherence of hypotheses and putting forward interactions and interdependencies between thematic analyses. The results of this work will be presented for discussion to the foresight group, and will lead to the production of a first MED 2050 product: report on trends, disruptions and weak signals, by the end of 2019.

IV. Module 2: Sharing and comparing contrasting visions across the Mediterranean (Phase II: 2020–2021)

22. Unlike most analyses identified in the benchmark study, MED 2050 will not rely solely on expert work. Contracting Parties and stakeholders will be consulted on their visions for the future of the Mediterranean (their viewpoints and aspirations), with the aim of sharing potentially contrasting visions across Mediterranean sub-regions.

23. Two options are envisaged for Module 2 implementation, depending on resources:

- Option 1: remote consultation of national and local experts and decision-makers, on their visions of the future of the Mediterranean. This option would allow to collect contrasting visions, using reliable foresight consultation methods, although not reaching all the relevant stakeholders and not allowing for a real dialogue among them.

- Option 2: National and Sub-regional Workshops. Several foresight workshops would be organized in selected sub-regions to engage stakeholders (experts, policymakers, civil society) on their visions for the future of the Mediterranean basin. These workshops could be organized around the following points: discussion in working groups on the results of Module 1 (trends, disruptions, and weak signals), joint foresight exercises allowing for the emergence of contrasting visions of the future, then sharing and consolidating these visions. This option would make it possible to reveal the specificities of sub-regional visions in the Mediterranean region.

24. Under both options, Module 2 can be opened to a wider consultation relayed by network leaders. Questionnaires will be prepared, disseminated and analysed, using recognized foresight methods, through partnerships with existing network leaders and representative of the main stakeholders and issues in the Mediterranean region, including interested MCSD Members.

25. Special attention will be given, in this context, to the sea, if possible through a specific workshop. Foresight experts and specialists of the marine environment would on this occasion be brought together to work and bring out contrasting visions of the future of the Mediterranean Sea.

V. Module 3: Reconciling trends, disruptors and weak signals, and contrasting visions to identify a preferred yet realistic scenario (Phase II: 2020–2021)

26. Under MED 2050 Module 3, the foresight group will be responsible for articulating the results of Modules 1 and 2. Taking into account the different viewpoints of countries, sub-regions and stakeholders, the foresight group will identify common or convergent objectives, and build several contrasting scenarios. As recommended by Plan Bleu Focal Points, this module will consider disruptive scenarios compatible with a sustainability transition. One of the scenarios, identified as the most realistic and desirable (consensual), will serve as a reference (target situation) to develop Module 4 on transition paths.

VI. Module 4: Co-creating transition pathways and strategies in the short, medium and long term (Phase III: 2020–2021)

27. The central question to which the prospective must be able to answer is not what will be the future in 2050, but that of transitions: how to move from current situations and crises to medium-term action plans and long-term objectives? In their 2019 meeting, Plan Bleu Focal Points encouraged the MAP system to pursue ambitious yet realistic transition objectives (Marseille, France, 28-29 May) MED 2050 Module 4 corresponds thus to a strategic foresight activity to co-design transition paths rooted in reality and operational. Module 4 will help identify major obstacles and early responses when they are still achievable as well as opportunities to achieve a desirable future. It will help anticipate emergencies, avoid repair costs and maximize co-benefits.

28. Transition paths will take into account the different temporalities. Agreeing on desirable or acceptable futures by 2050 (long-term) will make it possible to identify alternative transition strategies in the medium term (horizon 2030) and to make comparative assessments of their plausibility, as well as to put forward critical investments.

29. MED 2050 will take into account sub-regional heterogeneity. MED 2050 thus directly intends to feed into future strategies and agendas, including national and sectoral plans.

VII. Mobilization of financial resources

30. A set of core activities – sufficient to produce the MED 2050 report for COP 22 – will rely solely on technical partnerships, MTF funding and limited co-financing, as proposed in the 2018-2019 and 2020-2021 MAP Programmes of Work. The Secretariat through Plan Bleu applied for interdisciplinary research funding, with contrasting success. The necessary co-financing for the first biennium has been mobilized. Additional or more ambitious activities require the mobilization of additional co-financing or complementary partnerships. Although not selected at the final stage, an ambitious interdisciplinary project was for example preselected to the final stage of a H2020 funding,

and could serve as a basis for another proposal. Other funding opportunities are under discussion but remain to be completed.

31. The organization of MED 2050 into modules and packages of activities will help find additional funds associated with explicit activities and products. For example, development or investment banks (World Bank, European Investment Bank, African Development Bank, French Development Agency, etc.) could be interested in obtaining benchmarks to design future investment strategies, by financing activities targeting transition trajectories and critical investments in different parts of the Mediterranean basin. Several preliminary contacts have been established. Presenting the first MED 2050 products should facilitate resource mobilization for the second Phase.

32. Funding by the MTF and the official support from the Contracting Parties will allow for the establishment of required co-financing and partnerships, while ensuring that MED 2050 products will feed into the specific objective of the MAP Mid-Term Strategy 2016-2021.

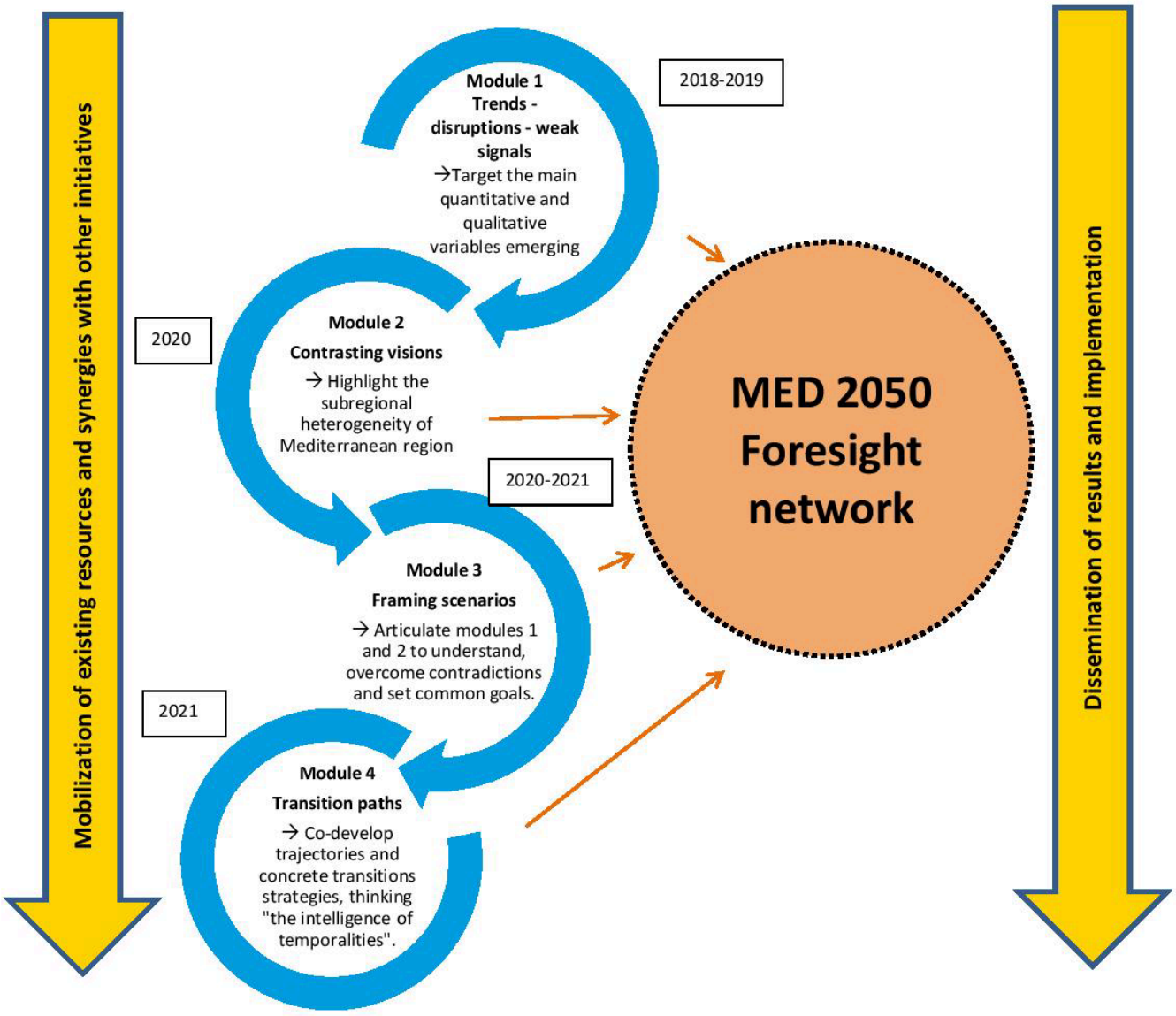
VIII. Expected outputs: dissemination of results, knowledge- and capacity building

33. The chapters of MED 2050 report will be delivered in stages, with a chapter on trends in 2019, a chapter on visions in 2020 and a chapter on transition pathways and critical investments in 2021. The final report will be discussed by MAP system bodies in 2021 with a view to being presented to COP 22 in 2021. The web platform will also be mobilized as a strategic tool to disseminate MED 2050 results, through newsletters and thematic leaflets among other products.

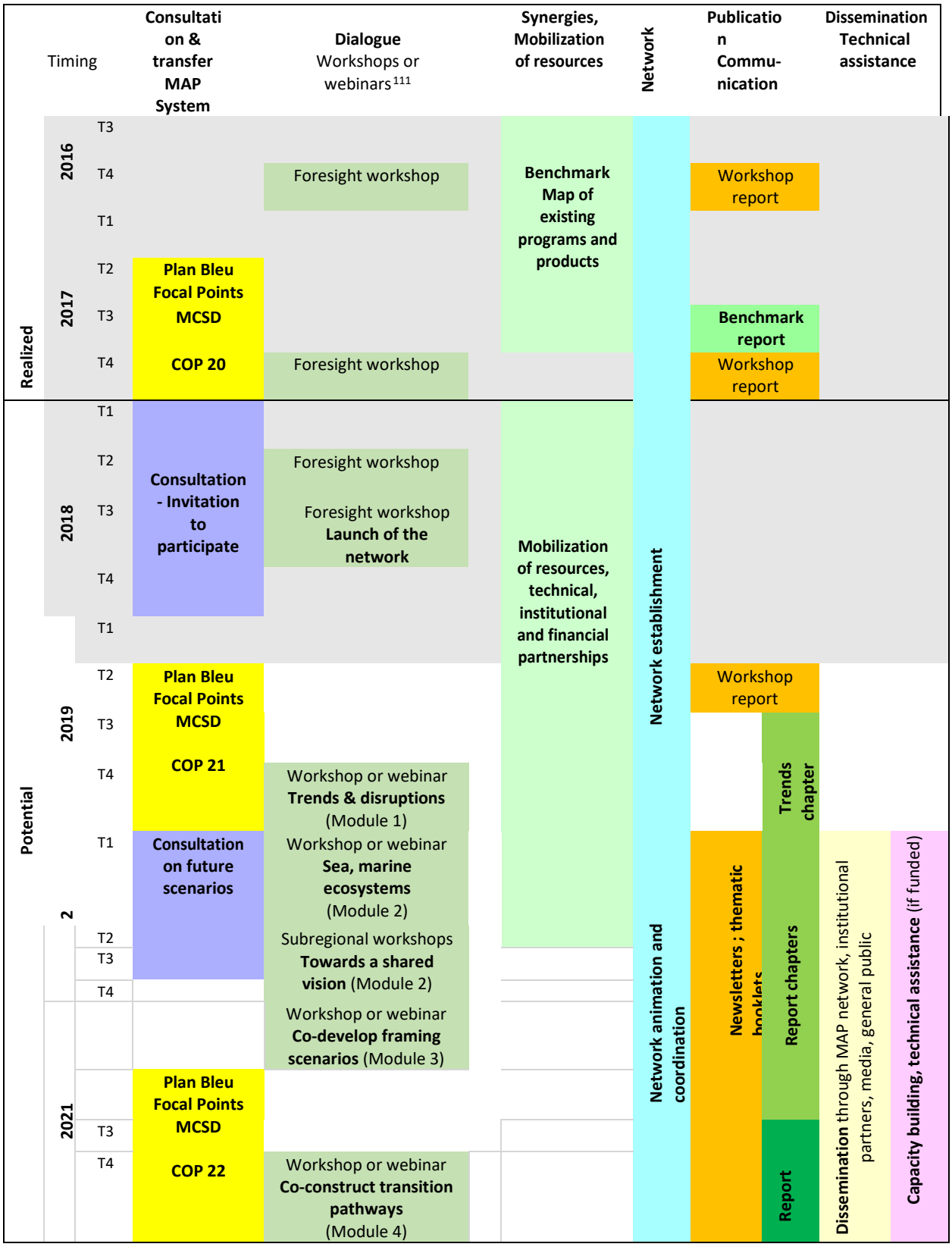
34. MED 2050 will thus contribute to the visibility of the MAP – Barcelona Convention system. Plan Bleu Focal Points (Marseille, France, 28-29 May 2019), and MCSD members (Budva, Montenegro, 11-13 June) emphasized the importance of developing communication products adapted to a wide audience, including youth.

35. Pending the identification of additional targeted funding, Plan Bleu could also support interested Contracting Parties in developing national or sub-regional MED 2050 declinations, by presenting MED 2050 results locally or providing technical assistance to integrate those results into foresight studies, strategies and action plans at the sub-regional, national and local levels. Plan Bleu could produce a methodological guide to share experience and good practices. The methodological approach, aiming to bring together Mediterranean initiatives, could be applied on different scales within the Mediterranean and beyond, and could attract and nurture initiatives in other regional seas.

Appendix 1: Proposed components for MED 2050



Appendix 2: Provisional timetable for MED 2050



[111] Subject to corresponding financial mobilization.

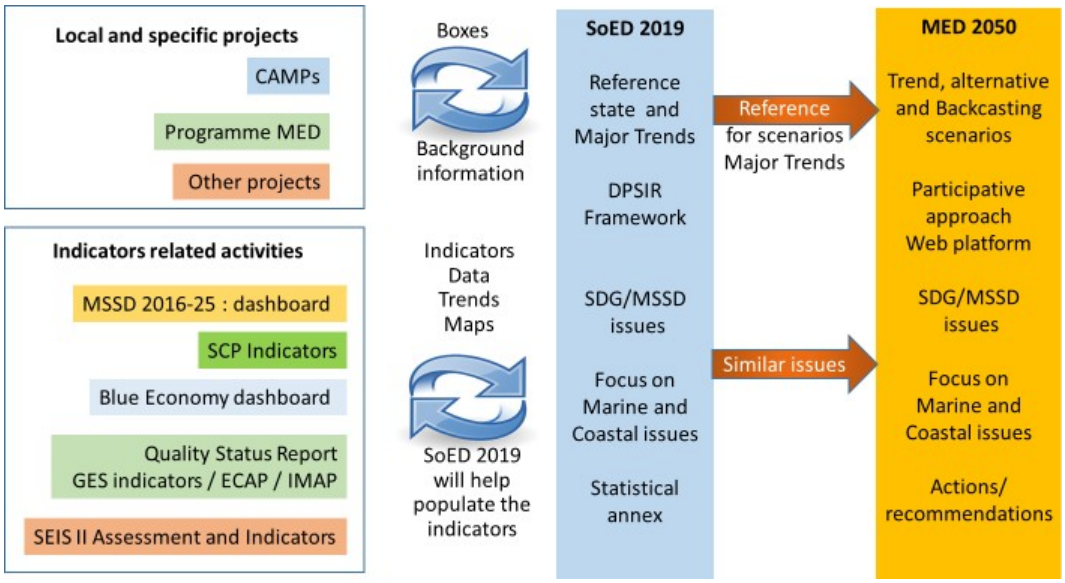
Appendix 3: Establishment of MED 2050 network

	Composition	Role	Frequency of meetings	Intervention stage
Plan Bleu team	MED 2050 team and MAP partners	MED 2050 **animation**	Regular	All along the project
Scientific committee	About 15 people Legitimacy Representativeness	**Scientific validation** MED 2050 « moral and scientific guarantee »	Twice (upstream of the project, and downstream for validation of work / results)	Upstream of Module 1 At the end of Module 4
Foresight group	15-20 people mobilized: Minimum 1/3 with foresight experience and 2/3 of thematic experts and other stakeholders, including PLAN BLEU and other RAC. Representativeness	**Production** role	Regular	All along the project Above all: Module 3 // framing scenarios
Specific workshops	« Decentralization » of the foresight group *(Composition : experts and representative groups → depending of financial means)*	Bring out contrasting visions Start from countries situations A focus workshop on the sea, if financial means	Workshops 2/3 days per sub-region or 2 times 2/3 days (Or contrasting visions of national experts, depending on the means)	Module 2 // contrasting visions
Expanded network	Informal network. Representativeness (countries, organisms)	**Exchange of information / consultation / resource center / ability to post documents / strategic watch**	Active continuously via the platform (to be developed on the new website) One-off consultations	One-off consultations // Module 2 All along the project and after (strategic watch // newsletters // thematic booklets // exchange of information)

Appendix 4: Modules, participation strategy and methodological elements

	Modules	Who participates in this step?	Methodological elements
1	**Trends – disruptions – weak signals**	RED 2019 team MedECC network **Post-doc, in partnership with LabexMed.** Plan Bleu team and MAP **Foresight group** Expanded network	**Post-doctorate**: trend analysis in connection with the PLAN BLEU team, and more qualitative work on disruptions and weak signals **Foresight group**: first meeting in November 2019 to work in groups on this module
2	**Contrasting visions**	Workgroups in **specific workshops (decentralized foresight groups)** *(ou just experts if lack of financial means)* Plan Bleu team and MAP partners **Expanded network**, especially by using a relay through partner network heads // one-off consultations	Hypothesis 1: **remote consultation of national and local experts and decision makers** to bring their visions of the future of the basin Hypothesis 2: **National and Subregional Workshops** Whatever the hypothesis adopted: **wider consultation** relayed by network heads, and, depending on the budget, specialized **workshop on sea foresight**
3	**Framing scenarios**	**Foresight group** Plan Bleu team and MAP partners Expanded network	The foresight group articulates results of Modules 1 and 2 in order to take into account the differences of points of view and aspirations, to build **several contrasted scenarios** and to retain the most realistic and desirable one
4	**Transition paths**	**Foresight group with increased participation of actors** (institutional, associations, civil society, donors) Plan Bleu team and MAP partners Expanded network	The foresight group and the actors participating in this module **prioritize obstacles, favorable factors, opportunities and risks to be overcome** in order to reach the shared objectives, and to **build concrete and realistic paths of transition** (including investments and critical policy measures)
All	**Dissemination of results and implementation**	**Plan Bleu team and MAP partners** **Foresight Group** **Expanded network**	Key role of **MED 2050 web platform** throughout the project: place of exchange, sharing of practices and experiences, information mutualization etc. One of the potential final outputs: methodological guide on setting up a participatory prospective exercise as MED 2050

Appendix 5: Synergies with other MAP initiatives and activities



Annex IV

Roadmap for the Consultation of Decision-Makers and Stakeholders on the First Assessment Report on the Current State and Risks of Climate and Environmental Changes in the Mediterranean

Annex IV: Roadmap for the Consultation of Decision-Makers and Stakeholders on the First Assessment Report on the Current State and Risks of Climate and Environmental Changes in the Mediterranean

Introduction

1. Mediterranean Experts on Climate and environmental Change" (MedECC, www.medecc.org) is a network of scientific experts aiming at gathering, updating and consolidating the best scientific knowledge about climate change in the Mediterranean basin and render it accessible to policymakers, key stakeholders and citizens. To date, MedECC counts more than 600 scientific members from 35 countries, including 19 Contracting Parties to the Barcelona Convention.

2. The MAP – Barcelona Convention Secretariat jointly supports MedECC with the Secretariat of the Union for the Mediterranean (UfMS) to contribute to well-established processes on assessment both at Mediterranean and global levels.

3. This Mediterranean initiative has an important role to play in the work of the Intergovernmental Panel on Climate Change (IPCC), as it contributes to the Sixth Assessment Report (AR6); the AR6 will include a cross-chapter paper dedicated for the first time to the Mediterranean, to be prepared under the leadership of one of MedECC coordinators, ensuring a strong synergy across assessment reports.

4. MAP's support to MedECC is in line with the following UNEP/MAP objectives:

- The UNEP/MAP Mid-Term Strategy (MTS) 2016-2021 identifies Climate Change Adaptation as one of its cross-cutting themes, setting the objective to better understand climate change impacts as a condition to strengthen resilience. To reach this objective, the MTS points out the necessity to strengthen the interface between science and policy-making through enhanced cooperation with scientific institutions (Key Output 1.4.4).

- Accordingly, the MAP Programme of Work and Budget for 2018-2019 includes the Activity 1.4.4.1 "Implement, sustain, and strengthen the mechanism to assist Barcelona Convention with scientific institutions".

- The Mediterranean Strategy for Sustainable Development (MSSD) 2016-2025 identifies, under its Objective 4 "Addressing Climate Change as a Priority Issue for the Mediterranean", the establishment of "a regional science-policy interface mechanism (…) with a view to preparing consolidated regional scientific assessments and guidance on climate change trends, impacts and adaptation and mitigation options" as a regional Flagship Initiative.

- The Regional Climate Change Adaptation Framework for the Mediterranean also calls for "Better informed decision-making through research and scientific cooperation and availability and use of reliable data, information and tools" (Strategic Objective 4) through "Strengthening Science-policy interface and accessibility of related knowledge".

5. The Secretariat, through Plan Bleu Regional Activity Center, has supported the development of MedECC since its creation in 2015. The Secretariat participates in the MedECC Steering Committee, and the MedECC Scientific Secretariat is hosted by Plan Bleu in Marseille, France, and funded by the UfM through financial support from the Swedish International Development Cooperation Agency.

6. In 2016, MedECC launched, through a series of scoping and thematic workshops, the preparation of its first MedECC Assessment Report (MAR1) on current state and risks of climate and environmental change in the region.

7. In spring 2018, 160 scientists from 24 countries – including 15 Contracting Parties to the Barcelona Convention – applied to contribute on a voluntary basis to the preparation of MAR1. In March 2019, Coordinating lead authors met to ensure consistency, identify gaps and key messages, and work on chapters' executive summaries (Milan, Italy, 4-7 March 2019). In May 2019, the draft report went through a first internal review.

8. Upcoming steps (revised calendar) include:

- June-September 2019: Development of Second Order Draft (SOD);
- October-November 2019: External Review of SOD by scientific experts (large call);
- October-November 2019: Development of draft Summary for Policy-Makers (SPM);
- December 2019: Coordinating Lead Authors and Steering Committee Meeting on the draft SPM;
- December 2019- February 2020: Development of Final Draft (FD);
- February-March 2020: Review of FD and draft SPM by decision-makers and key stakeholders, including MAP Focal Points, MAP Components Focal Points, and MCSD Members;
- April-June 2020: Finalization of First Assessment Report and its SPM;
- 2020 (date tbc): Plenary discussion on SPM, involving Plan Bleu Focal Points and the MCSD Steering Committee, pending funding.

Proposed consultation process

9. The Meeting of Plan Bleu Focal Points (Marseille, France, 28-29 May 2019) highlighted the importance of MAR1 for all MAP policies, as climate change interacts with most themes of MAP interest. They recommended a broad consultation process of all MAP components and their Focal Points to be organized by the Secretariat (Plan Bleu) in collaboration with the MedECC Scientific Steering Committee and Secretariat.

10. Such consultation will also be coordinated with consultation through the UfM Climate Change and Environment Expert Groups.

11. A two steps process is proposed:

- MAP Components, their Focal Points and MCSD Members will be invited to participate in the review of the Final Draft and its Summary for Policy-Makers, tentatively planned in February 2020; and,
- Plan Bleu Focal Points and the MCSD Steering Committee will be invited to a plenary discussion on the Summary for Policy-Makers in Spring 2020, pending confirmation of available budget. During the plenary discussion findings reported in the SPM will be discussed to ensure clarity and full justification.

Annex V

Roadmap and Needs Assessment for the 2023 Mediterranean Quality Status Report

Annex V: Roadmap and Needs Assessment for the 2023 Mediterranean Quality Status Report

I. From the 2017 MED QSR to the 2023 MED QSR

In the context of implementing the Ecosystem Approach Roadmap adopted by the Contracting Parties to the Barcelona Convention and its Protocols in 2008 (Decision IG.17/6), the UNEP/MAP system delivered during the last biennium 2016-2017, the first ever Quality Status Report for the Mediterranean (hereinafter referred to as 2017 MED QSR, https://www.medqsr.org/). This is an assessment product based on region-wide Ecological Objectives and Common Indicators that is built upon existing data and complemented with inputs from numerous diverse sources.

Underlining the importance of this major and innovative MAP achievement, Decision IG. 23/6 on the 2017 MED QSR (COP 20, Tirana, Albania, 17-20 December 2017) pointed out several gaps (as laid out in Chapter II of this document) and requested the Secretariat "to prepare in cooperation with the Contracting Parties through the Ecosystem Approach governance structure, in the first year of the biennium 2018-2019, a Roadmap accompanied with a Needs Assessment on how to improve data collection to address knowledge gaps and strengthen the capacities of the system (the QSR 2023 Roadmap). To this aim, priority activities needed to successfully deliver the 2023 Mediterranean Quality Status Report shall be identified for inclusion in the Programme of Work".

Following up on Decision IG.23/6, the Bureau at its 85th meeting (Athens, Greece, 18-19 April 2018) requested "that the roadmap and Needs Assessment for the 2023 MED QSR, prepared in close collaboration with the EcAp Coordination Group, is presented at its 86th meeting".

The present paper describes the Secretariat's approach for the development of the 2023 MED QSR Roadmap in line with the above-mentioned COP 20 mandate and represents the first draft of the Roadmap. As such, it is detailing the main processes and milestones and related outputs and timelines, the implementation of which would allow the MAP system to fill the identified knowledge gaps and deliver, to the extent possible, a fully-fledged, quality-assured, region-wide and data-based 2023 MED QSR (First Draft).

The First Draft contains a narrative section describing findings of the initial assessment of key needs and the proposed milestones and steps needed to address such identified needs. Details are then contained in tabular form of the initial 2023 MED QSR Roadmap with Vision, Main Processes and Milestones and related Outputs (with proposed timelines), including the necessary involvement of the Ecosystem Approach governance mechanism.

This draft of the 2023 MED QSR Roadmap will be further elaborated and discussed, in line with Decision IG.23/6, in close cooperation with the Contracting Parties through the Ecosystem Approach Governance Structure.

II. Assessment of key needs to address knowledge gaps and strengthen the capacities of the system

Decision IG. 23/6 on the 2017 MED QSR pointed out several gaps and recommended the following general directions in order of successfully deliver the 2023 MED QSR:

(i) harmonization and standardization of monitoring and assessment methods;

(ii) improvement of availability and ensuring of long time series of quality assured data to monitor the trends in the status of the marine environment;

(iii) improvement of availability of the synchronized datasets for marine environment state assessment, including use of data stored in other databases where some of the Mediterranean countries regularly contribute;

(iv) improvement of data accessibility with the view to improving knowledge on the Mediterranean marine environment and ensuring that Info-MAP System is operational and continuously upgraded, to accommodate data submissions for all the Integrated Monitoring and Assessment Programme (IMAP) Common Indicators.

To specifically address the above-mentioned main directions in the development of the 2023 MED QSR, the Secretariat and MAP Components have reviewed the state of play of national implementation of IMAP, focusing on best practices and challenges faced with regards to different aspects of its implementation at national level, and initiated a discussion on a number of cross-cutting issues and region-wide challenges, that are crucial for ensuring the effective integrated GES assessment. An initial needs assessment on how to improve data collection to address knowledge gaps and strengthen the capacities of the system was developed in the "Progress Report on the implementation of Decision IG.22/7 on the Integrated Monitoring and Assessment Programme of the Mediterranean Sea and Coast and Related Assessment Criteria" (UNEP/MED WG.450/3). This document was presented at the Regional Meeting on IMAP Implementation: Best Practices, Gaps and Common Challenges (10-12 July, Rome, the Rome Meeting) which resulted in valuable lessons learned, conclusions and recommendations. They are guiding the work of the Secretariat towards the more detailed needs assessment to be provided cluster by cluster and discussed in the upcoming CORMON meetings and within respective Ecosystem Approach Governance Structure.

The following issues will be presented for review and in-depth discussion in the upcoming CORMON meetings:

a) Better interlinkages between Activities/Pressure/Impacts and clarification of definition of impacts noting that such a definition should primarily focus on biodiversity;

b) Clarifications of definitions of integration and aggregation rules. In this respect the Rome Meeting requested the Secretariat to make the necessary changes in document UNEP/MED WG. 450/3 opting for giving the priority at this stage of IMAP implementation to the work on geographical aggregation and assessment scaling rather than integration.

Consistent with the outcome of the Rome meeting, and acknowledging the achievements, lessons learned, and challenges faced during the current initial phase of IMAP implementation at national level, the following elements will be submitted for discussion at the upcoming CORMON meetings:

a) Efforts for coordinated national IMAP implementation should be enhanced, notably through technical proposals;

b) Tailored capacity-building activities should be established to fill the gaps clearly identified during IMAP national trainings, including on technical capacities, software, monitoring protocols, human resources needed, etc.;

c) Further efforts are necessary by the Contracting Parties to generate more synchronized datasets for assessments (collection of quality assured data in a coherent manner and format and availability of long-time data series to monitor trends);

d) IMAP compatible Pilot Info-system needs to be finalized to accommodate reporting of IMAP compatible data by the Contracting Parties, with clear distinction between mandatory and optional data;

e) Monitoring protocols and assessment methods have to be harmonized and standardized, including region-wide harmonized criteria for reference conditions and threshold/ boundary values per assessment area, as appropriate and feasible;

f) Further development of the risk-based approaches, analytical testing and assessment methodologies, assessment criteria for integrated chemical and biological assessment methods and testing of new research-proved tools for monitoring the toxic effects, as well as improvement of knowledge on emerging chemicals, are needed;

g) Testing of the Background Assessment Criteria (BACs) and Environmental Assessment Criteria (EACs) and thresholds application should be undertaken on a trial basis and at regional and sub-regional levels;

h) Identification and evaluation of marine litter accumulation (stranding fluxes, loads and linkage with specific sources) and hotspots using GIS and mapping systems and modelling tools

should be enhanced, including better understanding of transport dynamics and accumulation zones;

i) Science-Policy Interface should be strengthened, structured and sustained, by supporting the national monitoring programmes, to ensure that ongoing scientific projects can address IMAP national implementation needs;

j) Cooperation at sub-regional level for Common Indicators, as appropriate, to share best practices and addressing specific gaps within national monitoring programmes should be strengthened;

k) A continual exchange of best practices should be encouraged and established among thematic experts possibly through on-line communication tools for all three IMAP clusters.

Based on the findings of the 2017 MED QSR and related Decision IG.23/6, as well the recommendations of the Rome Meeting, the Secretariat has concluded a coordinated analysis with the involvement of all relevant components on major achievements and gaps of the 2017 MED QSR, priority needs and specific issues to address for each IMAP cluster. Specific recommendations were also coordinated on procedural (including meetings and coordination) needs, based on lessons learnt from the 2017 QSR process, in order to find realistic ways and means for addressing and filling the 2017 MED QSR identified gaps.

The outcome of this specific mapping resulted in:

(a) A vision of a better integrated and DPSIR-based Good Environmental Status (GES) assessment of the 2023 MED QSR and

(b) A short list of key priority needs which need to be addressed in order to achieve this vision, accompanied with the necessary main processes and milestones and related outputs.

Based on the outcomes of above steps undertaken by the Secretariat, key priority needs to be addressed towards a DPSIR-based GES assessment of the 2023 MED QSR are as follows:

1. Scale(s) of monitoring, assessment and reporting to be agreed on, to enable comparable data sets assessment;
2. Necessary methodological tools and assessment criteria to be agreed on to allow and promote integrated assessment of GES;
3. Full implementation of IMAP to be achieved, with data generation throughout the Mediterranean;
4. Fully operational SEIS-based IMAP Info System to be put in place to enable timely reporting of the Contracting Parties;
5. Monitoring Protocols and Data Quality Assurance and Quality Control for IMAP Common Indicators are to be made available to guide Contracting Parties;
6. National capacity and knowledge gaps are to be addressed to ensure region-wide coherence and data availability;
7. Regional partners, projects to be able to input process in a coordinate manner;
8. Regular, effective (and more frequent) regional coordination with the Contracting Parties to be put in place.

III. Vision and Milestones to be achieved for a successful delivery of the 2023 MED QSR

Vision: An integrated DPSIR-based GES assessment, developed on consolidated and quality-assured monitoring data sets, reported and processed through an effective IMAP Info System that is interoperable with national and other regional monitoring and reporting networks.

The 2023 MED QSR Roadmap is built around the following phases and processes:

1. Timely negotiation and agreement of Contracting Parties through the Ecosystem Approach Governance Structure at regional (and as appropriate at sub-regional) level on the scale(s) of monitoring, assessment and reporting;
2. Development and agreement of Contracting Parties through the Ecosystem Approach Governance Structure on necessary methodological tools and assessment criteria to allow and promote integrated assessment of GES at the level of Ecological Objectives and to the extent possible, across relevant Ecological Objectives;
3. Full implementation of IMAP-based national monitoring programmes throughout the Mediterranean to enable the region to generate quality assured and real time data during 2020-2022 (at least delivery of two sets of data for each IMAP cluster[112]);
4. Delivery and operationalisation of a user-friendly and SEIS-based IMAP Info System to collect and process data produced by IMAP-based national monitoring programmes;
5. Development and implementation of Monitoring Protocols and Data Quality Assurance and Quality Control for IMAP Common Indicators (depending on the nature of Common Indicators, to be developed on regional/sub-regional or national level and discussed, agreed on by the Contracting Parties through the relevant level of the Ecosystem Approach Governance Structure);
6. Continuous support and technical assistance to the Contracting Parties in relation to all the above areas;
7. Outreach to regional partners to provide inputs to the 2023 MED QSR, establishment of solid partnerships and development of a communication and visibility strategy for the 2023 MED QSR;
8. Regular and effective regional cooperation and coordination with the Contracting Parties, through CORMONs, under the guidance of the Ecosystem Approach Coordination Group.

Table 1 below details each of the above main processes and milestones of the roadmap, with main outputs and delivery timelines.

Once reviewed by the Bureau at its 87th Meeting in November 2018, this First Draft will be further elaborated in close coordination with the Contracting Parties through the Ecosystem Approach Governance Structure. In particular, the Ecosystem Approach Coordination Group Members will be requested to comment on the First Draft, including the reflections of the Bureau. The CORMON Meetings will follow the recommendations of the Ecosystem Approach Coordination Group in order to further address specific needs and necessary priority actions to deliver the outputs presented in Table 1, specific to their clusters, as provided for by Decision IG.23/6 on the 2017 MED QSR.

[112] Noting that in line with consultations throughout the UNEP/MAP system, it is most likely feasible to have at least two data sets in areas of pollution and marine litter and coast and hydrography, while only one data set can be assured for biodiversity and NIS throughout the Mediterranean

2023 MED QSR Vision:

An integrated DSPIR-based GES assessment, developed on consolidated and quality-assured monitoring data sets, reported and processed through a fully operational IMAP Info System that is interoperable with national and other regional monitoring and reporting networks

2017 MED QSR features (starting point)

This first regional assessment product, based on 23 IMAP common indicators, includes clear findings, conclusions and key messages related to each indicator. Data sources of the assessment include Contracting Parties' data sets as part of the MED POL data base, other relevant data provided by MAP components and MAP implemented project, and GFCM and other regional sources of data, including projects.

Data sets are provided to the extent possible for all common indicators but are incomplete and data availability is limited for the whole region. The assessment is limited in relation to integrated GES assessment (provided, if any, only across Common Indicators of specific Ecological Objectives). The assessment recognizes the need to address interlinkages between pressures/impacts and state of marine environment, but it cannot provide it in detail.

Decision IG.23/6 of COP 20 on 2023 MED QSR preparation provides for:

(i) harmonization and standardization of monitoring and assessment methods;

(ii) improvement of availability and ensuring of long time series of quality assured data to monitor the trends in the status of the marine environment;

(iii) improvement of availability of the synchronized datasets for marine environment state assessment, including use of data stored in other databases where some of the Mediterranean countries regularly contribute;

(iv) improvement of data accessibility with the view to improving knowledge on the Mediterranean marine environment and ensuring that IMAP Info System is operational and continuously upgraded, to accommodate data submissions for all the IMAP Common Indicators.

MAIN PROCESSES AND MILESTONES				
1. Scales of Monitoring, Assessment and Reporting	**2. Integrated assessment of GES**	**3. Implementation of national IMAPs throughout the Mediterranean** **6. Technical assistance and support**	**4. IMAP Info System** **5. Monitoring Protocols and Data Quality Assurance and Quality Control**	**7. Outreach and visibility**
OUTPUTS				
Analysis for each IMAP cluster on knowledge gaps, with focus on scales of monitoring prepared (mid 2019 - end 2020); Approaches on scales of monitoring for IMAP Common Indicators included in the IMAP Pilot Info System defined (2019); Scales of monitoring for all IMAP Common Indicators agreed (2021); Scales of assessment products for all IMAP Common Indicators clustered per Ecological Objectives proposed (2021-2022);	Analysis of interrelations between sectors, activities, pressures, impacts and state of marine environment for each Common Indicators included in the IMAP Pilot Info System prepared (2018-2019); Approaches for mapping the pressures/impacts/status of marine environment for the above IMAP Common Indicators defined (Rome Meeting); (2019-2020); Methodological concept developed and proposed to assess the interrelation of pressures/impacts/status of marine environment (2020); Methodological concept to support better integration of thematic assessment products	State of the national implementation of IMAP reported by the Contracting Parties (2018/2019, 2020/2021, 2021/2022); Minimum 3 sets of data on IMAP Common Indicators (EO5, EO9, EO10) reported by the Contracting Parties (2019, 2020, 2021/2022); Minimum 1 set of data (EO1 and EO2) reported by Contracting Parties (2021/2022); Minimum 2 sets of data (EO7, EO8) reported by the	IMAP information and data sharing policy developed (2019); IMAP Pilot Info system ready to upload monitoring data (end of 2019); Data dictionaries and data standards finalized for all IMAP Common Indicators (mid 2021); IMAP Pilot Info System updated to cover all IMAP Common Indicators (mid-2022);	Timeline for data-sharing with regional partners defined (2019-2021); Agreements reached with Regional Partners (2020); Communication and visibility strategy for the 2023 MED QSR developed and agreed (2021); Outreach to key partners is undertaken

Assessment criteria/thresholds/baseline values proposed/updated for IMAP Common Indicators included in the IMAP Pilot Info System (2020-2021); Assessment criteria/thresholds/baseline values initiated for all IMAP Common Indicators (2021-2022); Reporting formats adjusted to agreed scales of monitoring and scales of assessment products (2021-2022).	related to IMAP Common i.e. integration between Ecological Objectives (at national, sub-regional and regional scale) is agreed and tested (2020-2021); Thematic assessment products are prepared (2021-2022); 2023 MED QSR delivered (2023);	Contracting Parties (2020, 2021/22); Country capacity building trainings organized in line with their needs (2019-2021); Sub-regional/regional workshops and trainings, in areas of common capacity needs and knowledge gaps, organized (minimum 2 per sub-region), (2019-2021); Joint monitoring pilots designed and implemented (minimum 2 in participating countries), (2019-2021).	IMAP Info System fully operational enabling the Contracting Parties to report their monitoring data in 2020, 2021 and 2022. Monitoring Protocols drafted for IMAP Common Indicators included in the IMAP pilot Info System; (2018/2019); Quality Assurance and Quality Control schemes in place for IMAP Common Indicators included in the IMAP Pilot Info System (2019-2020); Quality Assurance and Quality Control schemes expanded to cover all IMAP Common Indicators (2021-2022).	and relevant meetings held (2019-2020); Communication and visibility strategy for the 2023 MED QSR is implemented (2021-2023); 2023 MED QSR published in 2 languages and on line available and presented at COP 23.

8. Effective Regional Collaboration
• CORMON meetings are held (minimum 1/year/cluster between 2019-2022); • Integrated CORMON meetings are held (minimum 1/biennium 2020, 2022); • Ecosystem Approach Coordination Group meetings are held (minimum 1/year between 2019-2023); • Sub-regional expert groups to address monitoring and assessment sub-regional specifics, including scales of assessment products and their integration, are held (minimum 1/biennium for all 4 sub-regions in integrated manner, for all clusters); • Online expert groups are held for each cluster, to ensure continuous work between CORMON meetings (to be re-established in CORMONs in 2019); • Bilateral meetings on MoU implementation are held, new MoUs are considered and partnerships with key partners are further strengthened; • Progress reports are submitted to the meetings of the Bureau of the Contracting Parties, the meetings of the MAP Focal Points and the COPs (2019-2023) for guidance and approval as appropriate.