



# CLUSTER (C\_A.3.1\_0014) WP3 (O.3.2)

## Consolidated Technical Sector Report

ARCES Association (PP1)

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## INTRODUCTION

In 2020 and 2021, the euro-Mediterranean region, like the rest of the world, went through a crisis that was perhaps unprecedented in its magnitude, intensity and specificity. The COVID-19 pandemic has struck in a widespread manner, generating collateral effects that mostly of the living people would never imagined, causing economic recessions unseen since the Second World War. The epidemiological emergency has caused effects of great complexity, producing a very strong and exceptional impact. The effects of the pandemic have been enlarged in 2022 by the Russian invasion of the Ukrainian Republic, causing the biggest and most impacting war in Europe since the Second World War. Such socio-political context leads to great uncertainty in the forecasting scenarios for the coming years, now even more critical, due to the economic consequences of the war and the related sanctions to the Russian economy.

Today, more than ever, the economic game is being played in the field of energy and the supply of energy resources, which, due to the war, has seen supply channels shrink considerably, with Russian raw material exports to Europe plummeting, due to the sanctions imposed by the western countries, EU and the NATO.

This scenario, combined with rising temperatures and global warming that particularly affected the southern Europe in 2022, caused an exceptional economic and social uncertainty.

Despite this critical situation, it is nowadays very important to reflect about the role of the European Union and its institutions at the global level. Not only as key player in the Ukrainian conflict and in the future peace process, but as the main stakeholder capable to orient the future choices with regard to the use of raw materials, energy policies, and the economical supply with a special attention to the climate change and the social inclusion of vulnerable groups. Definitely, all the governments and policy makers at every level must consider these topics as the most important challenges to be faced globally in the next coming years.

Having said that, the 'European Green Deal', launched in December 2019, remains a priority for the European Union; it defines the transition to a sustainable and inclusive economic model through the adoption of digital and clean technologies. Europe is aiming for climate neutrality by 2050 and will have to significantly increase its greenhouse gas emission reduction target, achieving the ambitious goal of a 55% reduction in CO2 emissions by 2030.

In this scenario the development of a sustainable and inclusive economy at the euro Mediterranean level can represent an opportunity in terms of job creation and environmental protection, facing at the same time such important challenges. In fact as Virginijus Sinkevičius, Commissioner for the Environment, Fisheries and Maritime Affairs said: “The pandemic has hit the marine economy sectors in different, but profound ways. We have an opportunity to start afresh, and we want to make sure that the recovery shifts the focus from mere exploitation to sustainability and resilience. Thus to be truly green, we must also think blue.”

## Methodology

This report is the result of a desk analysis carried out on behalf of the ARCES Association within the framework of the CLUSTER project funded by the ENI CBC Med 2014-2020 Programme. The document has been drafted including the contribution of local and international stakeholders and partner organisations coming from the 7 Mediterranean project countries, as well as the main resources and articles produced by national and international institutions. This document represents a consolidated report, which includes 4 qualitative and quantitative analysis focusing on the 4 project sectors: blue economy, green economy, circular economy and sustainable agriculture.

For each macro sector, a qualitative and quantitative analysis was made, starting with an overview of the main characteristics and peculiarities of each. In particular, after describing the state of the art at the Mediterranean level, the market needs, weaknesses and development opportunities offered by the blue, green and circular economy and sustainable agriculture were analysed and described for each field of study. Although the analysis focuses on the Mediterranean basin as a whole, for each macro sector, the most important and significant sub-sectors and activities have been described. Furthermore, thanks also to the needs assessment made by the project partners, a specific description of the scenario characterising each of the seven countries (Spain, Italy, Cyprus, France, Jordan, Palestine and Tunisia) was provided, with particular attention to the regions where the project activities will be implemented. An attempt was also made to describe the development opportunities offered at the Mediterranean level for each of the economic sector, especially in terms of economic value, creation of new jobs and environmental preservation, as well as to analyse the impact the Covid-19 pandemic had at the economic and social level.

## The new 'green jobs'<sup>1</sup>

With the final aim to boost the Green transition and to achieve the 2030 Green Deal' goals, several new jobs will be needed especially in the fields of Sustainable Agriculture, Green Economy, Circular Economy and Blue Economy

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<sup>1</sup> Green Job Database – 'EGREJOB - Euro-Mediterranean GREen JOBS'. ENPI CBC Project 2007-2013, Tuscany Region. ARCES Association. *The blue economy and circular economy in the italy-malta cross-border cooperation framework: an employment opportunity. Report on the Italy-Malta labour market.* Jobmatch 2020. Italy, 2020.

<p><b>GREEN ECONOMY AND AGRICULTURE</b></p>	<ul style="list-style-type: none"> <li>- Organic Agronomist</li> <li>- Energy Manager</li> <li>- Project Manager for incentive management</li> <li>- Farm and Home Management Advisors</li> <li>- Forest and Conservation Workers and Technicians</li> <li>- Soil and Plant Scientists</li> <li>- Eco-innovation experts</li> <li>- Bio agriculture experts</li> <li>- Geothermal Production Managers</li> <li>- Wind Energy Engineers</li> <li>- Solar Energy Systems Engineers</li> <li>- Food safety and quality experts</li> <li>- Food supply chain technician</li> </ul>
<p><b>PUBLIC SECTOR AND RESEARCH</b></p>	<ul style="list-style-type: none"> <li>- New normative and regulation Advisor (technical, judicial-economic profiles).</li> <li>- Green New Deal Program Management Advisor.</li> <li>- Climate Change Analysts</li> <li>- Environmental Economists</li> <li>- Environmental Scientists and Specialists</li> <li>- Geoscientists</li> <li>- Agricultural Inspectors</li> <li>- Regulatory Affairs Specialists</li> <li>- EU/international funds project manager</li> <li>- Urban and Regional Planners</li> <li>- Biotechnologist.</li> </ul>
<p><b>UTILITIES</b></p>	<ul style="list-style-type: none"> <li>- Renewable Energy Plants production and maintenance (technical profiles).</li> <li>- Environmental engineers.</li> <li>- Bioenergy and Bio architecture Specialist.</li> <li>- Project and Smart Grid Expert.</li> <li>- Smart Grids and IT device production specialist (i.e. monitoring switchboard, new generation electric meters).</li> <li>- Power Plant Operators</li> <li>- Solar Energy Installation Managers</li> </ul>

<p><b>CIRCULAR ECONOMY</b></p>	<ul style="list-style-type: none"> <li>- Waste transformation and disposal implant Design Engineer.</li> <li>- Waste collection and transformation technicians, and Environmental recovery and remediation technicians.</li> <li>- Industrial Ecologists</li> <li>- Recycling and Reclamation Workers</li> <li>- Recycling Workers and Coordinators</li> <li>- Brownfield Redevelopment Specialists and Site Managers</li> <li>- Biofuels/Biodiesel Technology and Product Development Managers</li> <li>- Biomass Power Plant Technicians and Managers</li> </ul>
<p><b>BLUE ECONOMY</b></p>	<ul style="list-style-type: none"> <li>- Aquaculture technicians.</li> <li>- Coastal tourism experts.</li> <li>- Marine biotechnology experts.</li> <li>- Energy Engineers and technicians specialized in Ocean Energy.</li> <li>- Mining Engineers and Technicians specialized in Seabed Mining.</li> <li>- Marine and Agrifood, Technology Experts.</li> <li>- Environmental Health and Safety Experts.</li> <li>- Aquaponics and Hydroponics expert</li> <li>- Water Resource Specialists</li> <li>- Fishing tourism operators</li> </ul>

# BLUE ECONOMY

## Sector overview

During the past years, the term ‘Blue Economy’ together with the concept of ‘Blue Growth’ became commonly used all over the world, due to its use at the institutional and journalistic level. Today for some people, Blue Economy means the use of the sea and its resources for a sustainable and economic development. For others, it basically refers to any economic activity linked with the maritime sector, whether sustainable or not.

Despite the increasing high-level usage of the Blue Economy concept and a wide range of policies and investment in this macro sector, there is still no generally accepted definition of the term<sup>2</sup>.

In the early ‘90s a Belgian entrepreneur Gunter Pauli – founder of Z.E.R.I. (Zero Emissions Research and Initiatives) a network of successful entrepreneurs dealing with environmental issues – used this expressions referring to a sustainable business models that could have a positive long-term impact on seas and oceans.

Definitely, we can say that this concept is mainly linked with two main concepts which represent its two main pillars, i.e. the sea-related economy and the environment. Therefore the Blue Economy interests all economic sectors directly or indirectly concerned with the sea and its coastline, including a wide range of sectors and subsectors, among them: fishery, fishing and fish processing, shipbuilding and repairing, recycling, maritime transportation, coastal tourism, deep-sea mining, aquaculture, marine mineral resources, blue biotechnology, energy production, port activities, etc.

At the same time, and despite the high number of people employed in Blue Economy sectors and subsectors, especially in the Mediterranean sea, the risk of an unhealthy marine environment due to the pollution, global warming and overexploitation represent a treat can no longer be put off. In fact, it is urgent to reduce and contain several danger phenomena particularly affecting the Mediterranean Sea, among them: reduction of the marine biodiversity, habitat destruction and degradation, sea and ocean acidification, piling of marine debris, and temperature rise, etc.<sup>3</sup>. Definitely, these are no longer a secret among public opinion and decision makers: effective policies promoting the use of recyclable materials, as well as the adoption of circular business models, which include the reuse of products, packaging and scraps, however, could curb the effect of such dangers.

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<sup>2</sup> ‘Principles for a sustainable Blue Economy’ (WWF Baltic Ecoregion Programme), [www.panda.org/baltic](http://www.panda.org/baltic)

<sup>3</sup> “Jobmatch 2020. The blue economy and circular economy in the italy-malta cross-border cooperation framework: an employment opportunity. Report on the italy-malta labour market”, ARCES Association, 2020.

*A sustainable Blue Economy promotes economic growth, social inclusion and improved livelihoods while ensuring the environmental sustainability of the natural capital of the oceans and seas. For the purpose of this report, the sustainable blue economy encompasses all sectoral and cross-sectoral economic activities related to the oceans, seas and coasts. It comprises emerging sectors and economic value based on natural capital and non-market goods and services through the conservation of marine habitats and ecosystem services.*

Source: Sustainability criteria for the Blue economy. European Climate, Infrastructure and Environment Executive Agency - CINEA

The Blue economy is considered being a pillar of the euro-Mediterranean development by the European Commission, since it employs more than 5.4 million people and it generates around 500 billion euros gross per year as added value. So, because of the extremely high growth potential, it has been included into the EU agenda, thus representing an economic driver for the next decades. The EU institutions are aware that to exploit the opportunities offered by this macro sector, it is essential to boost the transition to a more sustainable and inclusive Blue Economy. It requires promoting tailored national and European public policies and investing in innovative and environmental-friendly technologies, such as wave and tidal energy, algae production, development of innovative fishing gear, coastal protection, sustainable tourism and restoration of marine ecosystems, which can lead the economic development of the Mediterranean Sea, creating new employment and businesses models.

Therefore, according to the agenda of the European Commission the transition to a sustainable blue economy model must comply with the following actions<sup>4</sup>:

1. Achieve the objectives of climate neutrality and zero pollution
2. Switch to a circular economy and reduce pollution
3. Preserve biodiversity and invest in nature
4. Support climate adaptation and coastal resilience
5. Ensure sustainable food production
6. Improve management of space at sea

The EU institutions have to work jointly with Member States to increase their cooperation and funds with the aim to reduce pollution in European seas and support investment for blue innovation and blue bio economy. The EC asked member states to include such investment plans in their National Resilience and Recovery Plans, as well as their national operational programmes for various EU-funds from now to 2027. Moreover, other EU programmes such as

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<sup>4</sup> European Green Deal: Developing a sustainable blue economy in the European Union – Press release, 05/17/2021 [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_21\\_2341](https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2341)

Horizon Europe, pillar of the 2021-2027 financing period, will contribute to the technological innovation and research in Blue Economy-related sectors and sub sectors.

Beside that, the EC decided to structure its strategy in Blue Economy by targeting specific policies and strategies which take into consideration different aspects such as climate, environment, local economy, culture and local society, specific for the local community basin, i.e., the Adriatic Sea and the Ionian Sea, the Arctic Ocean, the Atlantic Ocean, the Baltic Sea, the Black Sea, the Mediterranean Sea, the North Sea. Moreover, the EU policies have identified within the Blue economy some strategic sector considering them as the most prominent and emerging ones in terms of Gross Value Added (GVA)<sup>5</sup> and employment creation:

1. Blue Energy
2. Aquaculture
3. Cruise, maritime and coastal tourism
4. Marine mineral resources
5. Blue biotechnology

### Blue Economy sectors' needs, perspectives and threats

As mentioned above, therefore, the Blue Economy is essentially a macro sector of the economy that encompasses a wide range of economic sectors and even more specific sub-sectors, which are directly or indirectly related to the ocean's economy. Here below is provided a more detailed analysis of the most economically important Blue Economy sectors at the Mediterranean level.

#### **1. Fishery and Aquaculture:**

Both sectors represent around the 8% of the Employment of the Mediterranean Blue Economy (around 350,000 employees). Fishery in Mediterranean Sea has always been a fundamental sector all over the centuries, representing often the main income economic sector for many coastal communities across the '*Mare nostrum*', as well as being a sign of cultural identity.

From the 20th century onwards, due to the constant increase of the world population and thus due to the growing demand for fish, not only in Europe but also in other continents, 90% of fishery reserves have constantly overexploited by the fishing industry.

Today, however, the balance of the oceans is threatened by climate change, pollution and overfishing, which according to the FAO affects more than 34% of fish populations<sup>6</sup>.

For the Marine Stewardship Council (MSC) - an international no-profit organisation established to address the problem of the unsustainable fishing practices - a 'sustainable fishery' must respect three main principles<sup>7</sup>:

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<sup>5</sup> Gross Value Added (GVA): value of the amount of goods and services that have been produced, less the cost of all inputs and raw materials that are directly attributable to that production.

<sup>6</sup> FAO. 2022. *The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*. Rome, FAO. <https://doi.org/10.4060/cc0461en>

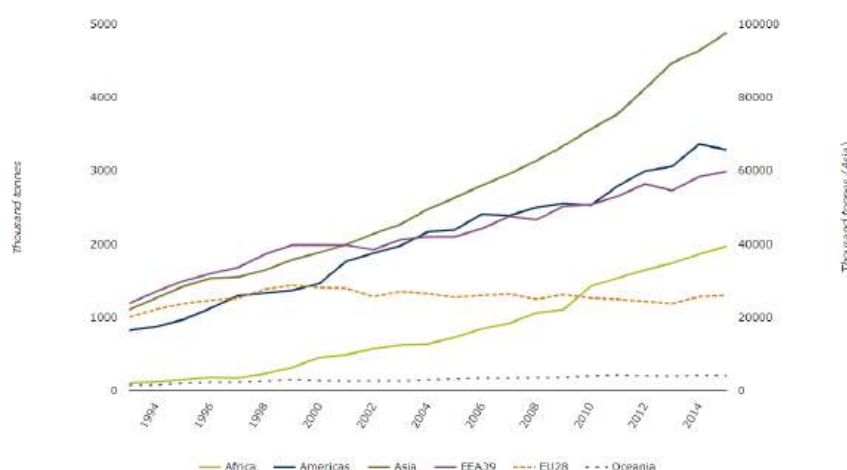
- Fishing leaves enough fish in the sea so that the marine population can reproduce and the fishery can continue over time, in accordance with scientific recommendations on the state of fish stocks;
- Fishing is carried out in such a way as to minimise its impact on the ecosystem, allowing marine flora and fauna to flourish;
- Fishing is managed responsibly in compliance with applicable laws and in a manner that can adapt to change.

In order to achieve these objectives, it is important to ensure the transition towards sustainable practices would involve long-term financial strategies as well as financial aids for the hundreds of thousands small enterprises operating in the Mediterranean Sea. In this sense, the European Union legislation can play a key role in promoting the blue transition both in northern and southern Mediterranean communities, since as predicted by OECD, the blue economy have the potential to outperform the average global economic growth creating an added value from an economic and an occupational perspective<sup>8</sup>.

Furthermore, since the seas have no borders and are difficult to control an international shared regulation of sustainable fishery practices should be considered as a must-have.

By 2030 Aquaculture will increase its production up to 112% (Mediterranean EU countries).

Marine aquaculture production is increasing in Europe since the early '90s, mostly due to salmon production in Norway, which is the main producer. For the same period of time, inland



**Figure 1: Global Aquaculture production by continent (European Environment Agency)**

aquaculture in the Mediterranean area is stable, and the main producer is

Turkey. Beside the Atlantic salmon, in 2015, the most cultivated species in Europe were blue mussels, rainbow trout, European sea bass, gilthead sea bream, oysters and carps, barbels and other cyprinids. In the Mediterranean basin, the countries with the highest production are Spain, Turkey, France, Italy and Greece considering both fish and molluscan production. On the contrary, if we consider the marine aquaculture production relative to coastline length Spain, Malta and Turkey have the highest percentage at the Mediterranean level<sup>9</sup>.

<sup>7</sup> <https://www.msc.org/uk/what-we-are-doing/our-approach/what-is-sustainable-fishing>

<sup>8</sup> *The Ocean Economy in 2030*. OECD publishing. Paris (2016). [https://read.oecd-ilibrary.org/economics/the-ocean-economy-in-2030\\_9789264251724-en#page4](https://read.oecd-ilibrary.org/economics/the-ocean-economy-in-2030_9789264251724-en#page4)

<sup>9</sup> <https://www.eea.europa.eu/data-and-maps/indicators/aquaculture-production-4/assessment>

## 2. Coastal Tourism

If we consider the Mediterranean countries all together, our sea is the most visited touristic destination in the world. In 2014, it recorded more than 300 million international tourist arrivals, representing the 30% of total world tourists for 2014. Definitely, the Mediterranean is the top world tourist destination as the domestic and international tourism is constantly grow, from 58 million arrivals recorded in 1970 to 500 million visitors expected by 2030 (other estimations show an increase of between 440 and 665 million by 2025<sup>10</sup>). Around the 50% of these arrivals are in coastal areas. Due to this statistics, tourism can be considered as the major economic sector in the Mediterranean area, especially for some country as Spain, Italy, Greece, Malta, Republic of Cyprus, Egypt, Tunisia, Turkey, etc.<sup>11</sup>, both in terms of employment (around of 12%) and GDP (11,3%). The impact of tourism sector on the Mediterranean economy is even more evident if we consider only coastal areas where tourism represents the 70% of Gross Value Added (GVA).



Figure 2. Expected trends of international tourist arrivals in the Med region, in million (WWF, UNWT).

On the other hand, coastal tourism (represented by the so-called 3S model: Sun, Sea and Sand) strongly impact coastal areas, causing many of the problems associated with

uncontrolled human activities. In fact, due to the coastal development, during last decades, thousands of coastline across the Mediterranean have been exploited and in the last 20 years (from 2005 to 2025) more than 5000 Km have been artificialized<sup>12</sup>. Consequences of the uncontrolled coastal development are:

- Coastal urbanization and land degradation;
- Water pollution and marine littering;
- Overconsumption of natural resources (water supply, etc.) and loss of natural habitats;
- Overexploitation of local infrastructures;
- Loss of Biodiversity and decrease of the aesthetic value of landscapes;
- Low-quality employment generated (seasonal, low salaries, unqualified, often part-time, etc.);

<sup>10</sup> Tourism in the Mediterranean: Trends and Perspectives, J. Tresserras, IEMed

<https://www.iemed.org/publication/tourism-in-the-mediterranean-trends-and-perspectives/>

<sup>11</sup> The top five Mediterranean destination countries account more than 80% of the international tourist arrivals (ITAs): France (83.7 million in 2014), Spain (65 million), Italy (48.5 million), Turkey (40 million) and Greece (22 million). While the North Mediterranean countries represent the 78% of total ITAs, South Mediterranean countries only account the 22% of total. UNEP, MAP, Plan Bleu (2016), 'Tourism and sustainability in the Mediterranean: key facts and trends', [http://planbleu.org/sites/default/files/publications/tourism\\_and\\_sustainability\\_june2016.pdf](http://planbleu.org/sites/default/files/publications/tourism_and_sustainability_june2016.pdf)

<sup>12</sup> Barcelona Convention - Mediterranean 2017 Quality Status Report <https://www.medqsr.org/tourism>

- Unbalanced distribution of tourism value produced and GVA;

Keeping in mind all the above mentioned threats it is important to focus the attention on a more sustainable coastal tourism development, capable of generating high-quality employment and job opportunities for the local communities as well as to preserve the environment, avoiding the overexploitation of the coastline, the loss of natural habitats and the water pollution. Local and international institutions must work hard to promote the sustainable tourism as 'driver' of the coastal tourism development in both Northern and Southern Med countries with the final aim to *"develop and promote practices and solutions to ensure efficient use of natural resources and reduce environmental impacts of tourism, respecting spatial, ecological, and socio-cultural carrying capacities of the destination"*<sup>13</sup>.

According to the EU institutions several actions can be carried out to promote the use of efficient practices and to balance the negative impact of the massive coastal tourism on the local communities:

- Cost reduction through energy savings: employing sustainable tourism practices can enable hotels and other operators to reduce operational costs.
- Market differentiation and revenue increase: tourism assets, such as cultural heritage, landscapes and biodiversity, play an important part in a tourist's destination choice.
- Developing low season tourism, reducing the impact on the territories. In the Mediterranean area, tourist flows are concentrated during the summer season. This has negative impacts in terms of employment, environment (congestion of natural areas, disturbance of wildlife, exhaustion of natural resources etc.) and saturation of infrastructures (airport, trains, roads, energy and water supply, etc.). Tackling the seasonality issue by extending tourism during the low and medium season could thus create more and better jobs reducing the pressure on the environment<sup>14</sup>.
- Promoting small-scale accommodation and local business operators as main actors of the sustainable tourism.
- Promoting ecotourism: compared with traditional tourism, it has been estimated that ecotourism can return up to 95% of revenues to the local economy<sup>15</sup>.

### **3. Maritime transport (passengers) and cruise tourism**

Both sectors employ almost one million of workers across the Mediterranean. Mediterranean Sea is among the most important cruise areas in the world: In 2013, 136 cruise ships were deployed in the Mediterranean and 27 million cruise passengers went through Mediterranean ports, while in 2019 the number grew up to 30 million of passengers. It is important to highlight that 75% of Mediterranean ports are located in the northern shore, mostly Italy, Spain, France, Greece, Croatia

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<sup>13</sup> UNEP, MAP (2017) Regional action plan on sustainable consumption and production in the Mediterranean, [https://wedocs.unep.org/bitstream/handle/20.500.11822/20731/uneppmap\\_SCPAP\\_eng\\_web.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/20731/uneppmap_SCPAP_eng_web.pdf?sequence=1&isAllowed=y)

<sup>14</sup> 'Blue Economy in the Mediterranean', R. Mancini and A. Sensi, UfM.

<sup>15</sup> <https://ocean.economist.com/governance/articles/will-tourism-recover-from-the-covid-19-crisis-sustainably>

and Slovenia, while 9% of ports are in Turkey and Cyprus; and 7% in Northern Africa. (Plan Bleu 2017). This is especially due to a lack of infrastructures in the Southern Mediterranean.

Beside the fact that cruise tourism in the Mediterranean has been rising in recent years, ships have evolved constantly in terms of tonnage and number of passengers, in fact several of these mega-cruisers can hold more than 5-6,000 guests and 2,000 crewmembers at a time, becoming even more a model of "floating cities"<sup>16</sup>.

While on the one hand the growth of the cruise and maritime transport sector represents a job opportunity for hundreds of thousands of people throughout the Mediterranean basin, on the other hand it can be a problem for the maritime ecosystem, especially due to water pollution caused by the production of waste or the sewage systems of cruise ships, as well as air pollution and coastal erosion in some cases. Definitely managing this growth is essential to preserve the natural and cultural resources that attract people to the Mediterranean. Clearly, efforts must be done to limit the environmental impacts of cruising as far as possible, particularly in ecologically vulnerable areas.

To make an example, it is estimated that cruise ships in the Mediterranean can produce up to 800 million litres of wastewater per year that can be discharged at sea without treatment. The development of sustainable practices is thus necessary to decrease the environmental impact of the sector.

Cruise companies have several options to limit the environmental footprint of their activities, including: Switching to modern engines that lower emissions and eliminate haze;

- Adopting mechanisms of ballast water control, according to the Ballast Water Management Convention;
- Choosing mooring locations to avoid anchor damage to the sea floor and disruption of benthic habitats;
- Treating sewage before discharge within 4-10 miles of land;
- Shifting from dirty heavy fuel oil to a low sulphur fuel. With this regard new fuels under development include hydrogen, ammonia, methanol and nuclear. Danish shipping company Maersk is planning to launch a methanol-based liner in 2023. Wind is another option, and some company already hopes to launch a wind-powered carrier in 2025<sup>17</sup>.
- Using scrubbers (pollution control systems) to decrease nitrogen oxide emissions (NOx)<sup>18</sup>.

This transition to new and more sustainable technologies can itself represent surely an opportunity to create new jobs and to boost the 4.0 industry.

Moreover, public institutions should implement specific policies aimed at managing the cruise traffic, keeping out large ships from vulnerable areas including marine reserves, small islands and coastline cities with an important and delicate natural and architectonic ecosystem, like Venice.

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<sup>16</sup> [https://www.wwfmmi.org/medtrends/shifting\\_blue\\_economies/cruise/](https://www.wwfmmi.org/medtrends/shifting_blue_economies/cruise/)

<sup>17</sup> <https://ocean.economist.com/innovation/articles/how-the-shipping-sector-is-decarbonising>

<sup>18</sup> Mancini R. and Sensi A., *Blue Economy in the Mediterranean*, UfM.

#### 4. Shipping

Global shipping is expected to grow by 4% per year. The Mediterranean already carries about 15% of global shipping; this percentage is expected to grow in the next decade in terms of number of routes, traffic intensity and size of ships. The increased capacity of the Suez Canal has doubled the number of cargo ships that pass through the Mediterranean with its continuous flow of noise and gas emissions.

The sector generates an annual gross added value of €27 billion, provides jobs for more than 500,000 people<sup>19</sup>. Main consequences of this growth are environmental impacts, such as chemical pollution, noise pollution and of course water pollution, also because the Mediterranean Sea is almost 'closed' since is connected to the Atlantic Ocean only through the strict of Gibraltar. For this reasons, shipping activities with the most serious potential environmental impacts – such as the transport of dangerous goods or hydrocarbons – should be avoided or strongly limited. The solution to these treats includes the switch to modern engines and the development of different means of transportation for goods and raw materials as railways, pipeline and gas pipeline.

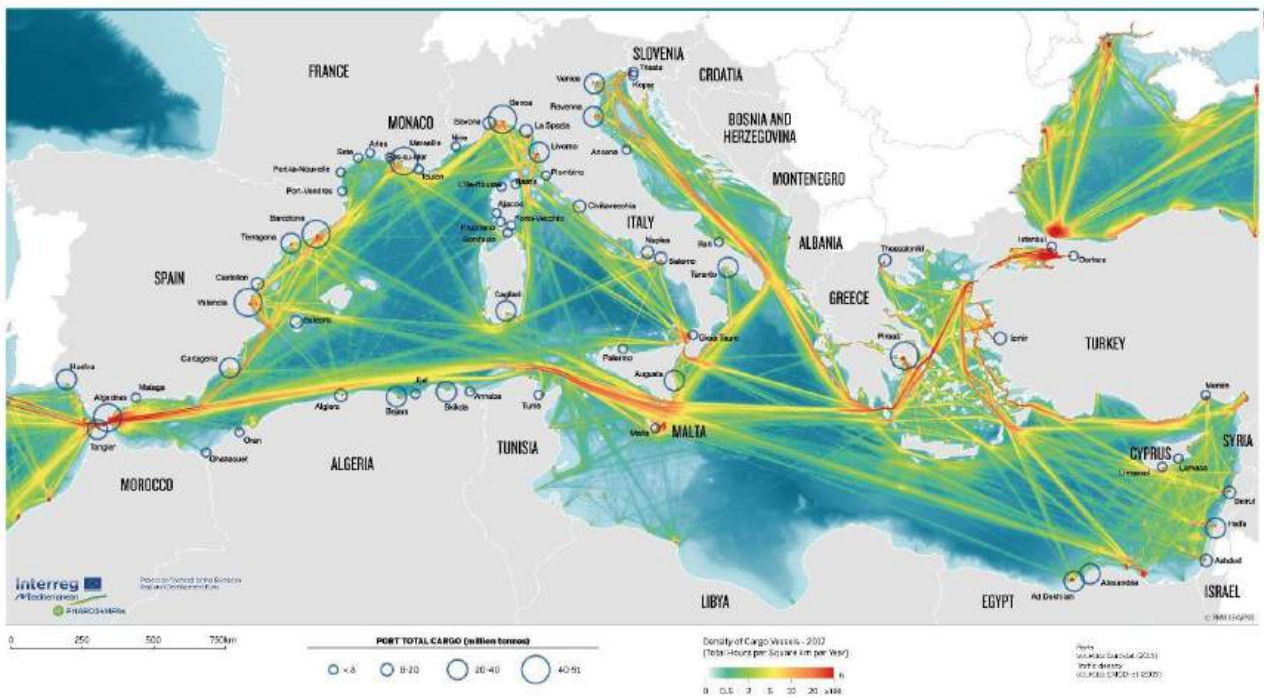


Figure 3. Main ports and annual density of cargo vessels transiting in the Mediterranean Sea (WWF).

#### 5. Offshore wind energy

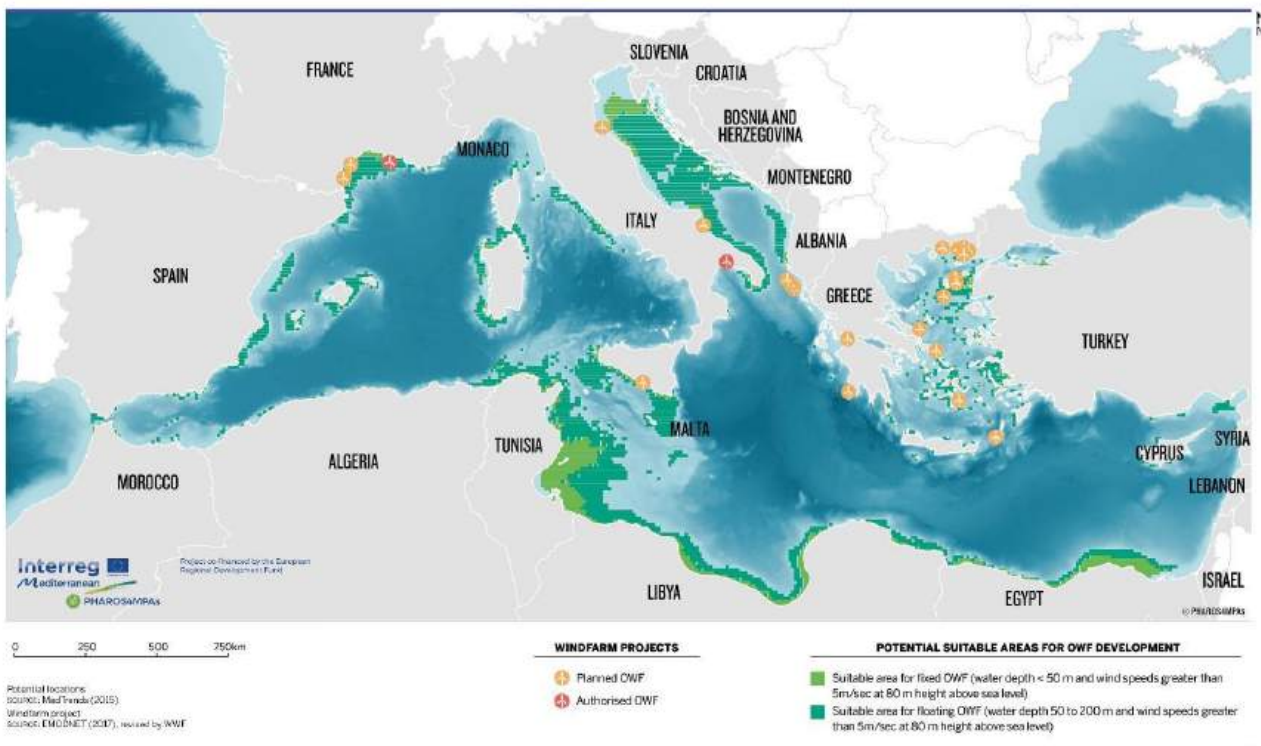
Despite the development of the sector in the region is just starting, as happened in the Northern Sea where several wind offshore farms have been installed, in the Mediterranean Sea it has a great potential of development since it is considered a pillar of the 'Green Transition' boosted by the EU.

EU renewable energy targets agreed aim to achieve a 40% cut in greenhouse gas emissions compared to 1990 levels, and to increase the renewable energy contribution to the total

<sup>19</sup> [https://www.wwfmmi.org/medtrends/shifting\\_blue\\_economies/maritime\\_traffic/](https://www.wwfmmi.org/medtrends/shifting_blue_economies/maritime_traffic/)

consumption at least 27% by 2030. In this sense, the growth of the offshore wind energy sector will undoubtedly continue quickly.

Italy is the first country to set up a wind farm off the Mediterranean coast, near the port of Taranto, in Apulia. Approved in 2019 and inaugurated on 21 April 2022, the plant has a capacity of 30 MW<sup>20</sup> provided by ten turbines. Another offshore wind farm project has been proposed in Sicily (60 km off the Sicilian coastline) and it is expected to have 190 floating turbines, with a total capacity of 2.8 GW, supplying energy to about 3 million households. Work should start in 2025 and once it will be fully operational, it is expected to replace three traditional power plants<sup>21</sup>. The European Commission approved four demonstration projects for offshore wind power plants proposed by France, three of which will be installed in Mediterranean waters for a total capacity of 24 MW.



**Figure 4. Potential areas suitable for OWF development vs. planned and authorised OWF projects in the Mediterranean Sea (WWF).**

Definitely, future locations of OWFs should be decided through processes that take into account conservation objectives, avoiding ecologically valuable areas, and in particular protected areas.

<sup>20</sup> [https://maritime-executive.com/article/italy-inaugurates-the-first-offshore-wind-farm-in-the-mediterranean;](https://maritime-executive.com/article/italy-inaugurates-the-first-offshore-wind-farm-in-the-mediterranean)  
<https://www.offshorewind.biz/2022/04/22/first-mediterranean-offshore-wind-farm-up-and-running-in-italy/>

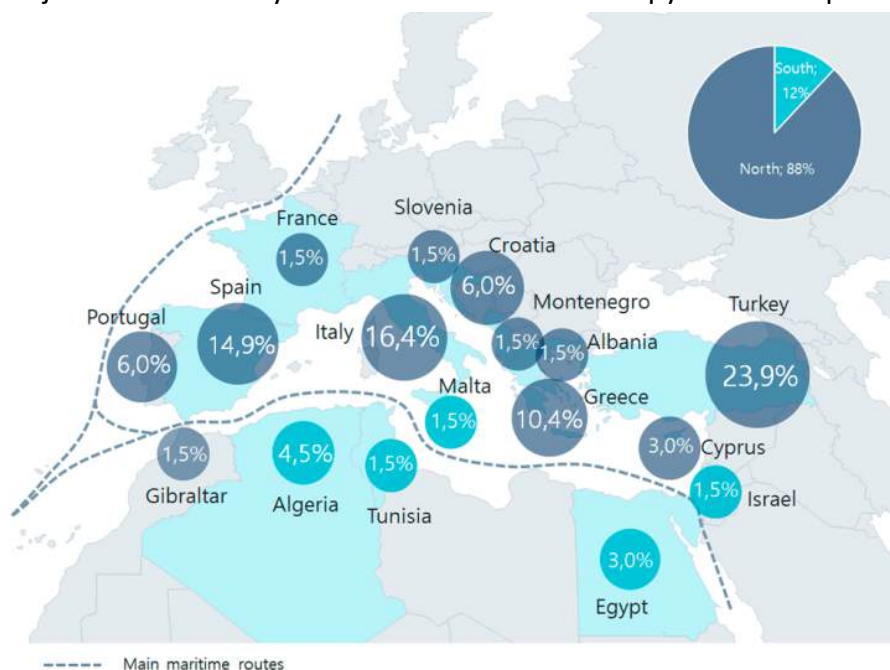
<sup>21</sup> <https://medwind.it/parco-eolico-offshore-medwind/>

The Maritime Spatial Planning Directive (MSPD, 2014/89/EU) and other proposed instruments such as the WWF 'Ecosystem-based Maritime Spatial Planning'<sup>22</sup> should be taken into consideration to ensure that offshore wind farms are not installed in areas with habitats, species, ecological processes or even human activities (like fishery) that are likely to be particularly sensitive to these impacts, whether during construction or operation.

## 6. Shipbuilding and Recycling

The shipbuilding industry (building, repair, disposal and recycling) accounts today for about 4 % of total value added by ocean-based activity worldwide. Considering the Mediterranean Sea it counts around the ..... of GDP. In some country it ranges up to the .....

Regardless of the ship type, cruises, passenger ferry, military vessels, commercial vessels, etc. every vessel is called to be repaired, maintained or refitted according to its applicable regulation. With regard to the infrastructures we can divide the shipyards into two typologies based on the object for which they were built: construction shipyards and repair and maintenance shipyards.



**Figure 5. Distribution of repair shipyards in Iberian Peninsula & Mediterranean Sea (Percentage of shipyards out of total; 2019). Source: Sectoral analysis.**

As shown in the figure 9, Mediterranean countries are, after Northern Europe, the largest region in terms of shipyards both for construction and repairing. This is due to its geographical positioning and climate conditions, that allow to work throughout the full year. However, we have to highlight that almost 90% of the existing shipyards are concentrated on the north side, due to mostly adequate infrastructures (docks, shipyards, etc.) able to host or build large-tonnage vessels (only

<sup>22</sup>[https://wwfeu.awsassets.panda.org/downloads/wwf\\_eb\\_maritime\\_spatial\\_planning\\_guidance\\_paper\\_march\\_2021.pdf](https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf)

few existing shipyards have the capacity to handle vessels over 300m in length), high-qualified workforce as well as an important historical tradition<sup>23</sup>.

Italy, Turkey, Spain and Greece represent more than 65% of the number of operating repair yards in the Mediterranean, while south Mediterranean countries only represent less than 10%.

Due to lower costs and qualified personnel, Turkey is the country with the highest number of repair yards. Its shipyards are specialized in structural repairs and are located mainly in the Golden Horn.

Italy and Spain are the countries with the highest number of repair and construction shipyards, despite the higher costs of the workforce, due to their infrastructures and high-level of specialization of their personnel.

North African and Middle East countries are still penalised by lack of qualified personnel, infrastructures and low quality standards, in fact they have only few repair yards and existing ones are generally geared to small vessels.

Finally, costs and staff qualifications are key parameters, especially in the most technologically advanced vessels. If we focus on the balance between staff costs and qualification, we can see that Western countries, as Spain or Italy, count with high-qualified staff that imply higher costs, compared with Turkey, Croatia or Egypt, but able to work with the most advanced technologies, essential for the construction or the refurbishing of the most advanced and modern vessels.

For this purpose, repair shipyards market should be prepared to meet not only the increase of vessels to attend in the coming years, but also to meet the new challenging vessels size and complexity.

The shipbuilding sector ultimately has great potential for development, also driven by the high demand of cargo vessels and the growth of the cruise sector in recent years. This sector therefore represents an asset within the blue economy, with great potential for absorbing the workforce. As we have seen, however, the workforce will require even more differentiated qualifications with different levels of specialisation. Definitely, it will be crucial in the next coming years to train young people with specific characteristics, competencies and skills as required by the job market.

## **7. Marine Mining and Oil & Gas industry**

Despite the largest concentration of oil platforms is in the North Sea, several Mediterranean countries are issuing new authorisations for oil extraction. The Mediterranean Sea is already considered one of the most polluted seas in the world. Over 20% of the Mediterranean basin is currently covered by oil and gas exploration contracts while the 24% has been designated for the exploration. It is expected that offshore gas production will increase by 2030.

Italy is significantly expanding its extraction activities, in particular in the Adriatic Sea and in the waters south and west of Sicily, but Egypt, Tunisia, Libya, Malta and Croatia are also reportedly interested in exploiting additional deposits, while Spain is preparing new licences for oil and gas

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<sup>23</sup> <https://algnewsletter.com/maritime/mediterranean-shipyards-market-factors-that-drive-the-selection-of-a-shipyard/>

extraction along its eastern and western coasts. In recent years, the eastern Mediterranean has been at the centre of a crescendo of economic interests related to the exploitation of natural resources, especially after the discovery of new gas reserves<sup>24</sup> also thanks to new technologies that allowed for reconnaissance, exploration and extraction.

As is to be expected, the prospect of economic opportunities in this sector has attracted the attentions of energy companies and governments especially after the Europe's energy crisis, which has prompted many governments and private companies to look for new gas supply channels to cope with the domestic sluggishness.

Anyway, compared with other mining operations, the deep-sea mining concern a great environmental impact mostly due to high risk of accidents. Environmental advocacy groups such as Greenpeace and the WWF argue that this activity should not be allowed in most of the world's oceans due to possible damage to deep-sea ecosystems and pollution by heavy metal-rich fluids. Indeed, the removal of parts of the seabed could disturb the habitat of marine organisms, with unknown long-term effects. Apart from the direct impact of mining in the area, some researchers and environmental activists have raised concerns about leaks, spills and corrosion that could alter the chemical composition of the mining area<sup>25</sup>. Moreover, In addition to the emission of greenhouse gases, offshore oil and gas operations in a sea with considerable seismic activity come with a risk of accidents and oil spills posing a real threat to the fragile Mediterranean ecosystem. Surely, we can conclude - as declared by many environmentalists and experts in the field - that the extraction of gas and oil, especially in the Mediterranean Sea poses great risks to its fragile ecosystem, so the use of renewable energy sources is the only solution to gradually replace the use and extraction of fossil fuels.

The existence of oil and gas reserves located in Algeria, Cyprus, Egypt, Israel, Italy, Lebanon, Libya and Syria motivate the presence of more than 40 refineries and petrochemical plants around the Mediterranean producing industrial chemicals (ammonia, naphtha, propylene, butane, fertilisers, etc.). However, the geographical distribution of industrial activities in the Mediterranean Basin is not homogeneous, with most industry concentrated in the northwest, particularly in Italy, France, and Spain. These industries heavily contribute to coastal and maritime pollution of the areas they are located<sup>26</sup>.

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<sup>24</sup> The issue of energy security and supply - understood as the ability to secure continuous access to resources to meet domestic demand - is a long-term goal for the European Union (see the EastMED Project). It has become of increasing interest in the wake of the Russian-Ukrainian war in 2022, which caused the outbreak of the gas energy crisis in Europe.

<sup>25</sup> On 26 September 2022, the Nord Stream pipelines 2's lines was ruptured, probably caused by several submarine blasts. As consequences the Baltic Pipe was being opened in several points and the natural gas came in from the North Sea through Denmark to Poland. The environmental impact of this accident is still not unknown, but the size of the leak can be compared with the annual methane emissions of a country like Denmark. It has been estimated that between 40,000 and 80,000 tons have been released into the atmosphere, making it biggest single methane release ever recorded. <https://www.bbc.com/news/world-europe-63057966>

<sup>26</sup> <https://www.medqsr.org/energy-gas-and-oil-exploration-and-exploitation-mining-and-manufacturing>

## Potential of the Blue Economy across the Mediterranean countries

As we saw in the previous paragraphs blue economy and its subsectors have a great potential in terms of economic development and job creation, as well as they can represent a drive for the a transition to a more sustainable environment-respectful model. But the potential of these sectors is not the same in each of the county surrounding the Mediterranean Sea, since many factors influence the



development of the sectors linked with the blue economy, among them: the geographical position, the political situation, investments, lack of infrastructures, etc. All these factors can determinate the development of one of the above-mentioned sector instead of another. What is the scenario in each of seven Mediterranean project countries?

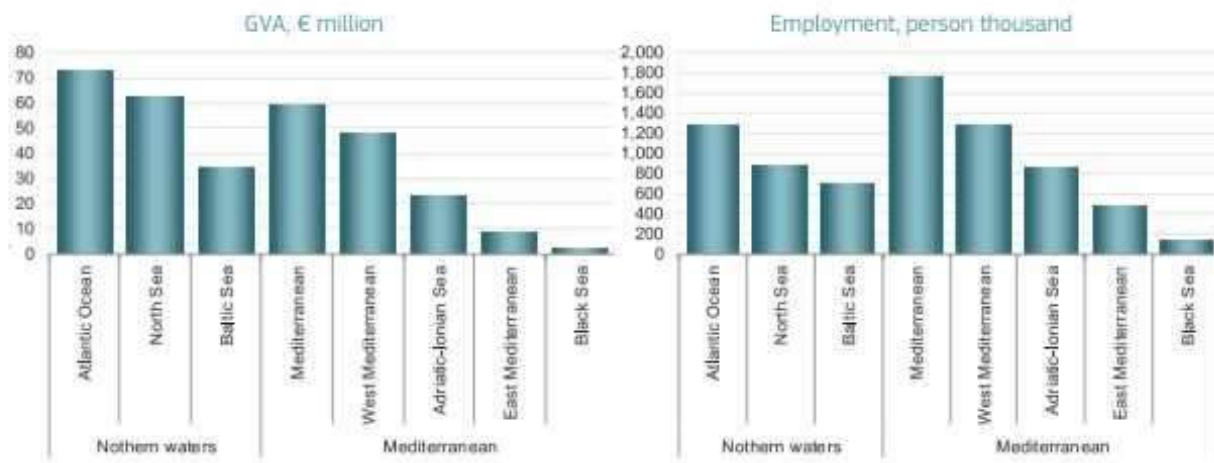
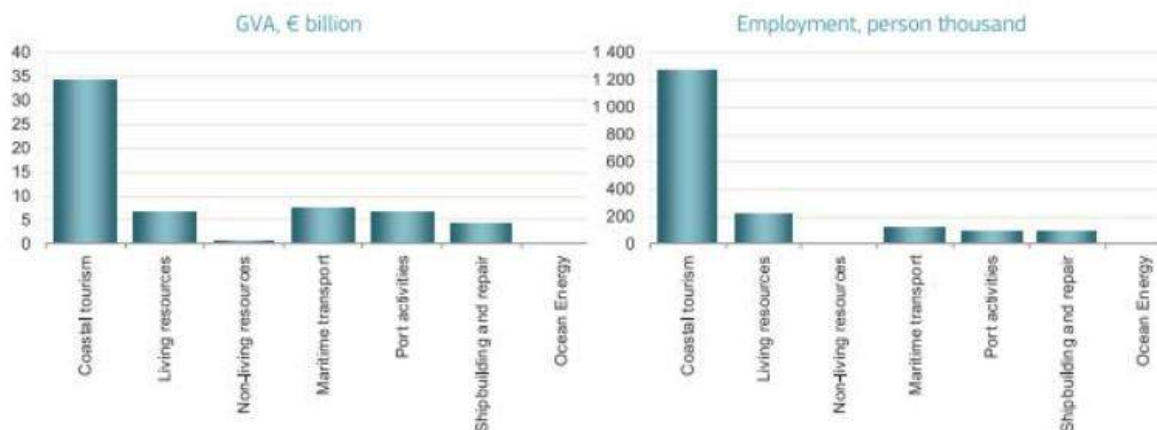


Figure 7. Employment and Gross Value Added (GVA) of the blue economy in European seas (Eurostat, DCF and Commission Services).



**Figure 8. The Mediterranean Sea basin Blue Economy by sector, 2017: Gross Value Added (GVA) and employment (Eurostat, DCF and Commission Services).**

## Spain

In 2021, the blue economy sector occupied 15,806 workers in Catalonia and generated 3,826 million euros of annual turnover, representing 4.3% of GDP and 1.4% of employment in the city of Barcelona. The sector holds important potential in terms of job creation, especially in the Catalonia's capital. Starting from 2021, the Municipality of Barcelona destined 40.5 million euros to boost the city's blue economy. The plan counts on 43 initiatives and 15 projects so that the city can be an international benchmark for innovation, sustainability and quality occupation, from the maritime economy and its multiple ramifications<sup>27</sup>.

The plan has begun to materialize, although the bulk of the municipal intervention in this period is the renewal of the Port Olympic, which in fact is 40 million euros. According to the deputy mayor of Economic Promotion, 200 jobs will be created in the blue economy sector thanks to this initiative<sup>28</sup>. What is important, however, is that this effort should act as a magnet for significant private contributions from companies, specialised investment funds and other institutions, or from Next Generation EU European funds<sup>29</sup>. In the last years, the Catalonia's government particularly focused its attention on the Blue economy opportunities and challenges by carrying out specific policies as much as possible tailored on the needs of the job market and the business operators, since policy makers are perfectly aware that several Blue Economy sectors strongly contribute to the Catalan GDP. The main outcome of the political initiative was the **Maritime Strategy of Catalonia 2030**<sup>30</sup>, aimed at orienting the development of more sustainable, inclusive and competitive Blue economy sectors in the area. In particular, these are the objectives foreseen by the document :

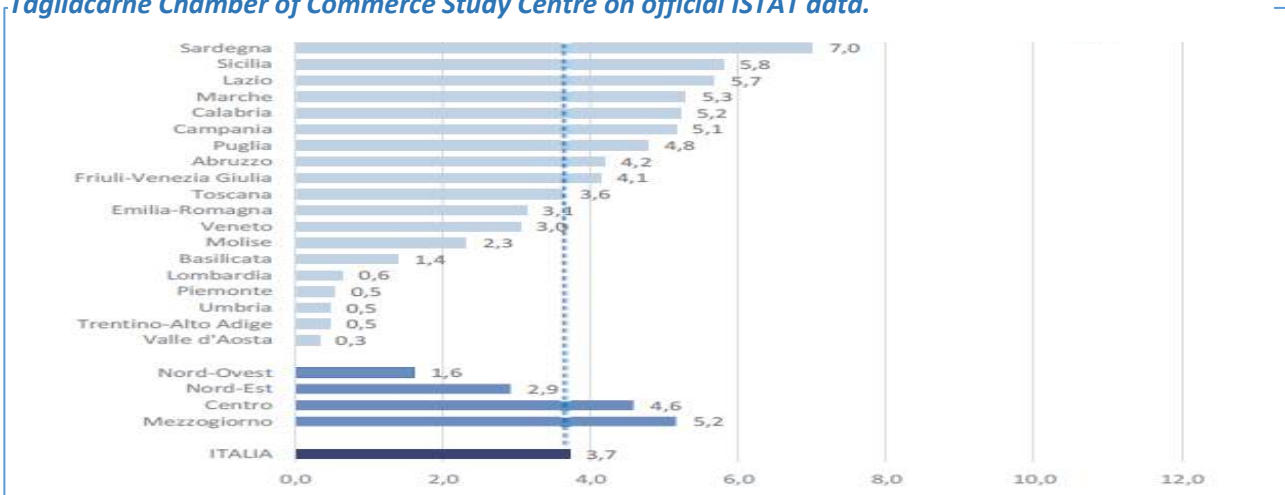
<sup>27</sup> <https://www.barcelonactiva.cat/es/-/barcelona-apuesta-por-la-economia-azul/1.7?redirect=%2Fes%2Ftodo-lo-que-esta-pasando-en-barcelona-activa>

<sup>28</sup> <https://www.elperiodico.com/es/barcelona/20201103/asi-sera-el-renovado-port-olimpic-de-barcelona-8187328>

<sup>29</sup> <https://www.elperiodico.com/es/barcelona/20211015/barcelona-destinara-52000-metros-cuadrados-economia-azul-port-olimpic-12262675>

<sup>30</sup> Estrategia Marítima de Cataluña – Plan estratégico 2018-2021, Omobook Barcelona, 2019.

**Figure 10: Contribution of Blue Economy sectors to the Italian GDP by region (2021). Source: Guglielmo Tagliacarne Chamber of Commerce Study Centre on official ISTAT data.**



- A strong, modern and well-dimensioned maritime sector, based on knowledge.
- A modern and sustainable maritime tourism
- A competitive fisheries sector committed to bio-economic management.
- Sustainable aquaculture that fully exploits the country's potential.
- A new model of recreational fishing that respects the environment.
- Maritime recreational and sporting activities with a low environmental impact that stimulate the economy.
- Sustainable industrial activity in boat building and repairs
- The development of offshore wind energy
- The development of the country's potential in marine biotechnology
- Preserved marine ecosystems
- Significant contribution to combating climate change in the maritime field
- Strengthening of the local and social economy in the maritime sectors
- The use of maritime spatial planning as a tool for achieving a maritime policy.

## Italy

According a Report delivered in 2022 by *Unioncamere* Italy ranks the 3<sup>rd</sup> position with regard to the blue economy activities' added value among European countries, with a percentage of 13.5. As already stated, the Oceans economy expresses around 176 billion euro of added value in Europe, with 4.5 million employees and a gross profit of EUR 68 billion. Specifically, Italy ranks the second position in Maritime Transport and third in Shipbuilding and Coastal Tourism<sup>31</sup>.

In Italy according the last updated report, for every euro produced by a Blue Economy activity, there is an added value produced of 1.7 euro.

With regard to Sicily the blue economy represent an asset for the local economy, in fact Sicily ranks the 3<sup>rd</sup> position concerning the percentage of incidence of the Blue Economy enterprises on the total economy, to almost 5.8% in 2021. At the same time, the percentage of the employees in the blue economy sectors in the island reaches the 5.8% out of the total, much higher than the Italian average (3.7%). As of 31 December 2021, enterprises operating in the maritime economy

<sup>31</sup> *Decimo rapporto sulla Blue Economy. La dimensione nazionale e territoriale dello sviluppo*; Unioncamere and Guglielmo Tagliacarne Chamber of Commerce Study Centre (2022).

registered in the Italian Chambers of Commerce amount to almost 225,000, nearly 3.7% of the total number of national companies. Cities as Palermo (6<sup>th</sup> position) and Messina (10<sup>th</sup>) are in the top ten list of cities with the highest number of companies, respectively 6,248 and 4,971 (closely to 5% of the national total). If we exclude those SMEs operating in the tourism and sport sector Sicily counts more than 22,000 enterprises operating in blue economy. The global GDP of the Sicilian blue economy reaches around 22.3 billion of euro per year.

If we focus our analysis on fishery and commercial fishing fleet, Sicily is the Italian leader, since it has the largest number of fishing vessels in Italy and the country has the largest fleet per Member State (14.8% of the total) as well as in the entire Mediterranean. It is important to highlight the case of Mazara del Vallo which has one the largest fishing fleet in the Mediterranean Sea consisting of 11,000 fishing vessels with a total gross tonnage of 139,000 tonnes and approximately 25,000 people employed.

Beside the fishing sector, other important activities represent an asset of the coastal and maritime economy in Sicily and some of them show interesting opportunities in term of potential development and job creation, since they have growth constantly in the last decade, despite the pandemic. Here below a short overview of the most prominent blue economy sectors in Sicily together with some recommendation<sup>32</sup>:

- **Marine aquaculture:** Sicily represent the 25% of the entire aquaculture sector in Italy. A long-term strategy that encompasses promotional activities for increasing internal and external demand, should be adopted. Links between research, industry and local communities should be promoted with the final aim to promote the diversification of fish typology and the research on Bluefin tuna reproduction in captivity.
- **Coastal tourism:** the attractiveness of Sicilian coastal destinations should be maximised and better exploited, also by improving infrastructure as well as implementing policies that promote sustainable tourism, avoiding Coastal urbanization and land degradation; water pollution and marine littering; low-quality employment and unbalanced distribution of tourism GVA;
- **Cruise tourism and Passenger ferry services:** the sector is strongly growing year by year both in western and eastern Sicily. Important investment have been done in the most important Sicilian ports. Despite an high number of ports and recreational marina the lack of infrastructures is still important to compete at the international level. For this reason is important to develop an integrated strategy encompassing all possible forms of maritime tourism, also though the use of the National recovery and Resilience Plan funds.
- **Protection of habitats and research:** The Region of Sicily has been committed along the decades in the sea and environmental protection, as proven by the establishment of several maritime protected areas across the main island and its archipelagos, among them the Aegadian Islands archipelago it's considered to be the Europe's most extensive Protected Marina Area. The commitment to maintain the biodiversity and to promote sustainable tourism

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<sup>32</sup> Study to support the development of sea-basin cooperation in the Mediterranean, Adriatic and Ionian, and Black Sea Analysis of Blue Growth needs and potential per country; EUNETMAR (2014).

practices is proven by the actions undertaken by regional and local actors as well as by policies and strict rules approved by regional and national authorities with regard to the coastal urbanisation and the land overexploitation. In fact, despite the rising flow of tourist income, the coastline haven't been particularly affected by a massive urbanisation as happened in other island or territories across the Mediterranean Sea.

### Republic of Cyprus

The Human Resource Development Authority of Cyprus (HRDA), included the blue economy in its priorities, aligning its own planning with the priorities of government policy, having recognised the promising prospects of the blue economy for economic growth and job creation. In this context, it conducted a research study, providing forecasts of employment demand in blue economic sectors and occupations, which include all economic activities related to the oceans, seas and coastal areas.

The study examines and analyses the blue economy and blue occupations, maps out the blue economy of Cyprus and identifies blue skill needs in the Cyprus economy for the period 2016-26.

The blue economy of Cyprus includes 39 economic sectors, which are grouped into six main categories. The identification of skill needs focuses on maritime, shipping, fishing and maritime and coastal tourism occupations.

The Cyprus Marine and Maritime Institute (CMMI) aims to fill a decades-long void in marine and maritime education. CMMI's CEO noted that Cyprus is lagging when it comes to offering post-graduate education in the field of marine and maritime.

- Provision of skills relevant to the labour market, in a lifelong learning continuum approach
- Development of innovative learner-centric teaching and learning methodologies
- Development of flexible, modular and learner-centred schemes facilitating mobility capabilities
- Achievement of recognition at national and regional levels

Total employment in the blue economic sectors of Cyprus during the period 2016-26 is forecasted to exhibit an upward trend. As a result in 2026, 40 518 persons or around 1 out of 10 employed persons will work in the blue economy. Total employment demand is estimated at 1 900 persons or 5,4% per year which corresponds to 14,3% of total employment demand for the Cyprus economy.

According to the Human Resource Development Authority study, eight out of ten employed persons in the blue economy will work in maritime and coastal tourism, reflecting the importance of tourism to the blue economy of Cyprus. This sector will exhibit the highest total employment demand with 1 615 persons or 5,6% per year during the period 2016-26.

The second biggest blue economic sector is maritime transport, in which one out of six employed persons of the blue economy will be working. Total employment demand will reach 253 persons or 4,3% per year during the period 2016-26. These trends are related to the strategic objective of

Cyprus for further promotion of merchant shipping as well as the pursuit for exploiting hydrocarbon deposits in the Exclusive Economic Zone of the Republic of Cyprus.

Blue Economy established sectors in Cyprus employ around 38.844 people and generate over €1.1 billion in GVA, representing a 6% share of the national economy measured in GVA and 10% of the jobs.

As an island state, it is not surprising that the Blue Economy in Cyprus is dominated by coastal tourism, which represents 86% of blue-based jobs and 81% of the GVA in 2018.

Port activities, shipbuilding and repair contribute a further 6% in terms of GVA.

In the framework of the single operational programme and the Just Transition Plan for Cyprus, the EU will invest a total of more than €1 billion in the country between 2021 and 2027. The Partnership Agreement lays down Cyprus' investment strategy for its economic, social and territorial cohesion, the green and digital transition and the development of a competitive, socially inclusive and sustainable growth model. At the same time, the Just Transition Plan will alleviate the impact of the energy and climate transition on the local economy and society.

Among the sectors to be supported, €38.3 million from the European Maritime Fisheries and Aquaculture Fund will promote sustainable fisheries and the restoration and conservation of aquatic biological resources, sustainable aquaculture, and the development of local coastal fisheries communities and the implementation of international ocean governance<sup>33</sup>.

## France

Due to its extense coastline and being the only shore for france in the Mediterranean sea, the South Region due to its central position, is considered to lead the blue economy sector and subsectors of the country. Due to its history and maritim traditions history this region got a solid expertise and economic foundation for the naval industry. These factors make the region an important territory for the Mediterranean maritime amd naval sectors, especially concerning fields such as coastal turism, shipbuilding and repairing and maritime transports.

The 'Regional Investment and Economic Development Agency' (Rising Sud,), states the blue economy accounts nearly 124,000 jobs in the South Regon and around the 30% of national jobs whitin the sector, representing 6% of the regional total employment<sup>34</sup>. If we count also its 135 ports for fishing and reacreation boats, the regioanal blue economy GDP reaches 83€ billions.

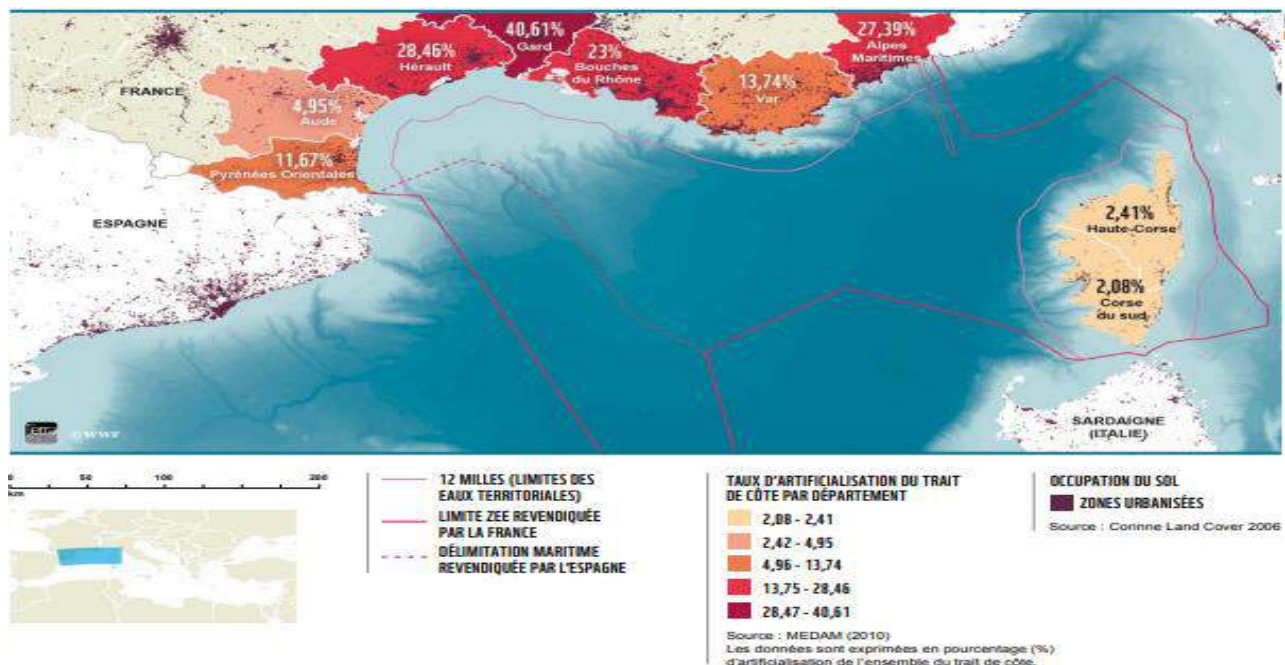
According to the WWF "Medtrends" report, with the exception of commercial fishing, all traditional sectors of the blue economy are predicted to grow over the next 15 years in the French Mediterranean, including enegy, tourism, shipping and aquaculture. Seabed mining and biotechnologies should also develop on a longer timescale. Cluster Maritime Français (CMF) estimates there are already 400,000 jobs in the French blue economy producing €70 bn worth of products annually. This is expected to rise to 1 million and €150 bn respectively by 2030. CMF also

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<sup>33</sup> [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_22\\_4326](https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4326)

<sup>34</sup> <https://www.risingsud.fr/our-sectors-of-excellence/sector-of-excellence-blue-economy/?lang=en>

states that jobs will be created in pharmaceuticals, cosmetics and food processing, and maritime tourism while climate change will create jobs in prevention and control. Pôle Emploi Régional PACA states that there are 60,000 businesses recruiting 90,000 people a year for 900 different occupations supported by 70,000 trainings. The most jobs will be in port and shipping services (56%), fishing and seafood farming (21%) and food processing (6%)<sup>35</sup>. Clic&Sea (a specialised



**Figure 11: Land utilisation rate for each French department.** platform offering job opportunities in the maritime sector) states that apart from port and shipping occupations, hundreds of thousands of jobs will be created in related industries requiring profiles such as researchers, engineers, scientists, architects and maritime communication specialists. New occupations will be created in the digital, new technology and lectronics sectors. However, the biggest profession will be renewable energy technicians to install solar/PV panels and wind turbines.

The French government and regional institutions are also committed in making blue economy professions more gender balanced and attractive (traditionally these are dominated by male employees to 60%) as a priority of its maritime policy, through a policy of training and social support, as well as career guidance. This is all underpinned by the drive to decarbonise the sector, thereby creating new technical jobs based on environmental protection and monitoring. With the aim of regulating and promoting the development of emerging sectors linked with the sea, a new French law on blue economy sectors was approved in 2016 (French law No. 2016-816 of 20 June 2016). Furthermore new vocational education and training institutions have been set up in the South Region, and among them, the Campus of Trades and Qualifications of the Sea (in French, *Campus des Métiers et des Qualifications de la Mer*), which has the main goal to offer basic

<sup>35</sup> Piante C., Ody D., 2015. Méditerranée: La croissance bleue face au défi du Bon État Écologique. Projet MedTrends. WWF-France. 168 pages.

trainings, continuous training, or apprenticeships for French people interested in the blue economy.

#### Jordan

Despite Jordan has only 26 Km of coastline on the Red Sea, the National interest in Aqaba city concerns several aspects like culture, tourism and industry, commercial trading, shipping and fishery. Moreover, as the Aqaba region and its port are considered free tax zone the potential of economic growth of Blue economy sectors is extremely high. For these reasons the Jordan government adopted all along the years specific policies concerning the development of the sector:

- Ministry of Environment Strategic Plan (2020-2022)
- Green Growth National Action Plan (2021-2025)
- National Green Growth Plan for Jordan
- National Environment Strategy for Jordan
- The National Biodiversity Strategy and Action Plan 2015 – 2020
- 'Water for Life: Jordan's Water Strategy (2008-2022)',
- The National Water Strategy for 2016-2025
- Climate Change Policy for a Resilient Water Sector
- National Water Master Plan (2005)
- The Jordan National Agenda (2005)

Certainly, the Blue economy subsectors in the Gulf of Aqaba will require a specific attention both in terms of business opportunities and employment creation, as well as in terms of environmental protection and sustainability. The following list includes some of the most prominent blue economy subsectors which haven't been exploited yet, but with a great potential of growth:

**Waste management:** the transition process to sustainability in the waste management can be led by the private sector, by applying the principles of circularity, taking into consideration that 65% of marine waste in the Aqaba Gulf is plastic waste.

**Coastal tourism:** transfer the Eco-Tourism experience to Aqaba, where it is possible to apply the circular economy to the coastal hotels and guesthouses in the city. The positive impact of this exercise will be reflected on the local community through providing job opportunities for community members. In addition, the operational cost of the hotels and guesthouses will significantly decreased.

**Renewable energy:** maritime renewable energy can present multiple benefits to the stakeholders and local community in Jordan. Whereas, the maritime power source can provide access to clean energy and meet the goals of the National Determined Contribution. In addition, the sector of renewable energy can open up tangible opportunities for businesses and jobs.

#### Palestine

Due to its geographical and political conditions, it is not possible to say that the blue economy sector is developed since the activities linked with the majority of blue economy subsectors are

very limited and not exploited, especially in West Bank. Secondly, the lack of water security and a limited access to water resources pose a great challenge for having a national plan to build sustainable blue economy especially in the West Bank. While traditionally fishery is more common in the Gaza Strip due to its coastal marine environment, in West Bank there is attempt to promote this sector in Palestine, through some initiatives by the European Union and other international organization such as the Programme of European Maritime and Fisheries Fund. However, it is a limited sector and the number of institutions and operators in it is insignificant, despite the absence of official statistics. This matter was evident during the data collection for A 3.2.1 activity, as it was difficult to find institutions and companies operating in this sector, and even the SEA and business operators reported working in this sector, showed limited or hazy activities related.

Main problems Palestinians face in West Bank concern the scarcity of water resources due to political restrictions and the desert environment. In fact, a meaningful access to and equal distribution of water has been a serious issue since the commencement of Israel’s occupation of the West Bank in 1967, and occupied Palestine territories are considered water-scarce with lower to middle-income levels in terms of water. Has been estimated that more than 650,000 Palestinians living in the West Bank have limited access to water and 74% of them are considered ‘vulnerable’. As a result, Palestinians have access only to 13% of the regional water sources<sup>36</sup>. This percentage of water is insufficient to meet the population's consumption, and therefore the possibility of expanding the activities of the Blue Economy may remain confined to the existence of a political solution to the water issue. However, on the other hand, this issue may be trigger for adaptation of circular economy and other sustainable economies, in terms of reducing water waste, reusing it, refining it, or other practices that may contribute to reducing the impact of limited access and scarcity of water.

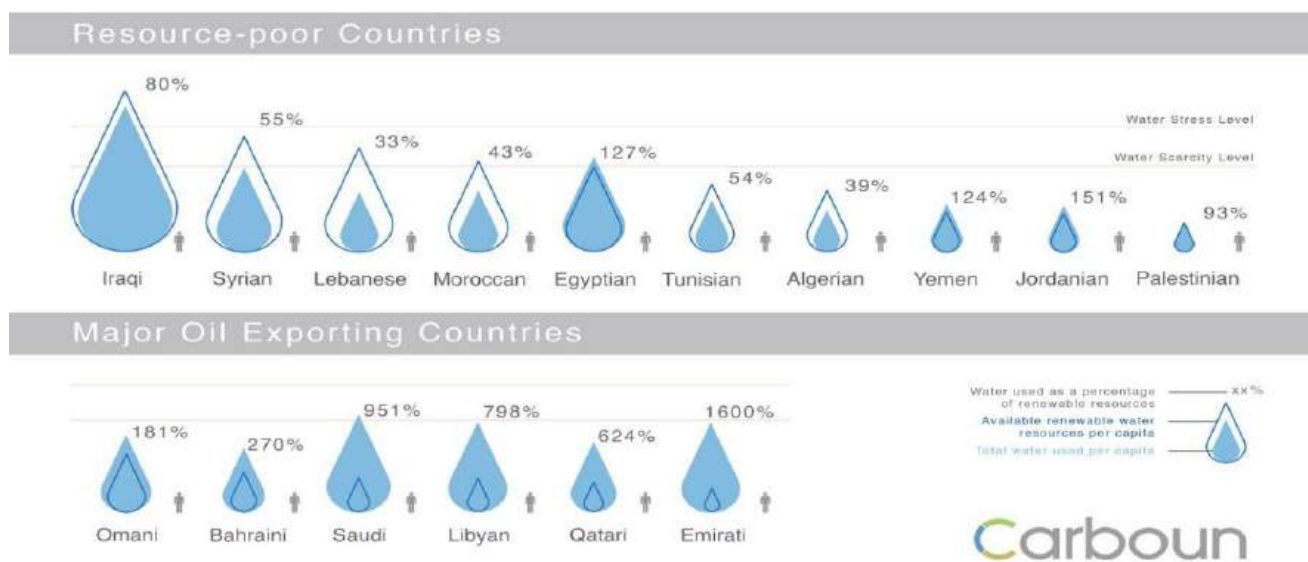


Figure 13. Water use per capita in Middle East countries (Greenprophet.com)

<sup>36</sup> <https://reliefweb.int/report/occupied-palestinian-territory/palestinian-access-water-attacks-wash-structures-area-c>

## Tunisia

Despite its 1300 km of coastline and the great potential due to its geographical location, several sectors of the Tunisian maritime and coastal economy are not fully exploited yet. In general, it can be said that fishing and coastal tourism are the two sectors that employ the most people across the country especially in the northern governorates. Among them, the governorate of Nabeul shows more dynamic activities linked with the blue economy compared with other governorates, despite its small population. The governorate is actively contributing to the national blue economy GDP, especially with regard to commercial fishery, aquaculture and coastal tourism. The region counts 4 fishing harbours with around 716 fishing boats (both for coastal and deep sea fishing) contributing up to 17% of national fish production employing 3000 workers. In recent years 5 offshore fish farms have been established for a total capacity production of 653 tonnes (sea bream and sea bass).

Nabeul, such as other seaside destinations, is also internationally known for the touristic activity, since this area counts more than 158 hotels offering 52,000 beds, representing the 22% of national touristic capacity and generating nearly 80,000 direct and indirect jobs.

Nevertheless, several opportunities offered by the maritime and coastal activities in Tunisia haven't been seized yet, as well as more sectors and subsectors could be better exploited, especially in Nabeul governorate. The seaside suffer a critical lack of infrastructures (ports, docks, etc.), which limit the creation of new business and foreign investments, as well as the high percentage of low qualified workforce represent a bounder to the creation of more specialised industrial activities.

Specific funding policies for the activities of the blue economy with the highest potential for development should be carried out by the central government and international institutions. In this way those sectors that are still not exploited in the country could be brought out. Among the sector with a great potential in terms of business opportunities and job creation there are: the sustainable tourism, shipbuilding and repairing, marine aquaculture and the cruise tourism, since it is mostly concentrated in Tunis.

Obviously, this would have to be accompanied by specific integrated action plans to be drawn up together with local institutions and coastal communities, which take into account the skills required by the market as well as the environment, while at the same time being capable of attracting foreign investment and creating new jobs.

## Towards a blue economy

As World Ocean Initiative (WOI) highlighted in a recent report on a sustainable ocean economy in 2030<sup>37</sup>, the blue economy is more than the ocean economy. By "blue economy" we mean a sustainable ocean economy that harnesses ocean resources for long-term economic development

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<sup>37</sup> A sustainable ocean economy in 2030: Opportunities and challenges; The Economist Group Limited (2020); <https://ocean.economist.com/blue-finance/articles/world-ocean-day-explores-blue-economy-and-private-sector-impact>

and social prosperity while protecting the environment in perpetuity. Hence the blue economy is about harnessing opportunities for creating jobs, income and growth, but also restoring ocean health.

Public institutions, local communities, investors and private companies can represent the key stakeholders able to boost the 'blue transition' towards clean and low-carbon technologies, capable to generate new employment as well as preserving the marine and coastal environment. Solutions to marine plastic pollution, recycling of waste, a more sustainable cargo shipping, as well as is the ocean's potential to remove carbon from the atmosphere and increase resilience to the impacts of climate change, must be taken into account if we want to exploit future opportunities offered by the blue economy and its related sectors.

Having said that, what sectors demonstrate the most prominent opportunities in terms of sustainable socio-economic development and job creation, able to enhance the growth of the Mediterranean region?

### Impact of the Covid-19

The coronavirus pandemic has had a deep impact on the ocean economy. Few years ago, right before the pandemic, the OECD estimated that ocean's contribution to the global economy will double in size by 2030 compared with 2010 levels, raising up to an estimated value of 2.5 trillion US per year providing full-time employment for around 40m people around the world, becoming the world's seventh-largest economy sector<sup>38</sup>.

On the other side, due to the Covid-19 pandemic several Blue economy sectors have been strongly affected by the consequences of the pandemic and by the restrictions to the local and international mobility imposed by different governments across the planet. Many of these sectors have suffered a contraction in their business more than during the global financial crisis in 2008-2011.

In 2020 and 2021, sectors as coastal tourism, passenger ferry and cruise tourism have been particularly affected by the pandemic and its consequences in terms of business and employment. At the same time, the COVID-19 outbreak shown to the entire world the increased importance of supply chains in responding to society's needs in real time and in the transportation of goods, whether in managing the increase in online retail demand or maintaining the supply of medical supplies and fresh products. Policy makers, institutions and private companies are aware that logistics needs to evolve to build stronger supply chains, with the final aim to achieve a higher level of food security, health and stability, keeping in mind the importance of creating more sustainable supply chains, respectful both of the environment and the local communities<sup>39</sup>.

This is just one example of several challenges that the pandemic has presented us and faced by the Mediterranean communities over the last two years. As everyone knows by now, however,

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<sup>38</sup> <https://woi.economist.com/sustainable-ocean-economy-2030/>

<sup>39</sup> Mediterranean transport and logistics in a post-covid-19 era: prospects and opportunities, IEMed (2021)

the ability to cope with the difficulties of the pandemic and the current war in Ukraine also depends on the opportunities offered by the ecological transition and innovation. In this sense, the blue economy offers many opportunities that every stakeholder should catch. With this regard, the maritime transport, responsible for moving more than 80% of goods and raw materials particularly affected by the lockdown measures imposed by the national authorities, must play an important role in boosting the green transition, especially reducing the water pollution.



There is still a long way to go to make the transition to a more sustainable and inclusive blue economy effective. To do this, the collaboration of all economic and social actors is necessary, starting with political decision-makers, businesses, educational institutions, NGOs, as well as it is essential to raise the awareness of the general public about the importance of respecting the environment and the need to reduce pollution. The concrete actions that local, national and European institutions must carry out certainly include a greater allocation of funds for 'blue finance' and the use of new technologies capable of limiting the impact of human activities across the Mediterranean Sea, which has been and will continue to be the busiest and the most exploited sea in the world. In the United Nations Decade of Ocean Science for Sustainable Development<sup>40</sup> (2021-30) and in view of achieving the goals of the UN 2030 Agenda<sup>41</sup>, it will be crucial to promote new and concrete opportunities for the private sector to support a blue economy, increasingly respectful of the marine environment and local communities, but which could represents the driving force of economic development of the Mediterranean region<sup>42</sup>.

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<sup>40</sup> <https://www.oceandecade.org/>

<sup>41</sup> Fisheries and aquaculture in the Mediterranean and the black sea: an updated analysis of the impacts of the covid-19 crisis; General fishery Commission for the Mediterranean; FAO (2020); <https://www.fao.org/3/ca9902en/CA9902EN.pdf>; <https://www.un.org/sustainabledevelopment/development-agenda/>

<sup>42</sup> [https://www.wwfmmi.org/what\\_we\\_do/blue\\_economy/](https://www.wwfmmi.org/what_we_do/blue_economy/)

# GREEN ECONOMY

## Sector overview

Green economy is defined as low carbon, resource-efficient and socially inclusive economy aimed at reducing environmental risks, managing ecological scarcities, promoting at the same time, sustainable and fair development without damaging the environment. Green economy models are driven by the goal to promote employment and income through private and public investments that take into consideration the reduction of carbon emissions and pollution, as well as energy and resource efficiency and biodiversity preservation.

The International Chamber of Commerce (ICC), which represents global business worldwide, defines green economy as "an economy in which economic growth and environmental responsibility work together in a mutually reinforcing fashion while supporting progress on social development"<sup>43</sup>.

For these reason the green economy approach question the traditional model of the economic development based on the exploitation of natural resources, starting from the extraction of raw materials, transformation, long-distance transport and consumption, which does not considers all the consequences in terms of environmental footprint, overexploitation and unacceptable environmental costs. Basically, the green economy provides a macro-economic approach to sustainable economic growth with a central focus on investments, employment and skills. For this reason, Sustainable Consumption and Production as well as Resource Efficiency are the key approaches needed to promote sustainable economic development, thanks to reduction of resource consumption, waste generation and emissions across the full life cycle of processes and products<sup>44</sup>.

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<sup>43</sup> International Chamber of Commerce – ICC. *Green Economy Roadmap. A guide for business policymakers and society*. 2012.

<sup>44</sup> United Nations Economic Programme (UNEP) <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>

The activities following this economic model are thus defined 'green', since they are strongly linked to the defence of the territory and the planet, for example by using renewable energy

*"The potential of the Mediterranean region is considerable. Renewable energies can be the catalyst for sustainable growth in the region. Hydroelectric resources and wind energy, without forgetting solar energy and the great expanses of desert where you can install panels. The region could satisfy its energy needs with solar power alone. The total investment planned in the renewable energy sector, up to 2030, is around 250 billion dollars. Economic wealth can grow in the Mediterranean, giving importance to its economy and its population."* (Anwar Zibaoui – General coordinator of ASCAME)

sources or other means for reducing the environmental impact.

According several organisation and experts involved in combatting climate changes and pollution, the Green Economy concept has to be based primarily on different principles<sup>45</sup>, needed to achieve the objective of a greener, fair and inclusive economy, able to provide a better quality of life for all within the ecological limits of the planet. With this regard, the Green Economy Coalition established 9 principles:

1. The Sustainable Principle. Sustainability must be a driver for a sustainable and fair development from environmental, social and economic point of view.
2. The Justice Principle. Green Economy aims at promoting equity within and between generations. It is inclusive, non-discriminatory, gender balanced and gives equal opportunity to all.
3. The Well-Being Principle. It focuses on growing wealth that will support the wellbeing of all the citizens and is built on collective action for public goods, yet gives importance to individual choices, with the final aim to create genuine prosperity.
4. The Healthy Planet Principle. It highlight the need of restoring lost biodiversity, investing in natural systems and rehabilitating those that are degraded.
5. The Inclusion Principle. A green, fair and inclusive economy is inclusive and participatory in decision-making.
6. The Good Governance Principle. A Green Economy model has to be guided by integrated, accountable and resilient institutions committed at promoting global policy coherence, fair international cooperation, human rights standards and environmental agreements.

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<sup>45</sup> These nine principles of the green economy have been drafted by the Green Economy Coalition in 2012, after a consultation based on what an inclusive and truly green economy should look like. This involved hundreds of policy analysts, community activists, academics, and thinkers on equality, sustainability, and economics <https://www.greeneconomycoalition.org/news-and-resources/sign-9-principles-green-economy>

7. The Resilience Principle. A green, fair and inclusive economy contributes to economic, social and environmental resilience supporting the development of social and environmental protection systems taking into account different contexts and cultures.
8. The Efficiency and Sufficiency Principle. It focuses on supporting sustainable consumption as well as sustainable production.
9. The Generations Principle. A green, fair and inclusive economy invests for the present and the future promoting equitable education at all levels promoting long-term priorities.

In recent years, many companies and businesses across the Mediterranean region have switched to greener and more sustainable model of business and production thanks to the policies implemented by the European Union and incentives and funds aimed at promoting green initiatives.

With this regard, the 'European Green Deal' is considered the main pillar of the Europe's new growth strategy, aimed at transforming the euro-Mediterranean region, into a more resource-efficient, competitive and equal society by boosting the so-called 'green transition'. The European Green Deal aspire to make Europe climate neutral by 2050, through a massive use of green technology, creating more sustainable industry and transport, reducing pollution and the exploitation of natural resources, creating at the same time new employment and high-quality job opportunities. Definitely, the European Green Deal will turns such challenges into opportunities by enhancing the 'green growth', making the transition 'just' and inclusive for all.

Many of the 17 Sustainable Development Goals included in the 2030 Agenda for Sustainable Development<sup>46</sup> are centred on Green Economy principles, among them:

- End hunger, achieve food security and improved nutrition and promote sustainable agriculture (Goal 2);
- Ensure access to affordable, reliable, sustainable and modern energy for all (Goal 7);
- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (Goal 9);
- Make cities and human settlements inclusive, safe, resilient and sustainable (Goal 11);
- Ensure sustainable consumption and production patterns (Goal 12);
- Take urgent action to combat climate change and its impacts (Goal 13);
- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (Goal 15).

In the EU 27 the impact of Green Economy and its sectors is still limited representing the 2.2% of the total GDP in 2017, but constantly growing, outperforming the overall economy growth: 3.2% annual growth vs. 1.4% in 2000-2017. Moreover, according the EC data the GVA of the

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<sup>46</sup> <https://sdgs.un.org/goals>

environmental economy increased by 253% in 20 years, from €129 billion in 2000 to €326 billion in 2019<sup>47</sup>.

Furthermore, in terms of employment and job creation jobs linked with green economy grew up to 4.5 million in 2019 (from 3.1 million green jobs in 2000)<sup>48</sup>.

Considering this scenario, when we focus our attention on the Mediterranean basin, it is essential to keep in mind that this macro-region is widely recognised to be one of the world's most sensitive environmental, political, social, economic and cultural hotspots. Several phenomena affect its fragile natural ecosystem mostly damaged by human activity and climate change.

Green economy sectors according to scientists, observers as well as decision makers can provide to Mediterranean countries effective opportunities to enhance their economic development, thanks to the transition to a greener and equal development model. Despite all the problems characterising countries surrounding the Mediterranean basin such as land degradation, pollution, overexploitation of natural resources, overpopulation, social inequality, political instability, etc., our countries should enjoy the chance to rethink their model, taking advantage of the opportunities offered by the Next Generation EU funds and other programs. In this historical moment, as never happened before, public opinion, policy makers and other stakeholders feel the need to direct national and regional core economic activities towards a more equitable and sustainable economic development. In fact, following the principles of the Green Economy ensuring a sustainable development is the only solution to safeguard the territories surrounding the Mediterranean and guarantee a better future for the new generations.

Furthermore more and more stakeholders get awareness about the opportunities offered by the Green Economy model and its related sectors, not only in terms of reduction of greenhouse emissions or preserving the environment but also in creating new business and job opportunities.

Moreover, keeping into account all the related sectors, UNEP states that the Green Economy is a net generator of decent jobs, adequate wages, safe working conditions, job security, reasonable career prospects and rights for workers.

Karl Burkart One of the most significant scientists in this field defines Green Economy as based on six main sectors: Renewable energy; Green buildings; Sustainable transport; Water management; Waste management; Land management.

- Renewable energy**
- Green buildings**
- Sustainable transport**
- Water management**
- Waste management**
- Land management**

## Green Economy sectors' needs, perspectives and threats

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<sup>47</sup> EUROSTAT [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental economy %E2%80%93 statistics on employment and growth&oldid=557237#Employment by environmental domain](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_economy_%E2%80%93_statistics_on_employment_and_growth&oldid=557237#Employment_by_environmental_domain)

<sup>48</sup> EUROSTAT [https://ec.europa.eu/eurostat/databrowser/view/env\\_ac\\_egss1/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/env_ac_egss1/default/table?lang=en)

More and more entrepreneurs are turning their business model into a new one based on green economy principles, also by exploring new emerging sectors, as well as an increasingly number of job seekers look for positions linked with green economy sectors, the so called 'green jobs'. Considering the Mediterranean basin, many of these opportunities come from the agri-food sector, renewable energies and technologies (especially the industry 4.0).

From the questionnaires' results, we have been able to see that the SMEs and associations operating in the green economy sector in many project countries believe that the following are essential skills to work in this specific sector:

- Innovation
- Autonomy
- Dynamism
- Communication skills,
- Educational background
- Team-working skills
- Self-confidence

The Forética report "Jobs 2030" identifies the 5 most in-demand green skills and competencies and the categories to which they belong:

- Sustainability (sustainable development)
- Remediation (environmental remediation)
- Risk prevention (environmental policy)
- Climate (ecosystem management)
- Renewable energy (renewable generation)

According to the report, the sectors where there is more current presence of green skills are agriculture and fishing, construction and building, and energetic industry.<sup>49</sup>

There are different ways through which decision makers and other important stakeholder as well as the general public can contribute to the development of a Green and Sustainable Economy while meeting the needs of the market and those companies investing in the green transition:

- Establishment of frameworks to regulate and promote green investments
- Removal of Environmentally Harmful Subsidies (EHS)
- Increase investments into new and more sustainable technologies and research
- Building capacity through training and technology transfer
- Transformation of consumption patterns as a whole
- Boosting consumer's awareness about the need of changing their habits
- Implementation of programmes centred on focus inclusion and poverty reduction
- Enhancement of the collaboration between the private and public sector

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<sup>49</sup> Forética (2021), Clara Jiménez-Becerril, Marta Cámara y Ricardo Trujillo, "Jobs 2030" [https://foretica.org/wp-content/uploads/informe\\_jobs\\_2030\\_empleo\\_verde\\_transicion\\_justa.pdf](https://foretica.org/wp-content/uploads/informe_jobs_2030_empleo_verde_transicion_justa.pdf)

## Potential of the Green Economy across the Mediterranean countries

In the EU 27 the impact of green economy its sectors and subsectors is still limited representing the 2.2% of the total GDP in 2017, but constantly growing, outperforming the overall economy growth: 3.2% annual growth vs. 1.4% in 2000-2017.

Furthermore, in terms of employment and job creation jobs linked with green economy grew up to 4.5 million in 2019 (from 3.1 million green jobs in 2000)<sup>50</sup>. Therefore, the employment in the environmental sector also grew much faster than in the overall economy (by 32% between 2000-2016 versus 9% overall), due to the green sector's expansion up to 2011, with an annual growth nearly to 3% a year (on average).

With regard to green economy sectors 40% of the value added was generated in energy and water supply, sewerage and waste services, 21% in construction and repairing, 19% in services, 12% in mining, quarrying and manufacturing and 7% in agriculture, forestry and fishing (2017).

If we consider each environmental domain (across NACE<sup>51</sup>), 39% of the total green value added relates to energy management, 27% to waste management, 13% to wastewater and 17% to other environmental protection. By domain groups, the environmental protection grew (with around 3% annual growth) to EUR 166 billion in 2017 (1.3% of GDP), compared to EUR 99 billion in 2000. Resource management started lower (EUR 31 billion, 0.4% of GDP), but with a more rapid growth (over 8% per annum), it reached EUR 121 billion (0.9% of GDP) by 2017, via the expansion of renewables and energy saving.

At the same time, if we consider the expenditure on environmental protection by households, enterprises, public institutions, etc. in the 27 EU countries, it reached a total amount of 269.1 billion Euro in 2019, corresponding to 1.9% of EU GDP<sup>52</sup>.

As demonstrated by the abovementioned statistics, investments and business, as well as employment rate in green economy sectors is constantly growing since early 2000, demonstrating a great potential in terms of business opportunities and job creation being probably the most prominent macro sector in the next decades, offering unique opportunities for the socio-economic development of the Mediterranean countries.

In order to catch these opportunities it is essential to adequately turn the abovementioned challenges (pollution, climate change, overexploitation, etc.) into business opportunities that can contribute to a sustainable energy transition.

In order to ensure the development of the green economy strategies across the Mediterranean region, it is important to point out the most useful recommendations that should be adopted by each country. By following these recommendations, the Mediterranean countries could have the chance to achieve several of the UN 2030 agenda goals, with the final aims to preserve the environment and biodiversity, reduce the pollution (particularly characterising the coastal areas),

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<sup>50</sup> EUROSTAT [https://ec.europa.eu/eurostat/databrowser/view/env\\_ac\\_egss1/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/env_ac_egss1/default/table?lang=en)

<sup>51</sup> NACE is the acronym of 'Statistical classification of economic activities in the European Community'; is the classification of economic activities in the European Union (EU); the term NACE is derived from the French Nomenclature *Statistique des Activités économiques dans la Communauté européenne*.

<sup>52</sup> European Commission. *Green growth, jobs and social impacts fact sheet*. (2020).

[https://ec.europa.eu/environment/envec/pdf/FACT\\_SHEET\\_ii\\_Green\\_Growth\\_Jobs\\_Social\\_Impacts.pdf](https://ec.europa.eu/environment/envec/pdf/FACT_SHEET_ii_Green_Growth_Jobs_Social_Impacts.pdf)

promote the use of renewable energy sources, to stimulate an equal and fair economic development, boosting social inclusion and reducing poverty. Recommendations are as following:

**Align and mainstream Green Economy/Sustainable Development concepts:** Mediterranean countries and international organisations have to express more clearly their interpretation of green economy and Sustainable Development, in order to better design policies and development strategies based on recognized international standards/agreements, economical perspectives and scientific literature. Environment protection, biodiversity preservation, social equity, community development and sustainability, should be considered as the core concepts of national green economy strategies. In addition, Mediterranean countries must put a special attention to those sectors particularly influencing the environment, the economy and the entire society, such as coastal and marine related activities, Tourism, Fisheries, Constructions and Transport, etc.

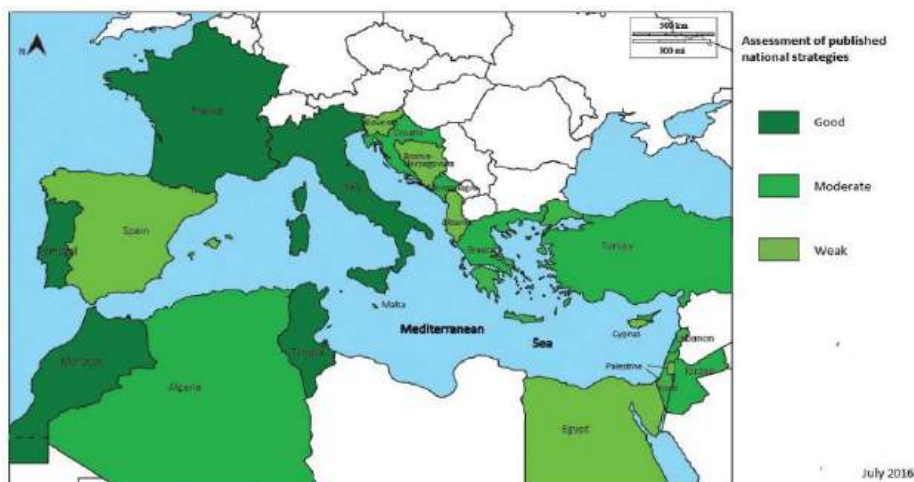
**Clearly formulate objectives, actions and indicators:** It is important that Mediterranean countries improve their national strategies, also coordinating each other, with the final aim to have a common vision, objectives and implements same actions since Mediterranean is 'only one creature'. Definitely, it is essential to link each national strategy to common goals, actions and indicators integrating into a common Mediterranean strategy for sustainable development.

**Raise awareness about national and regional sustainability strategies:** Northern and southern Med countries need to put more effort in communicating and disseminating national green economy strategies (especially the most successful ones) to all relevant stakeholders, including economic actors, opinion leaders and citizens, also showing the benefits of a different and sustainable development model. Civil society has to play a 'watchdog' role both with regard to the right implementation of sustainable development policies and in contrasting private interests in brown economy of lobbies or other pressure groups.

**Catalyse and mainstream Green Finance and Phase out 'brown' incentives and initiatives:** Public funding of green economy are extremely important to promoted initiatives, both at local, national and regional level, aimed at boosting the 'green transition'; e.g. through the launch of green public banks as they exist in some country. Policy makers in Med countries have to support sustainable and responsible investments, in particular for households (energy efficiency), SMEs (green businesses) and big enterprises. Green Bonds programmes could be launched at the international level also with the support of the Central European Bank and central national banks, with the aim to promote investments and provide access to finance for green initiatives and infrastructures. Tax systems should be reviewed, in order to increase tax rates to activities or business that damage the environment (brown economy) and reducing it for initiatives which include green economy actions. Surely, initiatives that affect environmental and social sustainability with no positive effects or non-equitable benefits on the environment and social inclusion, have to be stopped to avoid wasting precious natural and financial resources and send the right messages to the market and decision-makers.

**Pursue regional cooperation and peer learning:** International cooperation in green economy should be further strengthened at the Mediterranean level. International stakeholders such as UNEP/MAP, the UfM Secretariat or OECD should focalise their attention more on strengthening the cooperation between the two shores of the Mediterranean, with a special attention to the south economies. Since early 2000 the European Union has been committed in boosting the cooperation with southern and eastern Mediterranean countries through specific programmes as ENI CBC MED, Interreg Med or Horizon 2020 aimed at improving the research, cooperation, policies and joint initiatives supporting the cross-border dialogue and progress on Green Economy and Sustainable Development. Peer exchanges and learning

mechanisms between national and international stakeholders as well as among national peers are strongly encouraged.



**Figure 12: Assessment of national strategies in the Mediterranean.**

Methodology used to assess these national strategies, policies and initiatives involved several stakeholders and followed four steps, including a

### Spain

The Spanish Strategy for Sustainable Development is considered weak compared to actual standards. At the time of publication, it was well defined, but now it is too old to be really relevant. Spain has not promoted any new initiative to implement a GE or SD strategy in the last ten years.

### Italy

Italy has a good strategy because in 2015 it published a law on Green Economy, which is very relevant and sets up a real framework policy to develop GE measures in Italy. The National Strategy for Sustainable Development published in 2002 is outdated but complete and detailed with sustainability relevant measures<sup>53</sup>.

There are 372,000 companies that have converted to a greener style of production, of which more than 31,000 in 2015 alone, a leap of 36% over the previous year. Eco businesses account for 1/4 of non-agricultural businesses and 10.3% of production. The highest rate of green companies is in the manufacturing sector, which accounts for 32% of companies with a particular sensitivity to the environment. This also has a positive impact on employment levels, in fact, companies are increasingly looking for specific skills in this area and new hires with 'eco' skills number 294,000<sup>54</sup>.

### Republic of Cyprus

Cyprus's National Strategy of Sustainable Development is quite old (2007) and superficial; it is weak and hardly relevant in terms of sustainability.

<sup>53</sup> Fosse J, Petrick K. et al., 2016. *Towards a Green Economy in the Mediterranean - Assessment of National Green Economy and Sustainable Development Strategies in Mediterranean Countries*. Eco-union, MIO-ECSDE, GEC. Athens, 2016.

<sup>54</sup> <https://www.progettosud.org/it/blog/561-la-green-economy-in-italia-e-le-prospettive-future.html>

## France

France's National Strategy for Sustainable Development 2015-2020 is good because it is a very complete and relevant framework for policies. The goals are clear and detailed with monitoring indicators for each goal. All the sectors are well covered except tourism and fisheries.

## Jordan

Jordan's strategy is considered moderate. Even if the country does not have a specific GE strategy, Jordan shows a clear intention of pursuing more sustainable development plans. It has incorporated the principle of SD in its specific strategies and it is currently preparing a National Green Growth Plan, which will set a cross-sectorial GE framework<sup>55</sup>.

## Palestine

Palestine is the only country in this report that does not enjoy an effective permanent sovereignty over its natural resources, a condition that limits the planning capabilities of Palestine and the successful completion of its objectives. Brown economy: Israel provides to Palestine energy mostly derived from fossil fuels. Israel has plans to extract natural gas from the Leviathan gas reserve in the Mediterranean Sea, in order to provide energy for both Israel and Palestine<sup>56</sup>.

## Tunisia

Tunisia has been adopting a legislative and regulatory framework to finance investments in renewable energy, energy efficient and other environment-friendly technologies. It is mainly counting on multilateral institutions and government funding. In fact, businesses investing in green sectors can receive financing from international credit lines, grants and national funds.

Tunisia's policies ensure the involvement of commercial banks, simplifying administrative procedures and creating reliable quality management. The combination of a suitable and affordable finance mechanism, a simplified administrative procedure and an extensive quality verification system with penalties for failure, ensures repayment of product loans to financial institutions. Moreover, the introduction of mandatory energy audits for energy-intensive companies, together with subsidies for subsequent energy efficiency measures through the national fund for energy conservation, has increased awareness of the financial benefit of energy efficiency and led to substantial investments in energy efficiency by the industry.

## Impact of the Covid-19

As everyone knows the Covid-19 pandemic deeply affected our lives and our daily routines, influencing several aspects at every level of the society. Many businesses operators and workers across the Mediterranean countries faces difficulties caused by the health crisis, mobility restrictions and border closure. The outbreak strongly impacted on the Green Economy sectors, especially in 2020 and 2021 when many companies, local and national authorities decided to shift

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<sup>55</sup> Fosse J., Petrick K. et al. *Towards a Green Economy in the Mediterranean - Assessment of National Green Economy and Sustainable Development Strategies in Mediterranean Countries*. Eco-union, MIO-ECSDE, GEC. Athens, 2016.

<sup>56</sup> *Ibid.*

funds earmarked for the ‘green transition’ to the health care system with aim to cope with the pandemic.

Further threats are caused by the Ukrainian-Russian war, which leads to great uncertainty in the forecasting scenarios for the coming years, due to the economic consequences of the war and the related sanctions to the Russian economy. Sanctions and inflation are particularly affecting Agriculture and the Green Economy-related sectors, due to the increasing price of the energy and shortage of raw materials as well as the cut of exportations of agri-food products to the Russian market.

The ‘Italian Alliance for the Sustainable Development’ (ASviS) a no for profit organisation, carried out an analysis about the impact of Covid-19 on the 2030 Agenda for Sustainable Development goals, through a qualitative assessment of the more than 100 indicators used to elaborate the composite indices of the 17 Sustainable Development Goals. The scenario shows how for several Agenda 2030 goals the expected impact is largely negative (e.g. Goals 1 - poverty, 4 - education, 8 - economic and employment conditions, 9 - innovation); while for some of them linked with sustainable development and the Green Economy (7 – clean energy for all and 13 – fight against climate change) a moderately positive trend can be expected. Although it does not exclude that, there may be a negative impact of the crisis on various aspects of sustainable development in the future<sup>57</sup>.

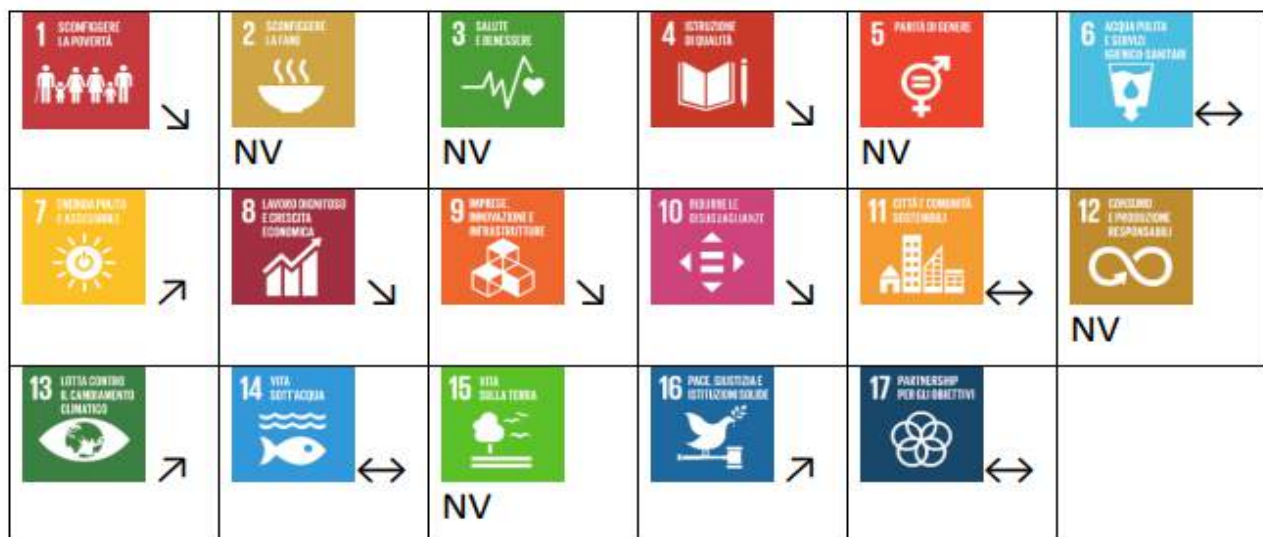


Figure 13. Assessment of the effects of Covid-19 on the objectives of the 2030 Agenda. Source: ASviS

In such euro-Mediterranean context characterised by the pandemic and the consequences of the Ukrainian war, it will be crucial to ensure as much as possible the free flow of goods and products internationally, while securing quality jobs and fair and sustainable development within Mediterranean territories. In fact, since 2020, in addition to problems related to the supply of energy, raw materials and foodstuffs, there has been a deterioration in workers' conditions, especially in the agri-food sector. For these reasons, the International Labour Organisation (ILO)

<sup>57</sup> See more details at: ASviS. *L'impatto della crisi da Coronavirus sullo sviluppo sostenibile in Italia. 2020.* [https://asvis.it/public/asvis2/files/Pubblicazioni/ValutazioneCrisiFinal\\_def.pdf](https://asvis.it/public/asvis2/files/Pubblicazioni/ValutazioneCrisiFinal_def.pdf)

has set an agenda for 'decent work', increasingly recognised as an effective tool to alleviate poverty and food insecurity, providing a basis for a regulatory framework for global development. This agenda has four basic pillars<sup>58</sup>:

1. Stimulating the economy and employment to support agri-food enterprises, stimulating production and ensuring that workers continue to receive decent salaries and other benefits, in accordance with existing collective agreements and/or relevant laws.
2. Supporting enterprises, jobs and incomes. The seasonality of agricultural production adds the need of extending social protection coverage to agriculture workers who have traditionally been excluded from national labour protection laws, not only in southern countries but also in EU Med countries. The prevailing informality and the lack of infrastructure and services in rural areas especially in countries as Tunisia, Palestine or Jordan have hindered access to social protection services.
3. Protecting workers in the workplace. It should be mandatory to ensure that all agricultural workers can access essential health care services, including testing, in order to guarantee their safety and health in the workplace. All workers whether temporary, seasonal or migrant workers, independently of their legal status or gender, have the right to work in safe and healthy conditions. In reality, many workers in agriculture even in EU countries, often do not have access to appropriate personal protective equipment, water and sanitary facilities.
4. Relying on social dialogue for solutions. As ILO claims many times, political stakeholders in Med countries have to recognize the importance of associating rural workers' organizations by helping them through tailored political actions and regulations, in order to improve permanently and effectively rural workers' conditions both personally and professionally.

Overall, the Mediterranean scenario with regard to the impact of Covid-19 and the consequences of Ukrainian war considering sectors linked to the Green Economy and sustainable development is particularly fragmented, presenting various weaknesses, but also many strengths.

In recent months, due to the Russian-Ukrainian war, the energy crisis that is affecting Europe is considered as a treat for the so-called 'green growth'. Right now, business operators, social actors, policy makers and the general public are more and more aware about the consequences of the war. In fact, all the stakeholders recognise that cut in gas supplies, risks jeopardising not only the economies of the countries bordering the Mediterranean basin, which are still largely dependent on traditional energy sources, but also it may change policies of many Mediterranean states. It might be push national governments to return to financing traditional energy sources and fossil fuels such as oil, natural gas and even nuclear energy, reducing at the same (or even stopping) investments in renewable and clean energies such as wind or solar power, effectively curbing the green transition.

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<sup>58</sup> [https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-lisbon/documents/event/wcms\\_667247.pdf](https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-lisbon/documents/event/wcms_667247.pdf)

# CIRCULAR ECONOMY

## Sector overview

Circular economy is a production and consumption model that is based on sharing, reusing, repairing, reconditioning and recycling of existing materials and products for as long as possible. Essentially, it is a development strategy aimed at minimising the exploitation of raw materials by reusing them and placing them in a continuous circle. It is a system that regenerates itself, whereby the product does not reach the end of its life cycle (as linear economy does) because it is reused. Such model extends the life cycle of products and helps to minimise waste.

Another significant definition was given by the activist Ellen MacArthur founder of the MacArthur Foundation which considers the circular economy "an economy designed to regenerate itself. [...] The circular economy is therefore a system in which all activities, starting with extraction and production, are organised so that someone's waste becomes a resource for someone else"<sup>59</sup>.

The growth of the circular economy is crucial for the environment, as it is estimated, according to the Circular Economy Network report, that doubling the 'circularity' rate of the world economy from the current 8.6% to 17%, globally 22.8 billion tonnes of greenhouse gases could be cut<sup>60</sup>.

This model can divide the economic activity and business from the consumption of finite resources. Definitely, it is a resilient and alternative system that is good for business, people and the environment. The circular economy is based on three main pillars that characterise this model<sup>61</sup>:

- 1. Eliminate waste and pollution**
- 2. Circulate products and materials (at their highest value)**
- 3. Regenerate nature**

## The principles of the Circular Economy

For sustainable production and lifestyles to be possible, the entire production process must be based on certain fundamental principles, which can change the entire production process, starting from the design of the products to their disposal and recycling.

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<sup>59</sup> <https://www.macfound.org/>

<sup>60</sup> The circular material utilisation rate is defined as the ratio between the circular use of material and the total use (i.e. use from virgin raw materials and recycled materials). Ronchi E., Leoni S., Vigni F., Pettinao E., Galli L., Erme A.; 4° *rapporto sull'economia circolare in Italia (sintesi)*, Circular Economy Network, 2022.

<sup>61</sup> [https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview?gclid=CjwKCAjwv4SaBhBPEiwA9YzZvHNiFNE8g3RpgU1TNik26uOUNBTMqAYT4jjoip354ftE2OTyRrah5BoC\\_KAQAvD\\_BwE](https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview?gclid=CjwKCAjwv4SaBhBPEiwA9YzZvHNiFNE8g3RpgU1TNik26uOUNBTMqAYT4jjoip354ftE2OTyRrah5BoC_KAQAvD_BwE)

## **1. Eco-Design**

The revolution starts from product design. Despite the product design can appear not so important, waste and pollution are consequences of wrong decisions made in the design phase, where about 80% of the environmental impact of our actions is determined.

By changing our mind-set and exploiting new materials and production technologies in the production phase, we can strongly limit the waste and the pollution. We have just to change our mind-set and to consider the possibility that an object can have a longer life-cycle by thinking about the uses it might have afterwards and designing the different parts so that they can be dismantled, refurbished and recycled.

## **2. Modularity and versatility**

Products must be designed to be versatile and adaptable to changing external conditions. During the design stage, modularity and versatility of products must be kept into consideration in order to promote reuse and give it new life. Definitely, it should be considered as necessary to design objects easier to repair once they reach the end of their lifecycle. Household appliances are just the most visible example of products that are not designed to be disassembled easily. This is a major limitation for the proper disposal or reuse of the various materials.

## **3. Renewable energies**

Oil, coal and other fossil fuels have a disastrous environmental impact especially on air pollution and greenhouse emissions. These should be totally abandoned in favour of the adoption of renewable energy sources such as solar, wind, and hydro that not only would preserve the environment but also would create an added value in terms of job creation and business opportunities.

## **4. Adopt an ecosystem approach and material recovery**

The Circular Economy requires the adoption of a new approach, centred on the whole ecosystem and its components. We can take an example from nature, where nothing is wasted and every waste can be used to give life to a new organism. In the same way, recycled materials can produce an infinite amount of new products. The most common example are recycled plastic, recycled paper, second-hand objects, but also the food waste that can be recycled up to 100% of its components. In conclusion, we can say that the idea behind the circular economy is based on few cornerstones that revolutionise the entire production process as well as the people lifestyle with a positive impact on the environment and society.

Considering the climate crisis and the increasing pollution at the global level caused by the environmental impact of global flows of people, goods and information, circular economy can play a key role in terms environmental protection, economic development, innovation and research and social inclusion, helping to build a more equal society. For these reasons, many experts

focused their attention on those sectors that could foster the transition towards a circular model and most ready to embrace the change dictated by the principles of the circular economy<sup>62</sup>.

#### □ **Building and construction**

Every year the construction sector produces 4.3 billion of tonnes of waste materials representing 25-30% of all waste generated in the EU. Strategies and new business models are needed to transform the sector. Today in Europe, in the construction industry more and more products are made from recycled waste materials, also from other industrial sectors. Among the most widely used recycled materials are rubber, plastic, aggregates and wood, rock wool, used to make new products, such as insulation. Increasingly attention is also paid to the second life of construction site debris and rubble, aggregates used for the production of new products.

#### □ **Plastic packaging**

Opportunities offered by alternative models are available also for this sector. Second life of plastic can be obtained by mechanical or chemical recycling, and designed to be recycled: these are the possible options, coexisting in the most advanced solutions, for almost all new materials and applications dedicated to the packaging industry. Versatile, aesthetic, high-performance, polyethylene terephthalate is the packaging industry's most popular material and its recyclability is very well appreciated by the market.

#### □ **Mobility**

Mobility is one of the areas where the concept of the Circular Economy has developed most<sup>63</sup>. Last decades demonstrated that habits of citizens concerning their daily mobility have changed. Phenomenon as the so-called sharing mobility have been growing strongly, especially in large cities. The car, therefore, is no longer understood only as a privately owned means of transport, but also as a service that can be used flexibly and communally.

Reduce the use of private transportation would increase the offer of public transport and sharing mobility services, and above all would give a real and strong boost to cycling.

#### □ **Textiles and fashion**

In Europe, most used clothing and textiles are still disposed of in mixed municipal waste streams. Mandatory separation of textiles will be introduced in the in 2025, but in some countries such as Italy the obligation to collect textiles waste separately has been already introduced.

The EU strategy for sustainable and circular textiles adopted on 30 March 2022 helps the transition to a circular and climate-neutral economy by 2030, and it aimed at the same time, at creating a greener, more competitive textiles sector<sup>64</sup>. Textile products placed on the European

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<sup>62</sup> <https://www.macfound.org/>

<sup>63</sup> <https://economiecircolare.com/>

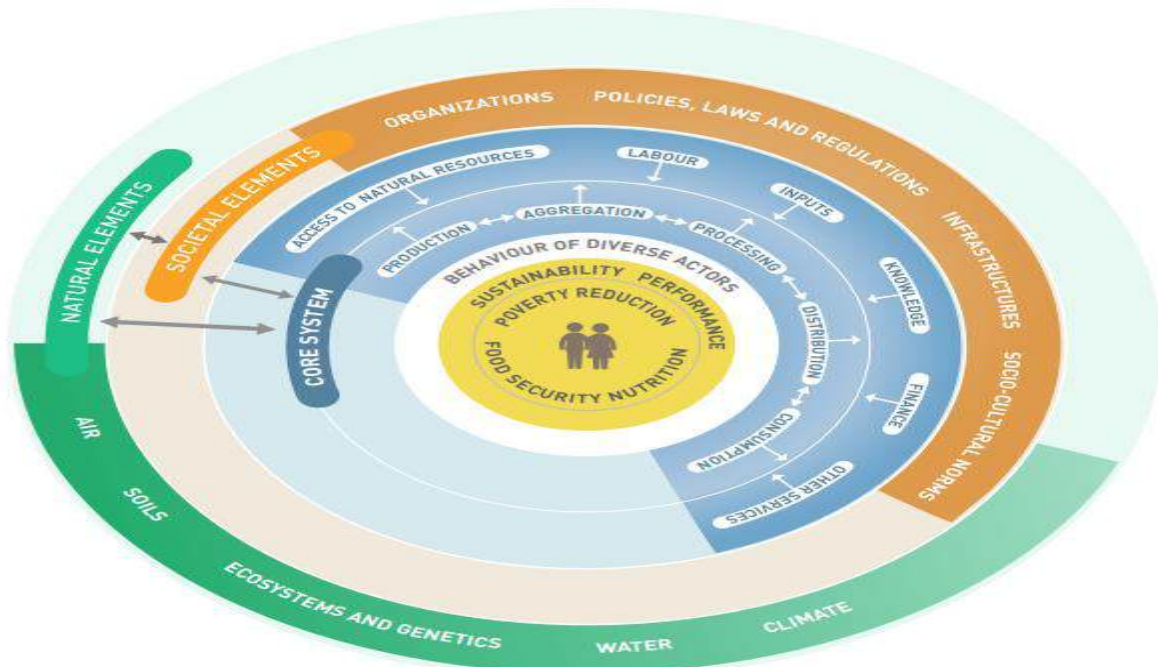
<sup>64</sup> <https://economiecircolare.com/>

market will have to be designed to be more durable, reusable, repairable and efficient, free of hazardous substances and produced with respect for human rights and the environment. According to the 'Textiles and the environment: the role of design in Europe's circular economy'<sup>65</sup> a report made by the European Environment Agency (EEA), in the EU the textile sector is the fourth most polluting right after the agri-food, building and construction and mobility sectors. Moving to a circular textile production system centred on reuse, recycling and the use of sustainable materials could greatly reduce the climate impact of the whole sector. Circular design of textile products to improve their durability, reparability and recyclability and ensure material utilisation is therefore crucial.

□ **Agriculture and food production**

Some of the EU goals in accordance with the UN 2030 Agenda, refer to the reduction of food waste by 30% by 2025 and 50% by 2030, the reduction of greenhouse emissions coming from intensive farming and other activities, and the recycling of at least 70% of packaging waste in the next 10 years. Recently it has been estimated that agriculture and food production are responsible of 35% of the greenhouse gases produced worldwide. With this regard, circularity models can be applied at all stages of the agri-food chain: from food growing and processing to packaging and waste management. Waste coming from food processing, harvest, pruning, cattle breeding and other activities can represent a unique resource for the production of biomaterials and green energy with numerous applications.

A circular economy approach to food waste would enable to recognize and maintain the value of



**Figure 14. 'Food system wheel framework'. The model is centred on FAO's main goals, which include poverty reduction, food security. Source: FAO.**

<sup>65</sup> Duhoux T., Le Blévenec K., Manshoven S., Grossi F., Arnold M., Mortensen L. *Textiles and the Environment The role of design in Europe's circular economy*; ETC-EEA, 2022.

food products, nutrients and resources for as long as possible, minimizing resource use and upcycling food waste and by-products. In this way, it would be possible to transform food by-products into more valuable materials. A better food waste management and circularity will help decisions makers and local governments to integrate food systems into local plans and actions, also by adopting an agroecology approach, with the final aim to foster interactions between actors in science, practice and social movements, by facilitating knowledge sharing and action.

Applying the concept of circularity to all the aspect of the production both for food and products has to be a must in all the Mediterranean countries. With this regard, it is important to share and foster those best practices already experimented and implemented in some of the European countries or regions, with the final aim to replicate and the most successful experiences all over the Mediterranean region. To do so, will be important to have multi-stakeholder approaches, as well as establishing synergies among international institutions, local governments, civil society, research centres, private sector, NGOs, investors, etc. This cannot happen without investments in innovation as well as education, information and knowledge sharing that enable to train, raise awareness and change the perspective/mind-set of local stakeholders<sup>66</sup>.

### Circular Economy sectors' needs, perspectives and threats

According to the questionnaires' results as well as previous analysis<sup>67</sup>, enterprises and SMEs operating in Circular Economy sectors and subsectors across the Mediterranean, show similar needs as those operating in the Green Economy. Specifically, if we focus our attention on the waste management and recycling sector considered as one of the most promising within the Circular Economy, several weaknesses and opportunities are described by those stakeholders that operates in this field.

In particular the analysis carried out in the seven project countries involving different types of socio economic actors show as business operators, SMEs and other kind of enterprises deal with several problems and difficulties, among the most common:

- Difficult access to finance and specific funds, both private and public;
- Lack of professional figures with specific skills and competencies able to work in the sector;
- Lack of investments in infrastructures, specifically affecting the southern Med countries but often also the northern shore countries such as Spain, Italy, Greece or Cyprus.
- Lack of support in logistics;
- Lack of tax benefits for those enterprises who willing to make their production processes more sustainable, also by adopting circular models.
- Tax reduction and charges;
- Lack of policies and specific regulations to support investments in innovation and new machinery.

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<sup>66</sup> <https://www.fao.org/3/cc1926en/cc1926en.pdf>

<sup>67</sup> *Food waste management and circular economy in Mediterranean cities*; SFS-MED WEBINAR, 2022.

- Debil waste management supply chains, often due to lack of resources and management of the suppliers (municipalities, private enterprises, etc.). Suppliers' efforts should be made to cut waste, use recycled materials and maximize the use of their resources.
- Excessive bureaucracy as well as different level of regulations and sources of law (local, regional, national and European) risk to hold back business, investments and ultimately growth.

Despite that, business operators who decide to turn their core business into sustainable circular models are aware about the opportunities offered by such macro sector. Entrepreneurs, who mainly focus their attention to technological innovation and sustainable production models, are perfectly aware about the economic opportunities offered by the Circular Economy models and also know that the only way to increase their business level and their income is to anticipate the market and occupy reference positions in activities such as:

- Dismantling of products;
- Recycling of materials;
- Treatment of organic waste;
- Energy production from waste;
- Eco-designed products production.

While it is true that SMEs have fewer resources to face the change to a more circular and sustainable models, it is also true that due to its smaller size they have the necessary agility to adapt their structures and processes in order to occupy part of these niches. Despite the fact that in this transition process SMEs will likely face various barriers, among which are those related to financing and the low degree of knowledge of the circular economy both among SMEs and their customers, they also have a growing number of drivers and tools that facilitate the change<sup>68</sup>.

Concerning the skills and competencies required by the labour market, SMEs operating in this field and social actors interviewed (TVETs, Association, Employment Agencies, public authorities, etc.) listed some of the most required soft and technical skills needed to work in the Circular Economy-related sectors and subsectors:

- Open-mindedness towards innovation
- Autonomy
- Dynamism
- Language skills
- Specific educational background
- Creativity and motivation
- Regenerative economy competences
- Digital vision
- Process automation vision
- Project management
- Marketing

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<sup>68</sup> [https://www.fundacionico.es/documents/137403/0/EC\\_pymes\\_Guia\\_Final\\_Partell.pdf/5421c3aa-c862-6dbe-ae2d-1fcfe3db0df9?t=1645449359835](https://www.fundacionico.es/documents/137403/0/EC_pymes_Guia_Final_Partell.pdf/5421c3aa-c862-6dbe-ae2d-1fcfe3db0df9?t=1645449359835)

Both for business operators and social actors, it is important to collaborate with education providers in real-time so that new training provision can be developed in parallel with innovations coming onto the market. The industry itself can also play a role in identifying the skills needed in emerging industries within the circular economy sector.<sup>69</sup> Definitely, to enhance links between companies operating in these sectors and TVETs institutions, will be an important step to undertake in order to guarantee high-skilled workforce which will protagonise the transition to the above mentioned Green Economy models, reducing the skill gap and matching the needs of SMEs and enterprises.

Furthermore, as recognised by several institutions and experts, it is essential that the European waste sector and its involved stakeholders will play a key role in the development of any future Circular Economy production model in each of the Mediterranean countries. Without investing in waste management and recycling (both domestic and industrial) the EU as well as each of the Med countries, will not be able to meet their ambitious objectives concerning environment protection, greenhouse emissions limitations and costs reduction. To this end, the integration of (often-costly) new technologies in the waste management cycles will be fundamental to achieve the ambitious 'zero waste' goal.

### Potential of the Circular Economy across the Mediterranean countries

The Covid-19 pandemic and its consequences, as well as the political, humanitarian and economic crisis caused by the war in Ukraine, made decision makers and the public opinion realise how breakable and dependent our economies are on the supply policies of other countries. This is why the circular economy and its practices such as recycling, in addition to the ecological value, are

*It is necessary to create a market and a culture that adequately valorises, with appropriate tools, materials and products from recycling, discouraging the use of virgin raw materials and rewarding an industrial sector often made up of small or medium-sized private activities, which have enabled and continue to enable the achievement of important results in the recovery of materials and energy from waste.*

Professor Paolo Barberi founder of Agroecology Europe

even more strategically important for the resilience of our economic and social system.

### Spain

With regard to general statistics in terms of the circular economy, Spain occupies intermediate positions in Europe. In Spain, around 137.8 million tonnes of waste are produced yearly (2018), but 48.3% of them ends up in landfills, while only 38.7% is recycled according to the 'National Institute of Statistics' (INE). Anyway, the Autonomous Community of Catalonia records a higher percentage than the Spanish average; in fact, the Catalan rate is nearly 46.6% in 2021, which is still

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<sup>69</sup> [https://assets.website-files.com/5d26d80e8836af2d12ed1269/608c0aa6fec4df0fa7bd78e4\\_20210422%20-%20CJ%20VET%20Paper%20%20-%20297x210mm.pdf](https://assets.website-files.com/5d26d80e8836af2d12ed1269/608c0aa6fec4df0fa7bd78e4_20210422%20-%20CJ%20VET%20Paper%20%20-%20297x210mm.pdf)

below the target set by the EU (50%), while the 34% of waste produces still goes to landfills. In any case, it is interesting to observe as within the region there are still substantial differences ranging from a minimum of 28.5% (Cerdanya) in some district, to a maximum recycling rate of 80.4% (Conca de Barberà) in others<sup>70</sup>.

According to the Spanish Circular Economy Strategy "Spain 2030" (EEEC), approved by Agreement of the Council of Ministers on 2 June 2020, in the construction sector there are possibilities to reduce waste, promoting reuse and recycling, which implies environmental and economic benefits. There will be more jobs on waste separation and sorting of used waste materials.

In the agricultural sector, as well as all the sectors belonging to the so-called bio economy, the challenge is to make it possible to produce better quality food at affordable prices, guaranteeing the sustainable use of natural resources, ecosystems and conservation of biodiversity, reduction of waste, recovery of waste whenever possible and the development of sustainable food models<sup>71</sup>.

The Spanish National Public Employment Service (SEPE), through its Occupational Observatory, has carried out a prospective study of the economic activities related to the circular economy in Spain and highlighted the need for the following profiles within the framework of future jobs created within this circular economy sector:

- Directors and managers of waste management companies;
- Industrial production, environmental research and development, agronomists, design, mechanical engineers, etc.
- Professionals with a university degree in occupational and environmental health and hygiene;
- Environmental protection professionals;
- Environmental education, as well as Chemists, Biologists and Geologists-Geophysicists<sup>72</sup>.

The EEEC lays the foundations to promote a new model of production and consumption in which the value of products, materials and resources remain in the economy for as long as possible.

The EEEC establishes five axes and three lines of action to be developed through the policies and instruments that affect the circular economy.

- Axis of action "Production": promote the design/redesign of processes and products to optimize the use of non-renewable natural resources in production, promoting the incorporation of secondary raw materials and recycled materials and minimizing the incorporation of harmful substances, in order to obtain products that are more easily recyclable and repairable, redirecting the economy towards more sustainable and efficient ways.
- Axis of action "Consumption": reduce the ecological footprint by modifying the guidelines towards a more responsible consumption.
- Axis of action "Waste Management": effectively apply the principle of hierarchy of waste, substantially favouring preparation for reuse and the recycling of waste.

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<sup>70</sup> [https://es.ara.cat/sociedad/medio-ambiente/catalunya-estanca-reciclaje\\_1\\_4443175.html](https://es.ara.cat/sociedad/medio-ambiente/catalunya-estanca-reciclaje_1_4443175.html)

<sup>71</sup> [https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/200714eeec\\_resumenejecutivo\\_en\\_tcm30-510578.pdf](https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/200714eeec_resumenejecutivo_en_tcm30-510578.pdf)

<sup>72</sup> <https://empresayempleo.ulpgc.es/oportunidades-de-empleo-en-la-economia-circular/>

- Axis of action "Secondary raw materials": guarantee the protection of the environment and health reducing the use of non-renewable natural resources and reincorporating them into the production cycle.
- Axis of action "Reuse and purification of water": promote efficient use of water resources.

Line of action "Research, innovation and competitiveness": promote the development and application of new knowledge and technologies to promote innovation and R&D.

Line of action "Participation and awareness": promote the involvement of economic and social agents in general and of citizens in particular, to raise awareness of current environmental challenges.

Line of action "Employment and training": promote the creation of new jobs in the circular economy sector, and the improvement of existing ones.

## Italy

In 2020, the last available year of data, in the EU European Union, the circular material utilisation rate was 12.8%. In Italy the value reached 21.6% in the same year, recording the second best performance among the 5 largest EU countries (France: 22.2%; Germany: 13.4%; Spain: 11.2%; Poland: 9.9%). Compared to all 27 EU countries Italy occupies the fourth position, only behind top rated countries such as the Netherlands (30.9%) and Belgium (23%) and France. Furthermore, Italy has experienced years of continuous growth in the rate of circular use of matter, starting from 11.6% in 2011 to 21.6% in 2020. It should be noted that in the last year of analysis in Italy the increase was 2.1%, compared to a European average increase of European average increase of 0.8%<sup>73</sup>.

Italy leads European countries with regard to waste recycling. In fact in 2021, the general recycling rate has risen up to 73%, increasing of 3 percentage points over the previous year. Considering the different categories of recycling materials Italy got very good percentages: paper (87%), glass (79%), plastic (49%), wood (62%), aluminium (69%), and steel (80%).

In Italy, the recycling rate of all waste has almost reached 68%: this is the highest figure in the European Union. Increased by 9 percentage points between 2010 and 2018 compared to a European average almost unchanged. Among the EU and Mediterranean economies, Italy records one of the highest share of special waste for recycling around 75% (2018). For municipal waste (10% of the total waste generated in the EU) in 2020, 47.8% of municipal waste was recycled in the EU27 and 54.4% in Italy, while the 20.1% of waste still goes to landfill (in countries such as Sweden, Germany, Denmark, Finland the landfill waste are less than 1%)<sup>74</sup>.

However, the territorial differences between the various regions of Italy are still significant, and especially in the south of the country, there are shortcomings in terms of waste recycling. Among

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<sup>73</sup> The circular material utilisation rate is defined as the ratio between the circular use of material and the total use (i.e. use from virgin raw materials and recycled materials). Ronchi E., Leoni S., Vigni F., Pettinao E., Galli L., Erme A. 4° *rapporto sull'economia circolare in Italia (sintesi)*. Circular Economy Network, 2022.

<sup>74</sup> *Ibid.*

these regions, Sicily has a percentage of recycled waste below the national average of 48,74%, despite the fact that considerable progress has been made in the last ten years. It is interesting to highlight that in several municipalities this percentage overcome the 90% of the total waste<sup>75</sup>.

Due to its geographical position and natural resources, Sicily has a great potential in terms of business opportunities and job creation with regard to the Circular Economy. Funds provided by the 'National resilience and Recovery Plan' who allocate around the 40% of total resources to the southern Italian regions, can represent for Sicily an extraordinary opportunity to invest in the circular economy practices and promote the creation of new business and SMEs, especially operating in recycling sector, as well as the use of green energy.

### Republic of Cyprus

Considering the main data and statistic about recycling the Republic of Cyprus is one of the 27 EU countries with the poorest recycling rate, with a percentage of 17%, very far from the target established by the European Union (50%) and the EU average 46.4%. The country currently ranks 25th out of the 27 EU member states for municipal waste recycling rate, followed only by Romania and Malta.

These criticisms are caused by several reasons, among them:

- Lack of incentives to manage waste according to the waste hierarchy;
- Insufficient (door-to-door) separate collection of waste;
- Extended producer responsibility (EPR) systems are not efficient and do not cover sufficient waste streams;
- No developments in infrastructure and collection systems to divert biodegradable waste from disposal;
- Lack of co-ordination between the different administrative levels;
- Lack of capacity at local level.

Through the Just Transition Plan (JTP) for Cyprus, the EU will invest a total of more than €1 billion in the country between 2021 and 2027. Within this budget, over €387 million from the European Regional and Development Fund (ERDF) will be dedicated to the green transition impacting and fostering investments in renewable energy, energy efficiency, and the reduction of greenhouse emissions in line with the European Green Deal. Investments in preservation of biodiversity, circular economy and sustainable practices, recycling and measures to fight the climate change will be done. Republic of Cyprus government will also devote €147 million to enhance the competitiveness of local SMEs and to foster the digital transition through innovation and research creating new business. The local government plans to create over 2485 new jobs at the country

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<sup>75</sup> <https://www.regione.sicilia.it/sites/default/files/2022-08/1%29%20Prospetto%20dei%20Comuni%20con%20dati%20percentuali%20della%20R.D.%20-%20Periodo%20GEN-DIC%202021%20-%20agg.to%20al%2011%20lug%202022.pdf>

level thanks to the JTP, including 885 in research and 133,000 new users of public digital services<sup>76</sup>. Moreover, the local institutions aim to support SMEs and Citizens with specific measures targeting the renewable energy sources financed by the Just Transition Fund (JTF) with a dedicated budget of €101 million, fostering in this way the energy transition process of the country. Dedicated technical schools will be set up in order to upskill and reskill young people with marketable skills in green technologies, filling the gap within the county's TVET system and reducing the mismatch between the labour supply and demand.

## France

The challenges for economic development and in particular for SMEs highlight the extent of the task to develop professions and develop new services. The study of job sources specific to the circular economy sector is still difficult to establish at the French level. Despite this, France Strategy has estimated that the workforce in the circular economy comprises nearly 800,000 full-time equivalent jobs (FTE), i.e. more than 3% of overall employment. More than half may be employed in eco-activities, the rest by repair, rental and the second-hand market.

The repair sector represents the largest number of jobs in the Circular Economy, with more than 200,000 FTEs, i.e. a quarter of the workforce. Finally, extending the life of goods involves reselling equipment that has already been used. The second-hand market sector is dominated by online trading and by professional dealers.

In order to boost such macro sector an anti-waste law for a circular economy was introduced by the French government on February 2020. It follows the work carried out during the roadmap for a Circular Economy, the result of a long process of consultation and exchange with stakeholders. The law features five main priorities:

- A comprehensive switch from the use of all disposable (single-use) items;
- better informed consumers;
- combatting waste and support for solidarity reuse;
- combatting planned obsolescence;
- produce better.

The law sets new targets, such as the end of disposable plastic by 2040. To achieve this, it introduces progressive bans to reduce single-use plastics. Several measures also aim to better inform consumers, such as the standardised refuse bin colours, the introduction of a single logo (Triman) to facilitate sorting or the expansion of environmental labelling. The law also prohibits the disposal of unsold non-food items and strengthens the fight against food waste. A reparability index has also been established to combat planned obsolescence particularly common in electrical and electronic equipments. Finally, a large part of the law is devoted overhauling those sectors subject to extended producer responsibility by creating new sectors, greater transparency and new targets or goals, etc.

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<sup>76</sup> [https://ec.europa.eu/commission/presscorner/detail/en/IP\\_22\\_4326](https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4326)

As part of the 2015 energy transition law for green growth, France has set itself ambitious targets to initiate the transition to a Circular Economy. Published on April 23, 2018, the circular economy roadmap proposes concrete measures to achieve these goals. The roadmap was the working basis of the anti-waste law for a circular economy.

The objectives of this roadmap are to:

- Reduce resource consumption linked to French consumption: Reduce resource consumption by 30% in relation to GDP by 2030 compared to 2010;
- Reduce the quantities of non-hazardous waste sent to landfill by 50% in 2025 compared to 2010.
- Strive for 100% recycled plastics by 2025;
- Reduce greenhouse gas emissions: save an additional 8 million tonnes of additional CO2 emissions each year by recycling plastic;
- Create 500,000 additional jobs, including in new occupations.
- The circular economy will also contribute to achieving some of the Sustainable Development Goals (SDGs) contained in the 2030 Agenda for France.

#### Jordan

In Jordan, the circular economy concept is new and not known yet for most institutions and individuals, so one of the needed requirements for Business Owners are the knowledge on circular economy and its effect for the efficient management of waste, energy, and water. Which leads for the need to resources management skills, waste management, and multiple use cycle.

As mentioned in “Waste Sector Green Growth National Action Plan 2021-2025”, private sector still needs the Government to provide financial and fiscal incentives structures, enforce the waste regulation, address evidence-based decision, and mobilize investment from larger companies and stimulate the growth of SMEs in waste management.

Considering the country’ characteristics, the potential in terms of investment, economic growth and job creation of the circular economy sectors is evident. For the development of good circular economy systems policy makers and other local actors are demanded to undertake the following actions:

- Reduce, recycle and reuse the waste before it arrives to landfill, in order to reduce the cost of resources and waste management, which will lead to the increase of the profit margin;
- To promote recycling among citizens by changing their mind-set explain the needs and benefit of the recycling;
- To promote the use of renewable resources for producing energy, thus boosting a green transition, mainly through the use of solar panel;
- Helping SMEs that invest in green technologies to access new markets or expand in existing ones;
- To boost or finance the innovation in technology and processes to leverage waste-to-resource and waste-to-energy;
- To promote the production of compost and organic fertilizers.

## Palestine

The circular economy sector and related subsector have a low rank in terms of business and generated value added (GVA) within the Palestinian economy, right after the blue economy. As the number of entities operating in this sector, whether as business operators or as social and economic actors are still too low.

The knowledge of individuals about the concept of circular economy is also limited, as shown in the NEETs and women profiling need assessment carried out within CLUSTER project, as well as skills and competences needed to operate within the sector are still not common among the local workforce. Generally, the general public show a lack of awareness about the circular economy opportunities and benefits and most likely they link it only to solar energy activities.

However, there is initiatives, and steps toward include either as a result of global shifting to adapting more sustainable practice mainly that a major part of Palestinian economy depends on the donor's community.

At the government level, the Environment Quality Authority (EQA) developed the Palestinian Sustainable Consumption and Production National Action Plan (SCP-NAP) under the EU-funded programme, with advisory services from the United Nations Environment Programme (UNEP). This plan is considered as a part of its efforts to achieve Sustainable Development Goals (SDGs).

## Tunisia

Since 1992, with the instauration of the ministry in charge with the environmental challenges, so many institutions and committees have been created (ANGED - National Agency for Waste Management, APAL - Agency for Coastal Protection).

The programme Agenda 21 is calling for all municipalities to adopt an environmental strategy with consultations of citizens and administrative authorities.

Industrial units upgrade programme, including management of by production and spoiled material, is not implemented yet because the industrial landfill programme is not active until now. Special legislation for energy-saving housing is not usually respected due to the consequences on higher prices of housing.

A large variety of activities within the Circular Economy may have the potential to be developed in Tunisia, among them:

- Recycling of many spoiled industrial machines
- Recycling of garbage households
- Recycling waste material residual of building activities
- Recycling of asphalt and sidewalk materials
- Recycling all by products of agriculture activities
- Glass, paper, cardboard, steel, plastic, coming from industrial and commercial activities.

## Impact of the Covid-19

Some of business operators interviewed at the project level operating within the Circular Economy reported that they suffered negative consequences as a result of the Covid-19 pandemic, since they registered a decline in their business operations and a reduction of their income.

At the same time other respondents stated that, the negative impact of the pandemic was moderate, compared to other economic fields. Several mentioned SMEs managed to successfully carry out the activities which were programmed (although at a virtual level) during the toughest period of the pandemic. However, some of those SMEs had to reorganize their teams (often firing employees or laying them off) and keep just the essential professionals. Many companies, admitted compared to the forecast for the beginning of 2020, there was a 20% reduction in their operations.

Some of the activities related to Circular Economy which mostly suffered an impact are:

- Activities related to collect all spoiled materials;
- Landfills and all projects related to waste collection and transfer system;
- Transport activities related to this industry;
- Recycling activities in units who in short of inputs of raw material.

The pandemic and Russian-Ukrainian war highlighted how euro-Mediterranean countries were not prepared to a such socio-economic shock, showing lack of capacity to contain and adapt to the systemic risks associated with a pandemic in a highly interconnected world based on rapid, borderless global flows of people, goods and information. Moreover, the pandemic and the war have highlighted the limits of our economic system based on the linear model, which extracts resources and creates waste to produce goods, creating environmental degradation, climate change, biodiversity loss and various other forms of pollution.

- The Ellen MacArthur Foundation believes that in order to emerge from the post-pandemic crisis, it is necessary to target investments in the five key sectors mentioned above, which are most ready to take up the challenge of the Circular Economy and able to meet both the short and long-term resilience and regeneration objectives of both the public and private sectors<sup>77</sup>.

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<sup>77</sup> <https://www.macfound.org/>

# SUSTAINABLE AGRICULTURE

## Sector overview

At present, the Mediterranean basin is undergoing significant changes not only in terms of politics or human and civil rights, but also in terms of climate. Sustainable development is a global goal that seeks not to compromise the ability of future generations to meet their own needs. According to the United Nations Millennium Declaration and its Development Goals, endorsed by 189 countries in 2000<sup>78</sup>, it is necessary to change production and consumption patterns that have become unsustainable. Furthermore, it is claimed the importance of protecting and managing natural resources more equitably, in order to safeguard health and ensure social and economic development that can combine the protection of the environment in which we live with the process of globalisation. Considering the threat of global warming and the depletion of potential resources, the main challenge now more than ever, is to find new opportunities and ways of production that can limit these phenomena. Knowledge of the decision-making process, the organisation of society, its regulations, political and economic processes, as well as human behaviour in relation to climate and energy change, are crucial for the development of renewable energy sources, essential to preserve the environment and maintain a high quality of life.

At the heart of the concept of Sustainable Agriculture, as defined by the 'Agricultural Sustainability Institute', is the goal of meeting the needs of the entire world population, without penalising future generations by damaging the environment. This objective can only be achieved if a balance is struck between the needs of an ever-growing world population and the exploitation of the natural resources offered by our planet. A sustainable agricultural production system must therefore be capable to optimise the use of available resources, respect the environment, contribute to the development of local communities, be competitive on the market and ultimately be able to maintain productivity levels indefinitely.

As stated by the Food and Agriculture Organisation (FAO) 'a sustainable food system is one that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generation is not compromised'<sup>79</sup>. This means that sustainable agriculture systems can be perfectly profitable, guarantying economic sustainability, as well as several benefits for the entire society with a positive or neutral impact on the natural resource exploitation, safeguarding the environment.

In particular in the Mediterranean region, food systems and their related chains have an important impact on the environment contributing to the greenhouse effect, land degradation and biodiversity loss, being affected and contributing at the same time, by global warming, extreme weather events and finally to the climate change. Facing these challenges, definitely requires an

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<sup>78</sup> See the declaration at:

[https://unstats.un.org/unsd/mdg/Resources/Static/Products/GAResolutions/55\\_2/a\\_res55\\_2e.pdf](https://unstats.un.org/unsd/mdg/Resources/Static/Products/GAResolutions/55_2/a_res55_2e.pdf)

<sup>79</sup> Sustainable food systems Concept and framework (FAO) <https://www.fao.org/3/ca2079en/CA2079EN.pdf>

integrated-based approach that addresses the range complexities of this phenomena in a sustainable manner.

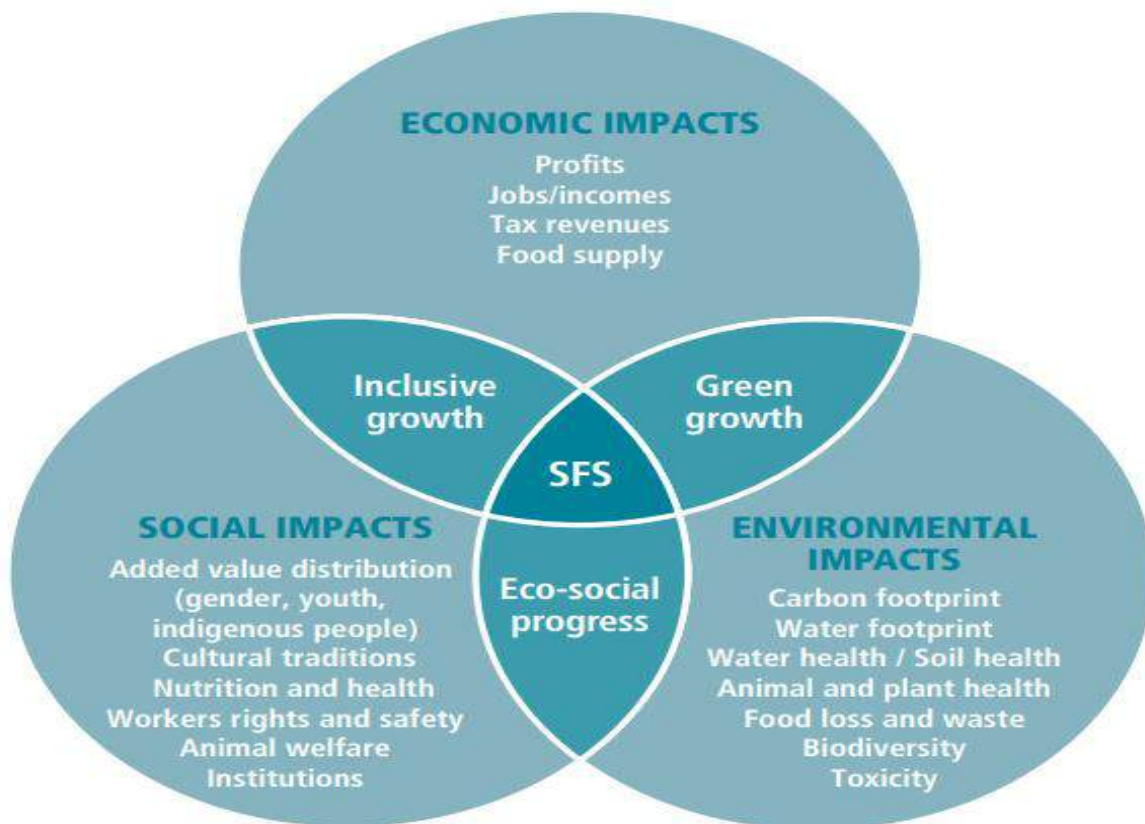


Figure 12: Sustainability in Food Systems

Considering the abovementioned challenges and the socio-economic context of the Mediterranean region, sustainability in agriculture must essentially consider six fundamental aspects:

- 1) The policy and management of the issue at the economic, cultural and social levels;
- 2) The energy used and production inputs, i.e. energy resources, fertilisers used, protection of crops from pathogen attacks, use of natural rather than chemical elements (organic farming), opportunities offered by research and technology;
- 3) The planning of resources (financial, material, etc.) needed to optimise production processes
- 4) Climate variability and its impact on agricultural production;
- 5) Soil characteristics and water availability, taking into account the specific needs of individual crops.

6) The issues related to the entire supply chain, i.e. the production, distribution and marketing chain of agricultural products, which although not necessarily affecting farmland, nevertheless have a significant environmental impact.

However, while these six points clearly identify areas in which lines of action can be developed to improve sustainability, the possible solutions are much more complex and articulated.

As established by FAO and others organisations, in order to turn into a more sustainable and effective production in agriculture and farming keeping in mind the need of a growing population particularly characterizing the south shore of the Mediterranean, is essential to achieve the following goals:

1. To increase productivity, employment and added value in food systems, through a change in agricultural practices and processes aimed at securing food supplies and reducing water and energy consumption.
2. To protect and improve natural resources: this includes preserving the environment, limiting pollution of water sources, combating the destruction of habitats and ecosystems, and soil deterioration.
3. To improve livelihoods, promoting inclusive economic growth.
4. To increase resilience, whether of people, communities or ecosystems. This implies the transformation of production models to ensure that the impact of extreme events due to climate change or market price variability is minimised as much as possible.
5. To face the challenge of adapting the governance of the sector to the new challenges, by means of a set of rules that makes it possible to balance the public and private sectors while ensuring transparency and fairness.
6. To ensure food security and supply both at the local and euro-Mediterranean level.

### Sustainable Agriculture sectors' needs, perspectives and threats

As we mentioned in the previous paragraphs, agri-food production systems are highly dependent by climatic changes, water resources and global warming. Despite these potential weaknesses, Sustainable Agriculture models are integrally considered as one of the major world players in the fight for long-term natural resource sustainability. Moreover, the agri-food and agriculture sectors are more and more characterised by the use of ICT technologies, which are nowadays considered as part of the value chain. Such developments drive these sectors to an innovation process which should take into account not only new sustainable production systems, but also a consistent readjustment of skills and job profiles.

In this sense, one of the main step to be undertaken is the identification of needed existing and emerging skills, especially in some of the categories linked with the agriculture and agri-food sectors, as bio economy, sustainability, and digital technology.

This assessment is needed to develop a concrete strategic approach able to keep the agri-food sector competitive, as well as make the agriculture especially in the Mediterranean Sea, more sustainable and inclusive in a long-term perspective.

A great input to a more sustainable, inclusive and profitable agricultural systems came from the modernisation of sectors thanks to the use of new technologies. It is exactly in this direction that the so-called Agriculture 4.0, which was born on the wave of innovations previously introduced in other production sectors, such as manufacturing and industry, is heading<sup>80</sup>. Thanks to the new technologies applied in the agriculture sector and the development of the Agriculture 4.0, it has been possible to implement new techniques, tools and technologies falling under the definition of 'precision farming' (or smart farming). This approach is considered as one of the most popular growing methods in agriculture, since it focuses on the use of technology to apply resources exactly when and where they are needed. Thanks to the use of data, satellite imagery, sensors, geolocalisation, drones, weather stations, Blockchain, internet of things, etc., is possible to monitor and analyse soil conditions and manage other resources such as water and fertilizer. This, in turn, allows the farmer to produce the greatest volume of crops at the lowest possible expense. In this way, it makes possible to use ad hoc cultivation and plant care methods according to the characteristics of the land and the areas in which they are located, optimising energy consumption, rationalising the use of water and fertilisers even according to real-time weather conditions. This ensures, on the one hand, the best care of crops, and on the other hand, the reduction of waste and consequently of environmental impact.

To this end, it is increasingly important to support farmers and agricultural entrepreneurs in this process of modernisation and technological upgrading. Support from institutional actors can be given both through direct and indirect funding to enterprises for the purchase of new technologies - as already done in part by some European funds such as the EAFRD (European Agricultural Fund for Rural Development) - but also through targeted policies that take into account the needs of the territories and the needs of entrepreneurs. In fact, despite farmers are considered the most important link in the chain, they often have difficulty in accessing private funding due to the high risks associated with the agricultural sector, among the most important: floods, drought, price fluctuations, insects, pests and unfair competition. Definitely, this transition must be accompanied to an update of skills and job profiles, with the final aim to guarantee an adequate number of high-specialised professionals working in strong cooperation with entrepreneurs and farmers, able to experiment, implement and apply such technologies on the field.

### Potential of the Sustainable Agriculture across the Mediterranean countries

As we have seen above, the Sustainable Agriculture can generate a great and positive potential in terms of Economic and Social growth as well as in reducing environmental impact. Cultural traditions, nutrition and health, workers' rights and animal safety, environment protection and preservation can coexist with enterprises profit and a major benefit in terms of income generated and increased added value. To achieve the goals of the 'sustainability' in agriculture, several models and techniques can be used by the stakeholders involved, adapting them to different

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<sup>80</sup> <https://www.esg360.it/environmental/agricoltura-sostenibile-cose-e-come-funziona/>

contexts within the Mediterranean area. Below are listed some of the most important models partially used or experimented in Mediterranean countries:

### **Organic farming**

This subsector, is probably the most known among the sustainable techniques used by farmers. Such production must follow specific rules and it is carried out in compliance with a severe European regulation (EEC 2092/91). In practice, only natural substances and natural fertilisers can be used, avoiding over-exploitation of natural resources and synthetic chemical substances.

### **Permaculture**

It is a model centred on agricultural practices geared towards the natural maintenance of soil fertility, but also an integrated design system that links together issues from different sectors as architecture, economics, ecology and legal systems for businesses and communities. In other words, it is about designing and managing man-made landscapes in a way that meets the needs of the local community, such as food and energy, without disrupting the sustainability of natural ecosystems. The design of environments according to permaculture principles is closely dependent on the characteristics of the area. Although the modes of intervention can be different, common guidelines applicable to all projects can be identified.

### **Ecovillages**

This model includes sustainability-oriented communities experimenting with new lifestyles, ranging from designing homes in a way that minimises environmental impact to food self-sufficiency.

**Solidarity-based agriculture**, characterised by the fact that products grow on land free from exploitation.

### **Spain**

The largest number of Spanish organic production (1,326) and import companies (122) is based in Catalonia. According to the mapping results, these SMEs expressed the following needs:

- Business support mechanisms and flexible economic incentives for the recruitment of NEETs
- Guarantee funds for the creation of sustainable enterprises
- More generally, access to finance

Due to their challenges in finding professional figures, in order to employ young people, SMEs would need individual or team training and/or education in:

- Innovation in processing techniques
- Technological innovation
- Soft skills
- Quality and product certification
- Management skills or courses for business managers.

The potential of Sustainable Agriculture in terms of job creation appears to be significant. The numbers of operators in the sector has steadily grown from 2000 to 2021 in Catalonia, and more

than by 11% only from 2020 to 2021<sup>81</sup>. This increment applies to all the professional figures involved (producers, manufacturers, importers and marketers), but more distinctly producers<sup>82</sup>. These figures are in line with the findings on the agricultural area dedicated to organic production in Catalonia, which grew in 2021 by 5.33% compared to the previous year, reaching 270.686 hectares<sup>83</sup>. As stated in 2019 by the Advisor of Climate Action, Food and Rural Agenda of Catalonia, Teresa Jordà, during the past 25 years, not only have certified organic agri-food products grown and diversified, but there has also been the awakening and growth of organic food consumption in the internal market of Catalonia<sup>84</sup>, which ultimately testifies the potential of business development in this sector.

## Italy

The Sustainable Agriculture in Italy has a strong and solid tradition and it is strongly influenced by the habits and usages of the Italian consumer. In particular, the organic farming represents nowadays an increasing market across the country.

Italy's organic surface area increased by 4.4%, reaching almost 2.2 million hectares by the end of 2021. The proportion of organic areas on the national total reached 17.4%, confirming the highest in the EU. At this rate of growth, 2.7 million hectares could be reached by 2027, the last year of the 2023-2027 CAP, and 3 million by 2030, close to the Farm to Fork target of 25% organic area.

Specifically, Sicily is by far the region with the highest number of hectares dedicated to organic crops with 370,000 ha and 11.128 farmers certified. The main organic crops in the island are fodder crops (61,580 ha) and cereal crops (50,826 ha). Also significant is the figure for citrus fruit (21,660 ha) and nuts (13,638 ha)<sup>85</sup>.

Nevertheless, the expansion of organic farming is strongly influenced by the policies carried out by the regions, within the measures of the 2014-2020 RDP (Rural Development Programme).

Among the various organic crops in Italy, permanent crops are growing the most (+3.5% overall), with diversified trends among the varieties. Hazelnut groves (+12.5%) and vineyards (+9.2%) are on the increase, organic apple orchards (-0.4%) and olive groves (+0.5%) remain stable, while citrus groves are down (oranges -17.2%, lemons -0.8%).

The areas dedicated to organic cereals finally grew (+2.8%), thanks mainly to the drive of greater investments in durum and soft wheat, fodder crops (-0.7%) and meadows and pastures (-0.8%)<sup>86</sup>.

Inflation seems to influence partially the consumption of biological food, since the loss of purchasing power inhibits consumer preferences and the return to the office after lockdowns forces them to eat out, where organic is a rare gem.

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<sup>81</sup> [http://www.ccpae.org/docs/estadistiques/2021/01\\_2021\\_inscrits.pdf](http://www.ccpae.org/docs/estadistiques/2021/01_2021_inscrits.pdf)

<sup>82</sup> [http://www.ccpae.org/docs/estadistiques/2021/02\\_2021\\_inscrits\\_activitat.pdf](http://www.ccpae.org/docs/estadistiques/2021/02_2021_inscrits_activitat.pdf)

<sup>83</sup> [http://www.ccpae.org/docs/estadistiques/2021/03\\_2021\\_superficie.pdf](http://www.ccpae.org/docs/estadistiques/2021/03_2021_superficie.pdf)

<sup>84</sup> <https://www.lavanguardia.com/natural/20190404/461457152686/agricultura-produccion-ecologica-catalunya-evolucion-ccpae.html>

<sup>85</sup> Data provided by Coldiretti Sicilia (<https://sicilia.coldiretti.it/>).

<sup>86</sup> <https://www.ilsole24ore.com/art/biologico-sicilia-perde-terreno-un-anno-oltre-17percento-ettari-meno-AEPuovkB>

## Republic of Cyprus

Cyprus ranks in the lowest positions among EU countries in relation to sustainable agriculture. It is severely affected by climate change, putting at risk both the safety and adequacy of domestically produced food and livestock production. Rising temperatures, declining rainfall and extreme weather events are the main threats faced by farming today. In addition, the lack of irrigation water and new diseases exert destructive pressures on agricultural development, while intensive cultivation results in the substantial degradation of agricultural land, posing a threat on biodiversity. In general, Cyprus' agriculture sector is characterised by low productivity, increased fragmentation, an aging population of farmers, and a limited use of technology.

Agriculture workers are involved with a wide range of activities and have to perform a lot of tasks. They are employed by farms, ranches, and nursery houses. Agricultural workers plant, cultivate and harvest crops, raise livestock and poultry and also maintain and monitor the health and welfare of animals and providing feed and water. They are also operators of farm machinery.

Among the technical skills required, workers must be able to competently operate complex farm machinery. They also occasionally do routine maintenance on the machinery. Based on research on young Cypriot farmers, the requirements to bridge the knowledge gap and challenge the ageing farming population include the development of marketing skills, management skills, specific technological knowledge and networking skills, which are helpful in creating partnerships and setting up producers' groups.

Adoption of sustainable production by emphasizing on developing a competitive agriculture sector primarily through agri-tech and strong collaboration with business, higher-education institutions, and research centres. The National Strategy for the Development of Mountain Communities was adopted by the Council of Ministers in October 2019. The strategy aims to revitalise the region of the Troodos Mountains and will breathe new life into the mountain communities, create jobs, promote tourism and support agriculture and cottage industries. The strategy envisions 250 actions to be taken until the year 2030 for boosting the quality of life and promoting sustainable development in mountain communities.

## France

The development of sustainable agricultural models is a fundamental trend in the development of agriculture in France and in Europe. Even if conventional models remain mainstream, the growth of "alternative" models is accelerating, with new momentum during the COVID 19 pandemic (see below). In 2019, there were 47,196 certified organic farms (13% increase compared to 2018). This figure equates to 10% of French farms, 2.3 million hectares (organically farmed areas have doubled in 5 years), and 70,322 operators engaged in organic farming (14% increase compared to 2018). If we extrapolate these trends to all the models of sustainable agriculture for the coming years, there is significant potential for the growth of farming and employment in the sector, both in terms of reorganising existing skills, in addition to new jobs and trades. To date, despite recent uncertainties linked to the war in Ukraine and international tensions over the prices of agricultural raw materials, the priorities of French and European policies related to agriculture focus on the

ecological transition process and support for more sustainable agricultural models. The orientations of the new common agricultural policy, currently in the process of being approved, propose a major reorientation of loans to support sustainable farming models: reinforcement of the eco-conditionality of agricultural aid, obligation made to States to direct at least 35% of European agricultural development funds towards activities that improve the environment, etc.

In this context, France has stepped up its support for sustainable agricultural models between 2023 and 2027, with the following guidelines:

- the target of doubling organically farmed surface areas by 2027, i.e. 18% of the agricultural land,
- incentives, in particular for the maintenance and planting of hedges and agro-ecological elements to increase biodiversity and carbon storage, etc.
- support for crop diversification (increasing natural biodiversity, strengthening agroecosystem capacity to respond to extreme climatic events and uncertainties and also providing producers with additional means of generating income);
- Preservation of permanent grasslands
- Soil preservation (erosion, water purification), and maintenance of landscapes)

#### Jordan

Many economic challenges faced by Jordan today are caused by the Covid-19 pandemic, political conflict in neighbouring countries, and the added environmental hardships, such as Energy, water, desertification, waste management, and the loss of biodiversity. The Covid-19 pandemic and the associated response measures are having a major impact on Jordanian enterprises reducing demand and supply and causing a disruption to value chains. Furthermore, the vast majority of enterprises had a major decline in revenues, difficulties paying wages and continuing operations.

The key impacts of Covid-19 on adaptation related sectors could be listed as follows:

- Increasing the supply-demand gap on water in particular the domestic water.
- Increasing the volume wastewater and pressure on wastewater treatment and disinfection.
- Increasing costs of water pumping and maintenance of water utilities.
- Disruption of normal agricultural production and supply chains and increased demand on locally cultivated food products.
- Employment losses rate was increases, mainly driven by job losses in services, followed by agriculture.

The market analysis Questionnaire conducted on Business Owners showed a general need for qualified staff in the following majors:

- Irrigation Technician
- Fertilization Technician
- Aquaponics and Hydroponics experts.
- Process innovation
- Resource efficiency
- Quality assurance
- Management

As well, the data collected and the national report are indicating that the SMEs needs in this sector are mainly:

- Access to Finance
- Professional well-trained staff
- Logistics services
- Decrease post-harvest losses
- Efficient market
- Quality assurance
- Food safety standards

SMEs still needs the Government to provide financial and fiscal incentives structures, address evidence-based decision, and mobilize investment from larger companies and stimulate the growth of SMEs. On the other hand, SMEs needs to have a flexible crop planning and variety selection methodology and decision-making process based on crop-per-drop and economic competitiveness.

Potential of the sustainable agricultural system in Jordan:

- Agriculture sector bio-waste to resources
- Return lost export markets
- Increase investment in future-oriented techniques, technologies and business models that will contribute to sectoral growth
- Mainstreaming landscape restoration, forestry and resource efficiency measures into agriculture sector activities.
- Increase opportunities for farmers and rural communities to improve their skills
- Access to finance to promote sustainable livelihoods and decent, green jobs in the sector
- Use of existing resources by reducing physical and commercial losses and improving energy efficiency in water treatment and distribution which lead for a more profitable business
- Manufacture their own resources by re-processed and re-used solid waste
- Organic farming and exporting

### [Palestine](#)

The agricultural sector in Palestinian socioeconomic context has a special importance, not only because its contribution to GDP by 7% as per the investment promotion and industrial estates agency statements, also due to its contribution to the issue of food security. Therefore, the possibilities and opportunities for the development in sustainable agriculture are very large, especially that utilize the local resources is one of its pillar, and thus its developing could be less effected by the complexities associated with the political situation, such as import restrictions.

In addition to the fact that the possibilities of development are largely linked to the presence of local expertise. Where at the local level, we can find experts, the successful experiences, even, educational institutions that teach sustainable agriculture, more than the other sectors targeted in the CLUSTER which could speed up its development. The operators who are working in this sector from whom filled the questionnaire think that the sector's business opportunities will increase in the future.

Among the four sectors targeted in CLUSTER Project, the Sustainable Agriculture sector is the most 2nd sector present in Palestine, where the number of businesses operates in this field constituted 28% of the respondents. In addition, we found that about 43 % of the active institutions; social actors; public and NGOs implement activities related to sustainable agriculture. On the level NEETs and women, we also noticed that the concept of the sustainable agriculture is a the most familiar one since 70% of the NEETs and Women know this concept.

At the policy maker level, there are tendencies from the Palestinian government to focus on sustainable agriculture, such as the National food and security policy 2019-2030 and national investment plan for food and nutrition and sustainable agriculture 2020-2020. Catalysing these polices are contributing to develop the existence of the sustainable agriculture sector in the future<sup>87</sup>.

## Tunisia

Sustainable agriculture is a high challenge, considering the more and more intensive effect of climate changes. The coastal regions, so crowded due to the fact that it's a region of intense economic activity. People come to live in and it is attractive also for touristic activities.

But theses regions, and the governorate of Nabeul is highly affected in this sense, are seeing their local potential resources are over exploited. More over groundwater is subject to seawater infiltration pressure. This phenomenon is common to all coastal regions around the Mediterranean.

The impact of Covid pandemic is affecting all economic sector and has increased the unemployment figures. But sustainable agriculture is affected more over by climate changes than pandemic. In this sense, the over exploitation of water resources has started decades before; the usage of intensive chemical fertilizers and pesticides, and seeds sensitive to local climate, all these factors affected sustainable agriculture from decades and is continuing despite the efforts made to reduce these effects. The most policy decisions for sustainable agriculture are:

- A Gene bank for local seeds is created but for commercial and economic reasons, coming back in sue of these seeds is actually not benefit.
- Mapping of agriculture activities according to specific local conditions, but the implementation of this decision is so limited, if it is not respected.
- Decade strategies from 1990s to mobilize rainfall and build more dams where conditions allow. Actually more than 85% of rainfall is collected in dams, and an integrated system of management of these resources is in use by the connection of dams in the North of the country. The region of Nabeul, known for diversity of its agriculture activities is suffering from shortage of local water resources balance, canal from dams in the North.
- Strategies for soil conservation concerning the most affected lands, especially in the North, in order to protect dams from silting.

Financial incentives and subsidies to economy of irrigation technics.

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<sup>87</sup> [https://www.moa.pna.ps/strategies#collapseTo\\_204](https://www.moa.pna.ps/strategies#collapseTo_204)

## Impact of the Covid-19

The crisis and the consequences resulting from the Pandemic, as well as, the effects caused by the war in Ukraine from February 2022, have brought to light the numerous shortcomings and criticalities in the supply and production chains of numerous internationally traded products and commodities, including above all food and agricultural products. The most obvious consequence was, and still is, the malfunctioning of long global supply chains. In fact, it has become evident that relying only on long supply chains, which often cross several continents, is neither a prudent nor a sustainable solution as it entails many risks, as well as has a highly negative impact on the environment. This model of agricultural and production systems strictly based on the principles of globalisation, also shown its weakness with regard to the workforce. Indeed, in recent decades, the agricultural sector, especially in the countries on the northern shore of the Mediterranean, has been based on the exploitation of seasonal and underpaid workers, mostly formed by migrant, often employed illegally.

Due to the pandemic in 2020 and 2021, many of these seasonal migrants were no longer able to cross the national borders due to the closures and restrictions imposed by many European and non-European governments, leading to a shortage of workers in the fields that caused several problems to farmers. This situation was considered as a threat by farmers and entrepreneurs, already squeezed by the low prices imposed by large retailers and multinationals.

The closure of local markets in many cities, mainly due to compliance with social distancing regulations, caused many hardships to many small farmers who have been obligated to set up a home delivery system, close down their business or abandon their crops.

In addition to this, the reduction in terms of businesses and income in many key sectors of the Mediterranean countries' economies, such as tourism, hotel industry or food and beverage, has left many people without jobs, increasing poverty levels and causing strong price increase of fruit and vegetables due to supply difficulties, especially in large cities.

Possible solutions to these unusual situation, include relocating food systems from the cities, enhancing the role of short supply chains and local food networks. These solutions would lead to a decrease in system vulnerability and food insecurity. Indeed, as we experience the crisis in agriculture and employment, as well as the increase in absolute and relative poverty levels caused by the pandemic and the aftermath of the Russian-Ukrainian war, many innovative approaches related to short supply chains are emerging in many areas and countries, demonstrating strong resilience and effectiveness.

In many cases, these solutions adopted by local stakeholders can be considered good practices with a high level of replicability, although they may sometimes depend on cultural background, available resources, size of cities, and policies adopted at local and national level. Moreover, it is fair to say that these practices can certainly contribute to the transformation of the food systems in terms of greater environmental and economic sustainability, but also greater social equity.

These practices reveal the extent to which values such as territoriality, proximity and relationships of trust between producer and consumer make a food system less vulnerable to external shocks. Ultimately, focusing on policies promoting short supply chains and diversifying agricultural production would not only guarantee healthier and safer food, but would also ensure higher quality jobs in agriculture, higher wages for agricultural workers, as well as reduce the environmental footprint, thus, indirectly contributing to the improvement and healthier and fairer development of local communities.

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