

**Report on**  
*Agriculture and food security*  
*in the context of climate change in the Mediterranean*

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## **Introduction**

Agriculture (the art of growing food) and diet (the art of eating it) have traditionally been cornerstones of Mediterranean cultural identity. This report puts forward tangible solutions for ensuring resilient food security<sup>1</sup> and food sovereignty<sup>2</sup> for the 22 neighbouring countries and 550 million inhabitants of the Mediterranean region in 2021 and in the future, given that climate change will exacerbate an already very vulnerable situation.

### **I. Mediterranean agriculture faced with the manifold challenges of climate change**

#### **1) A lack of long-term governance and common vision**

- Agricultural management policies are not at the top of the political agenda for all Mediterranean states and local and regional authorities (LRAs)<sup>3</sup>.
- The stakeholders do not attach sufficient importance to sustainable and coordinated management of resources (water, soil), and many authorities involved (ministries, LRAs, agricultural and/or water authorities, regional agencies) act at various stages of the management chain in accordance with a range of different rules and provisions.
- Decision-makers often fail to take account of the long-term economic and environmental impact of agriculture as short-term profitability takes precedence.
- The agricultural sector is generally seen as unattractive due to a negative social perception of living and working conditions, and so ageing farmers and the lack of generational renewal are endangering food security in the region.

#### **2) Fragile farming soil**

- Erosion, salinisation and acidification are harming soil in the Mediterranean region, with previously fertile soil now falling prey to desertification. These problems are being exacerbated by climate change.

#### **3) Water management which is unable to cope with droughts and shortages**

- The Mediterranean region already comprises 50% of the people around the world affected by lack of water, and water shortages will only increase with climate change.
- Management of water supplies focuses almost entirely on the use of underground rather than surface water. This applies particularly to Southern and Eastern Mediterranean countries (SEM countries), as 85% of the Mediterranean's water resources are located on the north shore (including Turkey).

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<sup>1</sup> **Food security:** ensuring that everyone has financial and geographical access to sufficient amounts of healthy food produced using sustainable methods.

<sup>2</sup> **Food sovereignty:** refers to the right of people to define their own agricultural and food policies, to protect and control domestic agricultural production and trade, to determine their margin of independence, to limit the dumping of low-priced imported products on their markets and thus focus on local production and consumption.

<sup>3</sup> This varies from one country to another: for example, in 2020, the **Green Generation 2020-2030** scheme was implemented in Morocco, a new national agricultural strategy building on the trend towards sustainable agriculture promoted by the previous **Green Morocco Plan** (2008-2020). In Algeria, key instruments include the **national development and rural renewal plan** (PNDR 2000-2010), the **agricultural and rural renewal policy** (PRAR 2010-2014) and the **FELAHA 2014-2020 plan**.

- Demand for water is increasing steadily while availability is decreasing, and loss and waste are considerable.

#### **4) Overexploitation and wastage of food resources, coupled with significant dependence on imports**

- Food loss and waste take place at every level, from the post-harvest stage to retail<sup>4</sup>. The region wastes up to 30% of its natural resources, despite already struggling with inadequate water resources (around 20% in the EU<sup>5</sup>).
- Dependence on imports of basic foodstuffs (particularly cereals) affects the price of food products and makes countries dependent on the price of raw materials and on fluctuations of foreign exchange: in some SEM countries, people spend up to a third of their available income (compared to the EU average of 12.1%<sup>6</sup>).
- Fishing stocks are overexploited while small-scale/coastal fishing predominates.
- Significant sea, water and air pollution is still a problem in many neighbouring countries.

#### **5) Very vulnerable types of farming in the Mediterranean region**

- The outlook for the next few decades<sup>7</sup> is far from rosy: the Mediterranean region is heating up 20% more rapidly than the global average and extreme climate events (heat waves, drought, fires, flooding) will get worse.
- Small and medium-sized farms are most exposed to climate disruption, and most farms in the Mediterranean region are small family businesses which provide 80% of crops and livestock and occupy 75 to 85% of agricultural land<sup>8</sup>.
- Single crop farming is the most common type of agriculture in SEM countries; cereals account for around 60% of harvested land but only 15% of the commercial value of unprocessed agricultural production<sup>9</sup>.
- There is inadequate productivity, competitiveness and added value in the Mediterranean agri-food and agri-industrial sectors due to a lack of structural investment in post-harvest stages and infrastructure.

#### **6) Food: a major public health issue**

- The development of industrial food based on imported processed products has pulled people away from the traditional Mediterranean diet, causing or worsening major public health problems: obesity, cholesterol, diabetes, cancer, etc.

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<sup>4</sup> <http://www.fao.org/food-loss-and-food-waste/en/>

<sup>5</sup> **Circular economy plan 2.0** (2020).

<sup>6</sup> <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20191209-1>

<sup>7</sup> **Scientific report on the impact of climate change by the IPCC/MedECC** (2019).

<sup>8</sup> Marzin et al. 2017.

<sup>9</sup> OECD-FAO, 2018.

## II. Recommendations for a Mediterranean agricultural model able to cope with climate change

### A. Promote the Mediterranean diet

- 1) Promote the historical, cultural, gastronomic and food heritage of the "*Mediterranean diet*", which in 2010 was classified by UNESCO as part of the intangible cultural heritage of humanity as "*a set of skills, knowledge, practices and traditions*" which are the cornerstones of a strong common cultural identity across the Mediterranean region. This balanced diet is based on short supply circuits throughout the year, which support significant genetic variation and varieties which are suited to the local area and the Mediterranean climate. Rich in micronutrients and antioxidants (vegetables, fruit, fish, olive oil, herbs)<sup>10</sup>, it is healthier (preventing chronic diseases) and more resource efficient than the North American or western-style diet. This diet is fully in line with the principles of the *One Health* movement<sup>11</sup>.
- 2) Encourage traditional Mediterranean agriculture as a major source of knowledge and expertise: it is technical, innovative, resilient and advanced in terms of agro-ecology, particularly on the north shore of the Mediterranean.
- 3) Bring back age-old and resilient Mediterranean crops which have been abandoned (almonds, pistachios, durum wheat, etc.). Develop local flours, local seed registers and banks so that local farmers are not forced to buy registered seeds from foreign companies.

### B. Begin the agro-ecological transition to preserve soil and agro-biodiversity

- 1) Promote sustainable agricultural practices (precision, organic and conservation agriculture, agroecology, etc.) to protect productive natural resources<sup>12</sup>.
- 2) Emphasise resilient, effective and managed agricultural ecosystems to maximise synergies between agriculture and biodiversity<sup>13</sup>.
- 3) Divide Mediterranean agronomy into systems suited to their specific environment.
- 4) Use initial and lifelong training to promote, diversify, restructure and enhance the added value of resilient and diversified farming activities in each farm: not only food products, but bio-economy, production of renewable energies, agritourism, etc.

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<sup>10</sup> See the publications by the panel of international experts [Foundation of Mediterranean Diet \(IFMeD\)](#) regarding this diet.

<sup>11</sup> The **One Health** initiative was set up at the start of the first decade of 2000 to promote an integrated, systemic and unified approach to public, animal and environmental health at local, national and global level.

<sup>12</sup> **Productive natural resources**: soil, water, agro-biodiversity.

<sup>13</sup> **Two models**, [AFTERRES/Solagro](#) and **TYFA/IDDRI**, have been implemented to assess changes in agriculture which would make it possible to meet climate targets by making conservation agriculture standard practice: *IDDRI, Une Europe agroécologique en 2050: une agriculture multifonctionnelle pour une alimentation saine (An agro-ecological Europe by 2050: multifunctional agriculture for healthy food)*, 2018.

- 5) Opt for more resilient species of crops: go back to species (such as durum wheat<sup>14</sup>) which have always been part of the Mediterranean diet and which are less demanding and more nutritious in order to husband resources. Anticipate climate change by growing cereals adapted to desert regions (such as millet and sorghum).

### **C. Preserve water resources and manage them more efficiently**

- 1) Make irrigation systems for farming more efficient so as to reduce waste (precision agriculture, *keyline design*, etc.).
- 2) Redesign the governance, economic model and pricing modalities of water in order to finance vast investments in water infrastructure: collective management and pooling of costs, uses and users
- 3) Bring water treatment plants closer to the places where drinking water is used: untreated water which is not fit for drinking could be carried across the entire region, resulting in significant savings by doing away with the need to build a second network for drinking water.
- 4) Develop circular economy principles and capitalise on unconventional water resources such as desalination of sea water and reusing waste water for farming.
- 5) Give priority to finding out more about water reserves in order to coordinate water management, particularly in the southern Mediterranean region where fossil water is not renewable.
- 6) Focus efforts on innovation: AI, IoT, etc., based on space technologies (*Copernicus, Galileo*).

### **D. Support food security and sovereignty**

- 1) Combat food loss and waste in line with the *Milan Urban Food Policy Pact* (2015).
- 2) Step up food storage policies.
- 3) Introduce new measures for the preservation of coastal areas and fisheries management.
- 4) Make farmers less vulnerable by providing more support for climate change mitigation and adaptation measures as from their settlement.
- 5) Invest in developing urban and suburban food agriculture which is as close as possible to consumers, using interactive and multi-stakeholder techniques.
- 6) Set up regional databases of all local producers to promote short distribution chains.

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<sup>14</sup> **Durum wheat/soft wheat:** durum wheat is a variety of wheat known for its hard and vitreous grain which is rich in protein, including gluten. Bread made with this type of wheat does not rise well, but durum wheat is excellent for making pasta, couscous, semolina and bulgur. Soft wheat or bread wheat is currently the most widely cultivated species of wheat in the world in terms of both surface area used and volume produced and is perfect for making bread and flour.

- 7) Promote *Globally Important Agricultural Heritage Systems (GIAHS)*<sup>15</sup>; for instance, Siwa Oasis<sup>16</sup> in Egypt was awarded this certificate in 2016.
- 8) Ensure that insects and plant-based proteins (such as pulses, oilseeds and aquatic plants) play a bigger role in protein sovereignty, as regards both humans and livestock.
- 9) Establish assisted migration policies for plants and seeds so as to anticipate the northwards drift of climate characteristics. Local seed banks will have to be set up alongside this.
- 10) Develop strategic partnerships for food security through Mediterranean trade and cooperation agreements, which would reinforce regional integration.
- 11) Target, analyse and if necessary revise certain clauses in economic partnership agreements (EPA)<sup>17</sup>: many of the crops grown in SEM countries are exported directly to the EU which in return exports certain low-cost subsidised products which limit the development of local production chains.
- 12) Implement mechanisms to ensure fair prices for producers and implement regulation to avoid abuses in the food distribution chain.

### **III. Bolster Euro-Mediterranean cooperation for sustainable and resilient agriculture and guarantee food security in the context of climate change: operational proposals**

LRAs are on the frontline when it comes to establishing Euro-Mediterranean cooperation:

- 1) **Organise a meeting of Union for the Mediterranean (UfM) with agriculture, environment and health ministers** focusing on food security and adapting Mediterranean farming systems to changing climate conditions. A project forum for international donors and creditors, enterprises, LRAs and agricultural and agri-food stakeholders should be established and linked to these meetings.
- 2) **Promote a Summit of the Two Shores on these issues**: following on from the first summit organised by France in Marseilles in 2019, a summit bringing together delegations from the 5+5 Dialogue<sup>18</sup> countries, states, LRAs and civil society stakeholders could submit proposals for projects and multi-stakeholder partnerships.
- 3) **Draw up a Charter for Euro-Mediterranean food sovereignty with a common policy declaration and targets for signatory countries and LRAs**: this would enable the UfM,

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<sup>15</sup> **GIAHS**: the agricultural equivalent of UNESCO world heritage sites, this is a certification which recognises outstanding landscapes of aesthetic beauty that combine agricultural biodiversity, resilient ecosystems and a valuable cultural heritage. Located in specific sites around the world, they sustainably provide multiple goods and services, food and livelihood security for millions of small-scale farmers: <http://www.fao.org/giahs/en/>.

<sup>16</sup> <http://www.fao.org/giahs/news/newsletter-detail/en/c/852829/>.

<sup>17</sup> Trade agreements seeking to develop free trade between the EU and ACP (Africa, Caribbean and Pacific) countries.

<sup>18</sup> **5+5 Dialogue**: France, Italy, Spain, Portugal, Malta, Mauritania, Morocco, Algeria, Tunisia, Libya.

states and LRAs to adopt a long-term integrated approach to coordinated management of agricultural natural resources (water, soil, agro-biodiversity) and Mediterranean food sovereignty.

- 4) **Lay the political groundwork for the creation of a common *Euro-Mediterranean Response to food system crises with an Emergency Plan and an Agricultural Solidarity Fund*** to help countries hit by natural disasters (drought, destructive insects, fires, etc.), along the lines of the European common agricultural policy's reserve for crises in the agricultural sector.
- 5) **Set up a Euro-Mediterranean observatory for agricultural markets, resilient agri-environmental practices<sup>19</sup> and sustainable food systems<sup>20</sup>**: this could collect and share policies and local and regional good practices with regard to sustainable agriculture, food security, preservation of cultural food heritage, inequalities in the food system, etc.
- 6) **Boost human capital in a collective dimension by developing initial/lifelong training programmes, interactive research workshops and technical advisory bureaux for agri-industrial businesses – big, small and medium-sized companies -, professional agricultural organisations/cooperatives** on climate disruption, agro-ecology, water/soil management, circular economy, food waste, urban agriculture, etc. Focus on reinforcing the capacity, skills and expertise of farmers, women and young people who are key civil society actors on agricultural issues within traditional markets in the SEM countries and decisive for inclusive governance.
- 7) **Develop a "*Mediterranean products*" or "*Mediterranean diet*" label with a specific set of criteria and a broad communication plan**: guaranteeing that the Mediterranean products are nutritious and healthy, drawing on the SIQO model<sup>21</sup> (AB, PGI, PDO<sup>22</sup>) and linked to the promotional development of the Mediterranean diet<sup>23</sup> at international level and for export purposes and in major international food shows (such as SIAL, the *Salon international de l'alimentation*, or international food show). Festivals or Mediterranean gastronomy weeks promoting labelled products could be organised on a yearly basis, moving from one host city and/or country to another each year.

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<sup>19</sup> The European project [LIFE AgriAdapt](#) sets out a range of resources, tools and methods to sustainably adapt farms to European climate risks, and includes the digital platform "AWA" focusing on the Mediterranean region: <https://awa.agriadapt.eu/en/>.

<sup>20</sup> In 2020, the FAO set up a public [Food Systems Dashboard](#) which provides an overview of food systems around the world. It covers the three Ds: describing national systems, diagnosing them, then deciding which action to take by compiling data from 230 countries and over 170 indicators.

<sup>21</sup> **Official labels of quality and origin (SIQO)**: in the EU, there are official logos denoting products awarded an official label of quality or origin.

<sup>22</sup> **Protected designation of origin (PDO)** is a European label guaranteeing that the product has been processed and prepared in a given geographical area and protecting the name of the product throughout the EU. **Protected geographical indication (PGI)** is a European label denoting a product whose characteristics are linked to the geographical environment in which it was produced, processed or prepared using specific know-how. **Organic farming (AB)** is a European certification based on a detailed set of criteria.

<sup>23</sup> See the *World Conference on the revitalization of the Mediterranean Diet*, Palermo, May 2019.

- 8) **Startup "Grow well, eat well" awareness-raising campaigns** in line with the new European *Farm2fork* and *Biodiversity 2030* strategies (2020) which are setting ambitious EU targets for 2030 (reduce the use of pesticides by 50%, ensure that 25% of farming land is organic, etc.).
- 9) **Include sustainable/resilient agriculture, agronomic R&D (*agritech*), bioeconomy and food security/sovereignty in the Mediterranean region within the European programmes and funds:** Structural Funds, thematic programmes, Interreg, EIP-AGRI Agriculture and Innovation and the European neighbourhood policy, etc. like the PRIMA<sup>24</sup> programme.

## **Conclusion**

With all the uncertainty and tension in the Mediterranean region, LRAs that are members of the *ARLEM* and *CPMR Intermediterranean Commission* driving regional cooperation can act to reduce the food vulnerability of local communities and ensure that the various forms of Mediterranean farming are better able to cope with the upheaval caused by climate change.

Moving towards a food system and sustainable production and consumption patterns to deliver environmental, health, social and economic benefits within global limits: this ambition could be at the heart of a Mediterranean macro-regional strategy to be launched and broken down into a number of practical steps.

It would also be a good way to celebrate, following 2020, the 25th anniversary of the *Barcelona Conference* (1995), the initiator of the *Euro-Mediterranean Partnership*, which aimed to overcome rivalries, fractures and differences as a common mobilising horizon in the Mediterranean. In this respect, the *UN World Food Programme* (WFP), which has been awarded the *Nobel Peace Prize* in 2020, illustrates more than ever the inseparable link between food security, peace and (geo)political stability.

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<sup>24</sup> [PRIMA](#): The Partnership for Research and Innovation in the Mediterranean Region designs new R&D approaches to improve water availability and sustainable agricultural production.