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Citizenship, Governance,
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CIVEX

Agriculture and food security in climate sensitive areas in the Mediterranean



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Abbreviations

AFD	Agence Française de Développement
ARLEM	Euro-Mediterranean Regional and Local Assembly
ASMP	Association de Sauvegarde de la Médina et du Patrimoine de Kelibia (Association for the Safeguard of the Medina and Heritage of Kelibia)
CA	Conservation Agriculture
CBC MED	Cross-Border Cooperation Mediterranean Sea Basin Programme
CIHEAM	Centre International de Hautes Etudes Agronomiques Méditerranéennes (International Centre for Advanced Mediterranean Agronomic Studies)
CIHEAM	Mediterranean Agronomic Institute of Montpellier
IAMM	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (French Agricultural Research Centre for International Development)
CIRAD	Conflict Management and Mitigation
CMM	European Bank for Reconstruction and Development
EBRD	European Neighbourhood Instrument
ENI	Euro
EUR	Food and Agriculture Organisation of the United Nations
FAO	Facility for Euro-Mediterranean Investment and Partnership
FEMIP	French Association for International Agricultural Development
FERT	French Facility for Global Environment
FFEM	Güneydoğu Anadolu Projesi (Southeastern Anatolia Project)
GAP	Groupement de Développement Agricole (Agricultural Development Group)
GDA	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GIZ	Global Soil Partnership
GSP	International Center for Agricultural Research in the Dry Areas
ICARDA	International Food Policy Research Institute
IFPRI	Institut de Prospective Economique du Monde Méditerranéen (Mediterranean World Economic Foresight Institute)
IPEMED	Institut de Recherche pour le Développement (Research Institute for Development)
IRD	Local and Regional Authority
LRA	Mediterranean Action Plan
MAP	Mediterranean Experts on Climate and Environmental Change
MedECC	Middle East and North Africa
MENA	Near East North Africa

NENA	Non-Governmental Organization
NGO	Organisation for Economic Co-operation and Development
OECD	Public-Private Partnerships
PPP	Partnership for Research and Innovation in the Mediterranean
PRIMA	Area Innovation Network Mediterranean Agro-systems
RCM	Sustainable Development Goal
SDG	Swedish International Development Agency
SIDA	Small and Medium-Sized Enterprises
SME	Sustainable Soil Management
SSM	Union for the Mediterranean
UfM	United Nations Development Programme
UNDP	United Nations Environment Programme
UNEP	United States Agency for International Development
USAID	United States Dollar
USD	Water, Energy and Food
WEF	Wastewater Treatment Plants
WWTP	Wastewater Treatment Plants

1. Blocking points, solutions and policy recommendations

The Mediterranean region¹ is characterised by very limited arable land resources, 95% of which are already farmed (UfM, 2016). With almost no room left for the expansion of cultivated areas, the future of Mediterranean agriculture and its contribution to food security relies on the preservation of fragile lands threatened by climate change, unsustainable exploitation and population growth (MedECC, 2019).

In the water-poor Mediterranean region, people have always had to cope with scarcity, developing adaptation strategies to meet their most essential needs. However, the adaptation capacities in place are put to the test by climate change, which threatens to increase the number of water-poor people in the region from 180 million in 2013 to more than 250 million within the next 20 years (MedECC, 2019). In the meantime, unsustainable water use and wastage contribute to the depletion of the resources at a time when water needs driven by economic and demographic growth are ever-increasing (MedECC, 2019).

Closely related are the issues of food security – understood as people having ‘at all times (...) physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life’ (WFS, 1996) regardless of the food’s origin and the conditions under which it is produced and distributed² – and food sovereignty. The latter requires that production be sustainable, just and, most importantly, local, guaranteeing universal access to available products. Food sovereignty (Gordillo, 2013) enhances community control of resources and workers, and supports climate and resource-friendly techniques, local distribution channels, and the social protection of small and medium producers, and is particularly crucial given the already mentioned rapid population growth.

Agroecology, ‘an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems’ (FAO, 2019c) might contribute to the mitigation of some of the above-mentioned problems related to food sovereignty. Essentially, by optimising the interactions between people, animals and plants, it enables the advancement of sustainable agriculture as well as climate change mitigation and adaptation strategies, for example due to its requirement to use natural methods

¹ The present report refers to the following countries: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine (this designation should not be understood as the recognition of a State of Palestine by the European Union or any of its Member States), Tunisia and Turkey.

² FAO website: Food Security Statistics, <http://www.fao.org/economic/ess/ess-fs/en> (accessed: 7 June 2020).

to improve soil quality, for instance through available biomass. Moreover, it aims to promote the ancestral knowledge of healthy, balanced and more resilient production. Finally, it has a positive impact on broader ecosystems as all agroecological techniques require the conservation of biodiversity.

1.1. General governance and institutional obstacles and solutions

Blocking points

Lack of a long-term and integrated vision

Although almost all of the countries of the Southern and Eastern Mediterranean have developed national strategies and plans to drive a shift to the sustainable management of natural resources, there is a general lack of a long-term, comprehensive and integrated vision in their implementation (Lacirignola et al., 2017). According to our interviewees, management policies are often sectorial, fragmented and prone to applying ready-made solutions to issues that are deeply interconnected, thus failing to take into account the bigger picture. For example, increasing water use efficiency in agriculture is not only about replacing surface irrigation by drip irrigation but it also must embrace a larger vision including the management and maintenance of the infrastructure, the distribution scheme of the water, access to technology, the training of farmers and the dissemination of knowledge, pricing policies and the monitoring and evaluation of the implemented measures. A long-term comprehensive vision should also take into account the socio-economic dimension of soil and water management, as well as food security issues (CIHEAM and FAO, 2016). More generally, we identified a lack of awareness and knowledge among involved stakeholders, very limited availability of up-to-date data, the absence of monitoring and evaluation processes, the fragmentation of responsibilities and a lack of coordination between different authorities, and shortages of financial and human resources as factors hindering the adoption and implementation of an integrated agriculture and food security vision.

Lack of awareness

Soil protection and conservation are usually not among the top priorities on the agendas of policymakers (FAO and GSP, 2015), notably due to the lack of awareness and knowledge of the importance and extent of the issue. Long-term economic and environmental benefits are sometimes not considered by local

stakeholders, including farmers, when the short-term narrative revolving around productivity and rentability prevails. In addition, according to our interviewees, good practices and particularly sustainable soil management (SSM) are not sufficiently disseminated among stakeholders (policymakers, civil servants, agricultural advisors and farmers). A culture of scarcity related to water resources among farmers is, in general, missing. Although they may recognise the impact of climate change on the availability of the resource, they lack the necessary information and financial means to develop adequate coping strategies or to convert to more sustainable practices. Water users usually expect public authorities to meet their needs through an increase in water supply rather than considering an adjustment in water usage patterns, according to one of our interviewees.

Lack of monitoring and evaluation processes

While the piloting of programmes is typically done at the level of the whole country (although in Jordan, for instance, pilot programmes have been implemented in individual governorates and municipalities as well), there is a lack of monitoring and evaluation (M&E) at all levels. Yet, M&E is crucial for the proper design of policies and strategies and for making evidence-based decisions. International development agencies usually carry out M&E during the lifetime of the projects they implement, but no follow-up is done over the long term. Expectations of the above patterns and a lack of long-run incentives may lead to the short-sighted horizon of the implemented programmes.

Fragmentation of responsibilities and lack of coordination between different national authorities

The governance landscape for the management of agricultural soils and water resources is characterised by a great number of authorities (several ministries, agricultural and/or water authorities, water basin agencies, local and regional authorities [LRAs], water users and farmers associations) intervening at different levels of the management chain with different rules. While water resources are oftentimes managed by local agencies, i.e. in Jordan and Egypt, as one of the stakeholders interviewed rightly noted, land management and innovative agriculture are predominantly the central government's prerogative. Nonetheless, despite some institutional reforms aimed at improving the water governance framework, there is often insufficient coordination between different national, regional and local authorities or an unclear division of responsibilities to ensure that efforts are not wasted with overlapping actions and that interventions are adapted to local realities. Participatory approaches, with the exception of some projects implemented by foreign donors, i.e. GIZ (e.g. 'Participatory development

programme in urban areas'³), are uncommon in regional governance settings despite being crucial to encouraging responsibility, adaptation to local contexts and bottom-up strategies.

Lack of power and resources of LRAs

Sustainable land management is based on targeted policies and institutional support at the local level, participatory approaches and partnerships at all levels (Zdruli et al., 2016), thus requiring LRAs to take an active role in the management of natural resources in the context of climate change. However, the management of agricultural soils, water resources, agroecology and food security are still insufficiently decentralised despite significant advances in some countries. In the water sector, a number of Southern and Eastern Mediterranean countries (Morocco, Algeria, Lebanon, Turkey) have decentralised water management to the water basin level so as to achieve integrated management of the resource that goes beyond inoperative administrative divisions and reflects the specific and different needs of each basin. Basin organisations were created and made responsible for the planification of water resources and their quality control, including multiple stakeholders in their boards (e.g. representatives of LRAs). Water supply and sanitation are usually delegated to autonomous public service providers, private operators or public-private partnerships (PPP) when not depending directly on ministerial agencies (as is the case in Lebanon, Tunisia, Jordan and Egypt). Yet, local authorities, such as municipalities, are usually not involved in decision-making, and their powers are often restricted to the management of water in public spaces. Moreover, water management usually implies investing in costly infrastructure and maintenance projects that LRAs cannot afford. Human resources are often lacking in decentralised water authorities: they often struggle, for instance, to ensure water policing due to a lack of staff. For one of our stakeholders, the lack of power of LRAs implies a bigger 'social control' obstacle. For example, in Egypt, where 40% of the political electorate live in rural areas, central authorities tend to adapt their actions to societal expectations. In one interviewee's opinion, given the chance, LRAs would be willing to impose stricter measures on water usage, despite it being an unpopular decision among the citizens

³ <https://www.giz.de/en/worldwide/16278.html> (accessed: 8 June 2020).

Lack of access to reliable and up-to-date data

The sustainable and integrated management of agricultural soils and water resources has to be based on relevant, updated and harmonised data to feed scientific research, guide policymaking and, notably, to enable the accurate monitoring of the impacts of climate change and to forecast major climatic hazards. This is crucial to determine adaptation strategies for soil degradation and an increasing water scarcity which are tailored to local contexts. However, as suggested by both the interviewees and some recent studies (e.g. FAO and GSP, 2015), data regarding soil and water resources, as well as eco-innovative agricultural techniques, are often lacking, outdated, fragmented or difficult to access in most of the Southern and Eastern Mediterranean countries. One of our interviewees noted that even when reliable data sources are gathered, they are oftentimes gathered in cooperation with donors, and hence are available only in English, which not everyone speaks.

Proposed Solutions and Recommendations

National, local and regional authorities need to **adopt a long-term, integrated vision of the management of natural resources**. Their actions should not focus on one solution, one strategy or one sector, but rather should consider all relevant interactions and dimensions of the issues, including socio-economic issues. For instance, although the management of the water supply is always a key priority of water management policies, it is necessary to further develop water demand management to include more complex and consistent policies that will support the development of ‘soft’ skills in the long run. Similarly, water management should not focus only on irrigated agriculture but should also address issues affecting rainfed agriculture, which constitutes the bulk of agriculture and significantly contributes to food security in Southern and Eastern Mediterranean countries (CIHEAM and FAO, 2016). In this regard, the principles of Sustainable Land Management, defined by the United Nations in 1992 as ‘the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions’ (UNCCD, n/d) should be adopted and promoted.

Considering the low level of awareness concerning the importance of taking measures to safeguard natural resources, **LRAs have a major role to play through awareness-raising campaigns**⁴. Teaming up with academia, non-governmental organizations (NGOs), international institutions, extension services

⁴ Each section contains 1-2 underlined solutions, which were deemed most important and feasible to implement by the LRAs.

and agriculture advisors, and LRAs from other countries (e.g. through twinning programmes⁵), regional civil servants could achieve greater capacities to reach out to larger audiences and develop communication strategies that go beyond one-off campaigns. Awareness-raising campaigns could be based on showcasing best practices and local ‘environment champions’ and include cost-benefit approaches (e.g. the costs of irrigation schemes/soil conservation practices versus short-term and long-term productivity benefits) so as to overcome resistance to change and modernisation.

Partnerships created with academia, civil society, international cooperation and agriculture extension services should also focus on developing capacity building activities aimed at **enhancing the knowledge and know-how of local stakeholders**, especially farmers. Capacity building should be flexible in its implementation to ensure its adaptation to local realities (instead of the usual one-size-fits-all training curricula) and it should target women (who comprise more than 60% of the agriculture workforce in Jordan, Libya and Palestine [Najjar and Badstue, 2020]) with a gender-sensitive approach. As suggested by our interviewees, LRAs should insist on positioning youth at the centre of capacity building actions: with their higher environmental sensitivity and their familiarity with new technologies, they are inclined to develop innovative and smart solutions while being entrenched in their local context.

As a way to tackle the lack of coordination between authorities, as well as the lack of data and monitoring, **LRAs could support the establishment of regional platforms** in the form of agricultural observatories. Their mandate could include coordination and communication between different bodies involved in the management of soil and water resources, the collection of data produced by different stakeholders in updated and harmonised databases accessible to researchers and policymakers, and the monitoring of the state of natural resources through sustainability indicators.

Participatory approaches, as a pillar of the sustainable management of natural resources, need to be adopted by LRAs through the **establishment of direct dialogues with local communities of farmers**. The association of farmers and water users should be encouraged and empowered by LRAs beyond a consultative role to allow them to participate in the policymaking process. This approach would ensure that solutions are based on local realities, experiences and needs while developing mutual understanding, shared responsibility and a sense of ownership among local communities. These dialogue platforms promoted by local authorities should not only involve farmer associations, but should also gather all local stakeholders (policymakers, researchers, civil society representatives and

⁵ https://ec.europa.eu/neighbourhood-enlargement/tenders/twinning_en (accessed: 8 June 2020).

agricultural advisors) around the need to find local solutions, thus creating local partnerships for the sustainable management of natural resources and food security.

Good practices and useful examples:

- Awareness raising: A project in Tunisia, promoted by the University of Manouba, the Association de Sauvegarde de la Médina et du Patrimoine de Kelibia (ASMP), the Municipality of Kelibia and the Institut National du Patrimoine, is a good example of a multi-stakeholder awareness raising campaign on water consumption and scarcity which involves youth in the search for sustainable solutions to water scarcity in schools and houses (Garcia et al., 2019).
- Awareness raising and community involvement: The project ‘Good Water Neighbours’, launched in 2001 by the NGO ‘Ecopeace Middle East’, brings together Jordanian, Palestinian and Israeli environmentalists with support from the Swedish International Development Agency (SIDA) and USAID West Bank/Gaza CMM. The project aims at raising awareness on water issues affecting neighbouring local communities and municipalities across the Jordan-Israel-Palestine borders by creating platforms for dialogue to develop common solutions to shared water issues and working together to secure funds for their implementation⁶.

1.2. Management of Agricultural Soils

Blocking points

Erosion, salinisation and the phenomenon of acidification lead to soil degradation, which is exacerbated by climate change

While Mediterranean soils are naturally particularly exposed to erosion (linked to wind and water erosion, relief, poor soils, sparse vegetation) and characterised by their high degree of fragility (Raclot et al., 2016), extreme climate events induced by climate change are expected to further degrade soils in Southern and Eastern Mediterranean countries (Raclot et al., 2016). Higher temperatures and more frequent droughts as well as intense rainfalls, wildfires, sea-level rise and salt water intrusion into fresh aquifers contribute to the worsening of erosion and the phenomenon of salinisation which leads to desertification. The resulting soil degradation eventually leads to a dramatic decline in agricultural productivity that translates into a loss of revenue for farmers, the exacerbation of rural poverty and

⁶ <https://ecopeaceme.org/projects/community-involvement/> (accessed: 9 June 2020).

intensification of the rural exodus, and the deterioration of food security⁷. In turn, the deteriorating soil productivity and increasing aridity will eventually lead to an upward shift in the demand for irrigation water.

Unsustainable use and mismanagement of agricultural soils

Agriculture in Southern and Eastern Mediterranean countries is responsible for – and at the same time a victim of – agricultural soil degradation. Unsustainable agricultural practices, including over-cultivation and exploitation, overgrazing, excessive and poor-quality irrigation and the overuse of chemical fertilisers, among other factors, are contributing to a great extent to soil degradation (UNEP/MAP, 2016).

Urbanisation and change in land use

Urbanisation is a major factor contributing to the loss of agricultural soils in the Mediterranean. Unplanned urban expansion driven by high population growth is indeed further reducing the availability of arable lands in Southern and Eastern Mediterranean countries. Agricultural soils have also been lost to the expansion of economic activities such as tourism in coastal areas.

Proposed Solutions and Recommendations

The unsustainable practices of conventional agriculture contributing to soil degradation can be balanced by the **promotion and adoption of conservation agriculture** (CA). Based on three principles (minimum tillage and soil disturbance; permanent soil cover; and crop rotation and intercropping), CA is one way to protect the soil, enhance biodiversity and improve productivity while reducing costs (fuel, fertilisers, time and labour) (Zdruli et al., 2016). LRAs should consider working with agricultural extension programmes, research institutes and farmer associations to promote the dissemination of CA, showcasing its benefits and supporting its adoption through training, technical assistance and assessment, and economic incentives (payments for ecosystem services and subsidies for technology and machinery).

Municipalities have a role to play in **preventing the loss of arable lands to urbanisation and even reclaiming space for agriculture**. Urban and land use planning should take into account the potential of land and soil as a resource for food production and security (the balance of the land use allocations, the

⁷ <http://www.fao.org/soils-portal/soil-management/soil-conservation/en/> (accessed: 15 June 2020)

promotion of urban agriculture, the revitalisation of degraded areas and the re-development of core city areas).

Good practices and useful examples

- The Marsadev Project (Matrouh Rural Sustainable Development Project, 2014-2017), funded by the Italian Government and implemented by CIHEAM and the Desert Research Centre of Marsa Matrouh in Egypt, is a good example of actions aimed at recovering degraded lands, preventing erosion and harvesting water for irrigation in arid regions. Its objective was to ‘green the desert’, and reclaim an agriculture area (intercropping olives, figs and Vicia Faba) for the benefit of local communities, thanks to both modern technology and tradition⁸.
- The Innovation Network Mediterranean of Agro-systems (formerly Mediterranean Network Cultures - RCM) gathers farmer associations and research institutes from Spain, Algeria, France, Tunisia, Morocco, Lebanon and Portugal, as well as international organisations and NGOs to carry out field work, group facilitation and international meetings to develop conservation agriculture in the Mediterranean. In this framework, a useful booklet on conservation agriculture in the Maghreb was produced, summarising good farming practices and the role of different actors, including public authorities⁹.

1.3. Management of Water Resources

Blocking points

Increasing water scarcity

Climate change is expected to further increase the stress on scarce water resources through the decrease and irregularity of rainfalls, as well as higher temperatures, accelerating evaporation and desertification (MedECC, 2019). Most of the agriculture in the region, which is rainfed, will suffer greatly from increased water scarcity.

⁸ <https://www.facebook.com/Marsadev-project-Egypt-784471981631262/> (accessed: 22 June 2020).

⁹ <https://www.fert.fr/en/animation-du-reseau-rcm-et-renforcement-des-capacites-des-groupes-dagriculteurs-pour-ladaptation-au-changement-climatique-et-la-promotion-de-lagriculture-de-conservation-en/> (accessed: 22 June 2020)

Overexploitation of surface and groundwater resources

Coupled with rapid demographic growth in the region, the socio-economic development of Southern and Eastern Mediterranean countries has given way to increased pressure on water resources. Agriculture (between 78% and 84% of the demand for fresh water in Southern and Eastern Mediterranean countries [Deboos, 2018]), with the development of irrigation and water-demanding crops, is first and foremost leading to the unsustainable exploitation of surface and groundwater resources. While groundwater is often the only resource available in arid areas, especially in the Sahara from Morocco to Egypt, controlled and uncontrolled pumping exceeding the natural recharge capacity of aquifers is putting the sustainability of the resource under threat. In addition to intensive exploitation, surface and groundwater resources are also suffering from pollution and salinisation, deteriorating their quality (CIHEAM and FAO, 2016).

High water wastage/low water efficiency

Available data show that a considerable volume of water is lost due to a lack of efficiency in water conveyance systems and irrigation. In fact, the average irrigation water efficiency in Turkey is reported to be 45%, and ranges from 30% to 90% depending on regional conditions (Santos et al., 2016). A shift from the widespread surface gravity irrigation systems to drip and adapted high water-efficient irrigation, in addition to the modernisation of conveyance systems, could save up to 35% of the water resources in the Mediterranean (Fader et al., 2016).

Proposed Solutions and Recommendations

Reducing water wastage and improving water efficiency should be the priority for the sustainable management of water resources. As mentioned above, there is a significant potential for improvement, not only in the irrigated agriculture sector but also in the use of water in the public sector and in industry, including tourism. In order to increase water efficiency, **investments to modernise water conveyance infrastructure and to provide maintenance** are required in rural and urban areas. Given their limited budgets, LRAs should consider using PPPs and international development funds to secure the necessary financial support. **Increasing water efficiency in public buildings** is another important step that LRAs can take. It would also allow them to set a positive example, act as a catalyst for changing mindsets, and save costs. A myriad of guides, such as the USAID and Ministry of Water and Irrigation of Jordan ‘Office Buildings Water Efficiency Guide’¹⁰, which is available online, provide great insights on the best practices and technology to support a considerable reduction in water wastage.

¹⁰ <https://jordankmportal.com/resources/office-buildings-water-efficiency-guide-english> (accessed: 8 June 2020).

When addressing the lack of **water efficiency of irrigated agriculture at the parcel level**, a number of practices are already well known and ready to be implemented by farmers, including a shift from surface gravity systems to drip irrigation, the modernisation of irrigation systems, the use of technology for irrigation planification and piloting, the adoption of less water-demanding crops and mulching practices. The implementation of these practices should **be tailored strictly to each local context**, accompanied and supported by national, regional and local authorities through capacity-building, training and economic incentives (tax exemptions, subsidies, access to finance), and should be monitored and evaluated in the long term.

Greater **mobilisation of non-conventional water resources** is part of the recommended policy toolbox for LRAs and can considerably enrich the supply-side management of water resources. Most Southern and Eastern Mediterranean countries are still lagging behind in terms of wastewater treatment, with the notable exceptions of Israel (93% of wastewater treated) and Jordan (88%) (Deboos, 2018). Compatible with the concepts of the circular economy, **wastewater treatment reuse** has a significant potential to preserve resources in agricultural irrigation and can also serve as a way to restore groundwater capacities and humid zones. However, intensifying the use of wastewater treatment reuse requires overcoming a number of constraints: the high quality of treatment required for irrigation, high costs, inadequate legislation, limited social acceptance and viability issues, among others. LRAs can help to overcome these barriers by seeking financial support for wastewater treatment plants (WWTP) through PPPs, international cooperation and water NGOs; launching awareness raising actions to enhance social acceptance of the practice by highlighting the quality of water and transparency of information; and, finally, by using treated wastewater for the irrigation of the urban landscape, recreational areas and in public cleaning services. The decentralisation of WWTP should also be promoted at the semi-urban and rural municipality level where they can help to solve local shortages and restore degraded soils. A number of great examples exist in this regard, including the pilot projects implemented by the German development agency (GIZ) in the framework of the SWIM Sustain Water MED Project, in Ait-Idir (Morocco), Oueljet el-Khoder (Tunisia) and Al Gozzayera (Egypt), which tackle local water-management related challenges and highlight the benefits, risks and lessons learned (GIZ, 2016).

Good practices and useful examples

- The decentralised and multi-stakeholder approach of water management and the restoration of agricultural soils: the association Groupement de Développement Agricole (GDA) in Sidi Amor (north of Tunis, Tunisia) has become a model of sustainable water management through the adoption of water-efficient irrigation systems (drip irrigation, mulching) and the reuse of treated wastewater, combined with soil conservation and biodiversity protection. It has created partnerships with local, national and international stakeholders¹¹.

1.4. Development of agroecology and new eco-innovative agricultural techniques

Main blocking points

Lack of local biodiversity-oriented strategies

According to the FAO Regional Office for the Near East and North Africa website, biodiversity in ‘the Near East and North Africa is under serious danger, threatening the way food is being produced’. In fact, the ‘biodiversity of the region’s production systems faces many threats, including destructive land- and water-use practices, climate change, pollution of various kinds, invasive species and the impacts of military conflicts’ (FAO, 2019a). In order to feed a growing population while coping with challenges related to the climate emergency, biodiversity needs to be ensured not only in agriculture but also in local fishing and forestry practices as well as in livestock.

Lack of local seed banks and registers

For one of our interviewees, the non-recognition of local seeds is one of the largest obstacles in the region. In Tunisia, for example, locally produced seeds cannot be officially registered or used for agricultural purposes and, effectively, cannot be reproduced, forcing local farmers to buy registered seeds from foreign companies (which oftentimes are working on chemical and pesticide production as well).

¹¹ <https://www.sidiamor.org/gda1/> (accessed: 9 June 2020).

Preferences of potential consumers and lack of awareness

Multiple studies (i.e. OECD-FAO, 2018 and Golzarand et al., 2013) show that especially the region's younger generation prefers Western-type processed foodstuffs and fast food instead of more resilient ancestral products and species, even though the latter are typically of a higher nutritional value and oftentimes cheaper. Effectively, such products are less and less popular, and in some cases already endangered.

Undeveloped market

According to one of our interviewees, even when local farmers provide region-specific products to the market, these are often exported to other parts of the country, or even abroad. This is because the local communities or restaurants that could potentially buy them are not aware of their availability or simply cannot afford more eco-friendly products. Small-scale farmers who produce food in a more sustainable manner need to compete with large producers; hence, the prices they offer are less competitive.

Low labour productivity

Labour productivity in agriculture across the MENA region keeps falling behind productivity in other sectors. As a result, production growth is slower than labour force growth in agriculture. Local policies prioritising the protection of staple crops seem to have exacerbated this labour productivity gap and have been costly not only in terms of public expenditures but also in terms of productivity growth (Pratt et al., 2019) and openness to innovations. Hence, interest in agri-innovations is respectively smaller than for/in other sectors of the economy.

Lack of funding

Lack of funding does not have to be specifically related to investments in innovative agricultural techniques, as even marginal stresses can negatively impact farmers, predominately small-scale farmers. Studies (i.e. OECD-FAO, 2018) show that, across the region, even the most basic agri-related purchase can be blocked when, for example, fuel prices are high (impacting the irrigation of crops and forcing farmers to plant dried out seeds saved from the previous year). Other examples related to limited funding opportunities include access for local cooperatives. Even in countries where these work well, such as in Morocco, there is still significant room for expansion of their small-scale financing (Dias Pereira et al., 2018).

Quality of infrastructure

Current developments in agriculture focus on efficient and sustainable irrigation systems that include innovative water treatment solutions which are not common in the region under consideration (with the exception of some locations around Egypt) (Mirra, 2017). Similarly, when it comes to the quality of transportation infrastructure, despite recent improvements, many local and regional roads are of bad quality, and railways are largely non-existent, which significantly impacts food supply chains.

Proposed Solutions and Recommendations

Introduction, coordination and knowledge exchange on local/regional biodiversity plans or strategies. As biodiversity is now on the agenda, for example in Beirut¹², and some Moroccan cities have a good system of implementing biodiversity conservation, they could serve as ‘lighthouse projects’, building on the best practices from H2020 projects, for other cities across the region. Such coordination and exchange of experiences would strengthen cross-border cooperation as well.

The organisation of local training/workshop sessions for farmers and cooperative members to introduce the concepts of agroecology and innovation in agriculture overall. Workshop sessions could be coupled with small grants for those interested in agroecology pilot programmes.

The revolutions in the Arab world have sparked ‘a flow of entrepreneurial energy and an increased sense of empowerment among the youth, translating into an array of social entrepreneurial ventures tackling cultural activities, health, agriculture, water and sanitation, and women’s empowerment’ (Jamali and Lanteri, 2015). Some of our interviewees believe that this momentum should be used by LRAs to promote agroecology among all age groups. **The creation of a city/local budget-backed incubator for agroecology ideas** could help those interested in conceptualising their initial thoughts into clean-/green-tech companies.

The creation of practical guidelines, either in the form of maps or brochures, preserving the local gastronomic heritage should be considered by LRAs. For example, the Food Heritage Foundation¹³ from Lebanon managed to secure its culinary traditions by reinventing food tourism and reopening community kitchens and farmers’ markets.

¹²

https://www.aub.edu.lb/ifi/Documents/publications/docs/beirut_zone/20180921_beirut_zone_10_location_map_5.pdf (accessed: 8 June 2020).

¹³ <https://food-heritage.org> (accessed: 11 June 2020).

Good practices and useful examples

- The example of the Ark of Taste¹⁴, which managed to save traditional Israeli bread, shows that securing endangered local food products, i.e. cheeses or bread, can be successful if supported by tailored campaigns.
- Seed protection: the Palestine Heirloom Seed Library¹⁵ was created in 2016 to both identify and preserve ancient seeds and traditional, ancestral farming practices. The initiative's founder, Vivien Sansour, aims to enable seed revival and to link them with cultural stories. This locally tailored approach enables dissemination activities targeting local citizens and communal discussions about natural resources and biodiversity. Furthermore, it has an educational component – schoolchildren have the opportunity to reflect on traditional farming techniques.
- The Lebanese start-up 'The Good Thymes'¹⁶ has reintroduced traditional and nutritious Lebanese savours through the promotion of wild Lebanese thyme which is natural and without any artificial colours or flavours.

1.5. Support for food security and sovereignty

Main blocking points

Regulatory obstacles and restrictive urban/local policies

Although food production is typically conducted in the countryside, there is some untapped potential for quickly growing cities and their suburbs to partially take over duties from rural partners, i.e. by producing herbs and vegetables (small-scale farms) in urban conditions. City planners and agencies – when they are involved in urban design at all (in Lebanon, for instance, one study claims that as much as '85% of the territory is unplanned'¹⁷) (Public Works Studio, 2018) – rarely envisage space (interviews; Tawk et al., 2014) for such actions in the urban space, and only home-production is pursued. As one of the interviewees noticed, in Tunisia, there are almost no green spaces in cities, and initiatives aimed at changing this unfortunate status quo, driven by young people, thus far mostly take place in the urban peripheries. Urban agriculture in the non-EU ARLEM countries under study might not be a novel concept, yet it still suffers from lack of recognition by urban officials, and even by its practitioners. Suitable local

¹⁴ <https://www.fondazioneSlowFood.com/en/ark-of-taste-slow-food/handmade-matzos/> (accessed: 11 June 2020).

¹⁵ <https://www.facebook.com/palestineheirloomseeds/> (accessed: 11 June 2020).

¹⁶ <https://www.thegoodthymes.me> (accessed: 11 June 2020).

¹⁷ <https://www.legal-agenda.com/article.php?id=4271> (accessed: 12 June 2020).

policies, strategies and regulations concerning existing urban agricultural lands and other urban fertile areas need to be introduced.

Significant food losses and waste

Our interviewees emphasised the problem of food losses and food waste. The former in fact occurs at all levels – ‘from post-harvest up to, but not including, the retail level’¹⁸ – which is directly related to insufficient drying and refrigeration solutions. Indeed, the FAO Regional Office for the Near East and North Africa (2020)¹⁹ estimates that: i) the region imports around 36 million tonnes of wheat per year, yet over 16 million tonnes of wheat is wasted each year. Additionally, ‘50% of fruits and vegetables, 16% of meat and 27% of fish and seafood’ is wasted annually; ii) ‘the region wastes up to 30% of its scarce natural resources and energy as a result of lost or wasted food’ despite being extremely water-scarce already.

Small-scale farming vulnerability

Small- and medium-scale farmers play a major role in the region’s food security. According to Marzin et al. (2017), each year, they provide around 80% of crops and livestock. They also possess between 75% and 85% of agricultural land across the MENA region (Ibidem). However, small-scale farmers remain particularly vulnerable to the impacts of climate change and other environmental externalities.

Domination of monocultures

The region is characterised by undiversified low-yield agriculture. In some Southern and Eastern Mediterranean countries, cereals take up approximately 60% of the harvested fields but represent only 15% of the value of gross agricultural production (OECD-FAO, 2018 – data for 2014). Although cereal production has been encouraged to lower import dependence, such monoculture is negatively impacting the quality of arable soils in the region and effectively hinders food security. Furthermore, a meat- and wheat-intensive diets contribute to high overweight and obesity levels across the region (El-Sayed, 2017).

¹⁸ <http://www.fao.org/food-loss-and-food-waste/en/> (accessed: 11 June 2020).

¹⁹ <http://www.fao.org/neareast/perspectives/food-waste/en/> (accessed: 11 June 2020).

Import dependence for basic foods impacting food prices

The narrow scope for expansion in the arable area in Southern and Eastern Mediterranean countries, coupled with the growing gap between consumption and domestic production, has been covered by imports, especially of cereals, meat and oilseeds (Dias Pereira et al., 2018). Furthermore, some foodstuffs, even for imported products, are subsidised throughout the region – for instance, wheat in Egypt, Morocco and Tunisia (OECD-FAO, 2018). Nevertheless, food prices remain high. In fact, in some Southern and Eastern Mediterranean countries, including Egypt, Algeria and Morocco, citizens spend around one-third of their disposable income (compared to 12.1% on average in the EU²⁰) on food products, which makes them particularly vulnerable to food price inflation (Woertz et al., 2018).

Proposed Solutions and Recommendations

Reducing the vulnerability of small-scale farmers to climate shocks should be a priority. As extreme weather conditions are expected to be more frequent, LRAs that do have some budget autonomy could earmark a portion of their budgets to support the adaptation of small-scale farmers rather than spending all their funds on mitigation, as both policies are equally important.

The co-creation of policies for urban agriculture should take place in a participatory and multi-stakeholder manner and should be led by respective LRAs, as has been the case in Amman for some time (where participatory policy co-creation policies have been in place since 2009) (Khirfan and Momani, 2017; Tawk et al., 2014). As one of the stakeholders representing the private sector mentioned, this is of special importance for innovative installations such as aquaponic systems, if the right legislation is in place.

At the same time, according to one of our interviewees, local/regional actions targeted at responsible water and soil management should not be neglected. Our stakeholder believes that LRAs should remember that in places where land and water resources are already scarce, it might be wiser to reduce agriculture that has a negative impact on carbon footprint and water accessibility and quality, despite the unpopularity of such actions. The environment would be safer if large-scale agriculture were not in place and regions without arable land could simply rely more on global markets (see also, e.g. Pratt et al., 2019). This would open new commercial partnership opportunities for LRAs. The stakeholder representing academia strongly believes that food self-sufficiency is popular these days, but it cannot be available everywhere.

²⁰ <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20191209-1> (accessed: 11 June 2020).

LRAs should be responsible for the **creation of databases involving all local producers** so that local distribution channels are as localised as possible. For example, SEKEM²¹ – a private organisation launched in Egypt in 1977 to ‘bring about cultural renewal on a sustainable basis’ – not only managed to produce organic and biodynamic products but also to associate all interested parties from the region, creating a large database of environment friendly producers. In terms prevention of food waste, solutions implemented e.g. in Italy, such as offering **tax cuts to companies that donate food** instead of throwing it away, could be considered. Standards regarding food storage should be upgraded as well.

Building on the experiences of the Arab Group for the Protection of Nature in Jordan, LRAs from other countries in the region could assign a person or a group of representatives to be responsible for **the creation of education schemes for the youngest**. This could involve planting diverse plants across the country so that children can quickly understand the need for the development of sustainable permaculture.

Good practices and useful examples

- Israel has been actively engaged in combating global food waste both by implementing thematic regulations at the national and local levels, as well as via partnerships with food banks and associations alike. For example, Leket Israel²² – the National Food Bank – cooperates with all actors, including LRAs, willing to diminish the problem of food waste. Furthermore, Leket provides the products no longer suitable for human consumption to farmers who, instead of wasting the resources, use them to feed animals.
- Although aquaponics and hydroponics systems will not ensure food security for the growing populations in the non-EU Mediterranean countries, especially in Egypt, they may significantly contribute to achieving food sovereignty and initiate some changes in diets across the region. Bustan Aquaponics²³ – the first Egyptian commercial aquaponics farm created in 2011 – already provides fresh and pesticide-free vegetables and fish to numerous stores and markets, especially in Cairo. According to Faris Farrag, the founder of Bustan Aquaponics, the company has managed to create a natural system which uses around 90% less water than traditional farming practices.

²¹ <https://www.sekem.com/en/index/> (accessed: 11 June 2020).

²² <https://www.leket.org/en/> (accessed: 12 June 2020).

²³ <http://bustanaquaponics.com> (accessed: 12 June 2020).

- The National Observatory for Food Sovereignty and the Environment²⁴ (Observatoire de la Souveraineté Alimentaire et de l'Environnement) from Tunisia is currently working on large-scale agricultural reform. Their Agrarian Green Deal (working title) aims to rethink food production techniques in the region from scratch. Researchers have already started an inclusive, participatory process for interested stakeholders. They plan to discuss potential ideas with LRAs from across the region as well.
- Palestinian La Vie Café²⁵, with an edible urban garden in the centre of Ramallah that is not just a food production site (with organically grown foods) but is also a cultural spot for local communities interested in lectures, workshops and exhibits. The people behind La Vie Cafe are also responsible for the creation of the Mashjar Juthour eco-park. Within this eco-park in the suburbs of Ramallah, qualified experts give lectures on sustainable consumption patterns, the efficient management of resources and an eco-friendly lifestyle.
- The Turkish GAP Organic Agriculture Cluster²⁶ project, listed among 600 projects with good practices for the SDGs²⁷, helps farmers to introduce 'climate-appropriate crops with higher profit margins'²⁸. The project, implemented by the Ministry of Development together with the UNDP and numerous LRAs, managed to boost sustainable agriculture so significantly that the annual incomes of the farmers involved were three times higher than the cost of project implementation.

²⁴ <https://osae-marsad.org> (accessed: 11 June 2020).

²⁵ <https://www.facebook.com/LaVieRamallah/?rf=125434530864288> (accessed: 11 June 2020).

²⁶ <http://www.gap.gov.tr/en/gap-organic-agriculture-cluster-project-page-24.html> (accessed: 11 June 2020).

²⁷ <https://sustainabledevelopment.un.org/partnerships/goodpractices> (accessed: 8 June 2020).

²⁸ <https://www.un.org/development/desa/en/news/sustainable/sustainable-farming-bears-fruit.html> (accessed: 8 June 2020).

2. Funding possibilities available to LRAs²⁹

Name of the funding scheme: [PRIMA](#)

Funding body: PRIMA – Partnership for Research and Innovation in the Mediterranean Area

Theme: Management of agricultural soils, water resources management and development of agroecology

Geographical scope: Israel, Tunisia, Turkey, Algeria, Egypt, Jordan, Lebanon and Morocco

Description and other relevant info: PRIMA offers various grants for consortia (led by research and academic institutions thus far) consisting of public and private actors in the Euro-Mediterranean region who are dealing with farming, agro-food systems and value chains, as well as water resources. Each year, the thematic priorities are different as PRIMA work plans are based on the annually published PRIMA Strategic Research and Innovation Agenda (SRIA) and only after co-developed in a multi-stakeholder consultation process, in compliance with the objectives and provisions set out by EU regulations.

Name of the funding scheme: [Horizon 2020](#)

Funding body: European Commission

Theme: Food security; sustainable agriculture and forestry; marine, maritime and inland water research; and the bioeconomy

Geographical scope: EU + Turkey, Israel and Tunisia

Description and other relevant info: Horizon 2020, the EU research and innovation programme, is open to three non-EU member Mediterranean countries (Turkey, Israel and Tunisia) as associated countries. The two-year programmes support research and innovation activities in the following areas: agriculture and forestry (food security, environmental sustainability and economic opportunities through agriculture), environment and climate action (a resource, water-efficient and climate change resilient economy and society), and food and a healthy diet (access to safe, healthy, high quality and affordable food). The success rates of applications are quite low (Turkey: 10.20%; Israel: 13.29%; Tunisia: 18.56%; average: 12.18%). Most of these calls require at least three partners. While in the past, the most successful applicants are research and academic institutions, LRAs – especially Turkish municipalities – have also been granted funding as part of H2020 consortia.

²⁹ The descriptions of the funding schemes may be directly quoted from the original sources indicated in the links. See also Annex 3 for a matrix linking funding schemes to solutions proposed.

Name of the funding scheme: [ENI - European Neighbourhood Instrument](#)

Funding Body: European Union

Theme: Bilateral level: agriculture and rural development, including food security/sustainable management of natural resources (2014-2020); multi-country level: sustainable management of natural resources, including water, green growth, the environment, and climate change adaptation and mitigation (2014-2020)

Geographical scope: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia

Description and other relevant info: The ENI offers funds through bilateral, multi-country and cross-border (see below) programmes in neighbouring countries as part of the EU Neighbourhood Policy. Priorities of the programmes include the socio-economic development of neighbouring countries, including agricultural development, food security and the sustainable management of natural resources. LRAs are priority beneficiaries and their involvement in the preparation, implementation and monitoring of the support programmes is an objective pursued by the ENI.

Name of the funding scheme: [ENI CBC MED](#)

Funding body: European Union

Theme: Environment and climate change, water efficiency (2014-2020)

Geographical scope: Algeria (14 territories), Egypt (13 territories), Israel (whole country), Jordan (12 territories), Lebanon (whole country), Palestine (whole country) and Tunisia (22 territories).

Description and other relevant info: The ENI Cross-Border Cooperation Mediterranean Sea Basin Programme finances cooperation projects addressing economic and social development, as well as environmental challenges in the coastal territories of South Neighbouring countries. LRAs are, together with civil society organisations, the main beneficiaries of the programme, which benefited from a EUR 209 million contribution from the EU.

Name of the funding scheme: [Sea-Crossing Italy-Tunisia Programme](#)

Funding body: European Union

Theme: Environmental protection and climate change adaptation (2014-2020)

Geographical scope: 15 Tunisian governorates and 8 Italian provinces

Description and other relevant info: As part of the ENI, the Cross-Border Cooperation programme between Italy and Tunisia aims at promoting a fair and sustainable socio-economic and territorial development and integration between the two countries. Most of the beneficiaries are LRAs. Objective 3 of the programme aims at supporting common actions for the protection of the environment and the conservation and sustainable use of natural resources. The

budget allocated for the 2014-2020 period amounts to EUR 14 million for ‘strategic projects’ and EUR 16 million for ‘standard projects’. Projects are financed by the programme up to 90% of their total budget.

Name of the funding scheme: [Facility for Euro-Mediterranean Investment and Partnership \(FEMIP\)](#)

Funding body: European Investment Bank

Theme: Infrastructure, including projects in the water and irrigation sectors, and environment, including support to projects combating the causes and effects of climate change

Geographical scope: Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestine and Tunisia (Cross-border or regional projects are welcome)

Description and other relevant info: FEMIP co-finance public authorities’ projects with direct individual loans when the investment cost exceeds EUR 20-25 million and up to 50% of the total cost (to be requested directly from the EIB with a comprehensive study). Intermediated loans are offered to small and medium enterprises (SMEs) and local authorities to finance their investments below EUR 20-25 million (to be requested from financial institutions and commercial banks receiving EIB loans³⁰). The facility also offers guarantees to public sector promoters to mobilise additional resources for their infrastructures projects. Finally, the MED 5P technical advisory facility supports public authorities in Egypt, Jordan, Lebanon, Morocco and Tunisia in the preparation, procurement and implementation of PPP infrastructure projects.

Name of the funding scheme: [EBRD Project Finance](#)

Funding body: European Bank for Reconstruction and Development

Theme: Agribusiness, municipal and environmental infrastructures

Geographical scope: Morocco, Tunisia, Egypt, Jordan, Palestine, Lebanon and Turkey

Description and other relevant info: The EBRD provides loans for large projects (from EUR 3 up to 250 million) and smaller projects through local commercial banks lending to SMEs and municipalities. Under the municipal and environmental infrastructures section, the EBRD supports local governments in the delivery of essential urban services including water and wastewater treatment. EBRD loans in agribusiness target the private sector. Project promoters interested in obtaining EBRD financing can directly submit their enquiry to the Bank.

³⁰ The list is available at: <https://www.eib.org/intermediarieslist/search/index>

Name of the funding scheme: [French Facility for Global Environment \(FFEM\)](#)

Funding body: French Development Agency (AFD)

Theme: Sustainable agriculture and forests, land degradation and chemical pollutants, climate change, and sustainable consumption and production

Geographical scope: The Mediterranean as a priority intervention area

Description and other relevant info: The FFEM finances pilot programmes and innovative projects reconciling the environment and local development. On average, the FFEM grants EUR 1 million, contributing for a maximum of 30% of the total project cost (co-financing by local partners and other financial partners). The facility works with all types of actors, including LRAs. The priority is given to projects which contribute to the development of sustainable agricultural production systems; combat soil impoverishment, loss of fertility, and food insecurity; and promote integrated approaches to climate change adaptation and mitigation.

Name of the funding scheme: [The Canada Fund for Local Initiatives](#)

Funding body: Government of Canada

Theme: Management of agricultural soils, water resources management, development of agroecology, and support for food security and sovereignty

Geographical scope: Algeria, Jordan, Lebanon, Morocco, Mauritania, Palestine, Turkey, and Bosnia and Herzegovina

Description and other relevant info: The Canada Fund for Local Initiatives targets proposals centred around the needs of local communities and designed predominantly by local partners. The priority areas under this scheme include environment and climate action focusing on adaptation and mitigation, as well as on water management. The calls are announced on a yearly basis with the next one coming in 2021. LRAs are eligible to apply for the projects implemented in collaboration with local civil society organisations.

Name of the funding scheme: N/A

Funding body: [InsuResilience Solutions Fund](#)

Theme: Climate risk resilience

Geographic scope: Algeria, Egypt, Jordan, Lebanon, Mauritania, Morocco, Palestine, Tunisia, Turkey and Libya

Description and other relevant info: The project is based on co-funding and, as of the second half of 2020, has yet to be launched. LRAs are eligible to apply only in partnership with private organisations with a maximum budget of up to EUR 2.5 million. The main aim of the project is to assist local stakeholders in the development and improvement of climate risk insurance products, with a

particular focus on poor and vulnerable communities, as well as areas prone to extreme weather events.

Name of the funding scheme: [Green Cities Facility](#)

Funding body: Green Climate Fund (with the EBRD as the main partner)

Theme: Climate-resilient and low-carbon local infrastructure, water cycle management

Geographic scope: Jordan, Tunisia (among others)

Description and other relevant information: The selected municipalities are projected to benefit from about USD 7.9 million of direct and USD 15.3 million of indirect funding throughout the implementation period. The project carries an overarching goal to increase the sustainability and climate change resilience of LRAs and local communities. To this end, the priority areas include improved water cycle management, waste reduction and management, and the expansion of resilient and sustainable local infrastructure. The municipalities in the countries covered by the project could benefit from funding throughout the project implementation period (2018-2034).

3. Annotated and commented bibliography

Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM) & Food and Agriculture Organisation of the United Nations (FAO). [*Mediterra 2016. Zéro gaspillage en Méditerranée. Ressources naturelles, alimentations et connaissances.*](#) Paris: Presses de Sciences Po, 2016.

Mediterra 2016, CIHEAM's flagship publication, produced in partnership with the FAO, explores three types of waste taking place in the Mediterranean: the waste of natural resources, food and knowledge. Through 17 chapters, the publication provides an extensive outlook on these issues, innovative solutions for the sustainable management of water and soil resources, as well as policy recommendations to enhance food security, putting an emphasis on local and inclusive approaches to trigger sustainable development. The different texts are accompanied by many examples of good practices and projects promoting community-based solutions for the sustainable management of resources and enhanced knowledge for food security.

Themes: Natural Resources Management and Food Security

Geographical scope: Mediterranean Region

Deboos, Arthur. [*Réutilisation des eaux usées traitées en Méditerranée et impacts sur les territoires.*](#) IPEMED, Palimpsestes n°19, Paris, 2018.

The reuse of treated wastewater is a promising solution to the increase in water scarcity in the Mediterranean region. This report addresses this issue, highlighting the experience of a number of Mediterranean cities (Granollers in Spain, Zarqa in Jordan, Agde in France) in designing, financing and implementing wastewater treatment plant projects. The issues of treated wastewater pricing, governance (comparing Tunisia, Morocco and Jordan), and the inclusion of peri-urban and rural areas into treated wastewater schemes, are also among the elements covered by the study which ultimately provides useful recommendations to policymakers.

Themes: Water Resources Management

Geographical Scope: Mediterranean Region

El Hajj, Rana; Farajalla, Nadim; Terpstra, Tessa; Jagerskog, Andres. [*Enhancing regional cooperation in the Middle East and North Africa through the Water-Energy-Food Security Nexus.*](#) Clingendael Policy Brief, 2017.

This policy brief presents the relation between water, energy and food (WEF) insecurities across the broader MENA region. The three topics are believed to be not only closely interlinked and interconnected but also equally sensitive to already existing megatrends, including population growth, climate change and

wars and migrations. In order to promote the WEF nexus on the political agenda, in the section related to ‘the regional landscape; opportunities for cooperation on the WEF security nexus’, the authors recommend several ways of cooperation for different stakeholders from the region, including subnational actors. These include, among others: institutional knowledge exchange; targeted policy actions, such as the implementation of ideas covered by the already existing ‘Pan-Arab Strategy for the Development of Renewable Energy Applications: 2010-2030’; pan-MENA financial partnerships; and common actions towards the protection of natural resources.

Themes: Management of Agricultural Soils, Water Resources Management, Support for Food Security and Sovereignty

Geographical Scope: Middle East and North Africa (MENA) Region

FAO & Global Soil Partnership (GSP). [*Regional Implementation Plan of the NENA Soil Partnership: towards sustainable management of soil resources.*](#) Rome: FAO, 2015.

This plan presents the measures to implement the sustainable management of soil resources in the Near East and North Africa region that were endorsed during a conference in Amman, Jordan, in June 2015. Following this meeting, five important pillars were defined: improving global governance in terms of sustainable land use; promoting the research, education and awareness of soil management; fostering targeted soil research and development; improving access to land management information; and harmonising methods and indicators for the region. The implementation plan defines outcomes, activities and governance arrangements.

Themes: Agricultural Soil Management

Geographical scope: Near East and North Africa

Fundación Món-3. [*Diagnostic de l'état, utilisation et gestion de l'eau dans la ville d'Oujda.*](#) Barcelona, 2016.

Elaborated in the framework of the project ‘Support to Oujda Municipal Plan for good governance and sustainable management of water (2015-2017)’ implemented by the NGO Món-3 and the Orientale Region and funded by the City of Barcelona, this diagnostic report provides useful insights on water governance in Morocco, as well as the challenges that local authorities, such as the Municipality of Oujda, face with regard to water management. Relations between different public stakeholders at the local level are discussed in the document which highlights the lack of coordination between them and the limited powers of the municipality. A number of interesting recommendations are issued by the authors of the report in this regard. It is interesting to note that the city of Oujda has wagered on the reuse of treated wastewater as an alternative to scarce conventional water resources in its region, both for municipal use and irrigation.

Themes: Water Resources Management
Geographical Scope: Mediterranean Region

Gehem, Maarten; van Duijune, Freija; Ilko, Ihor ; Mukena, Jacques; Castellon, Nicolas. [*Mapping agribusiness opportunities in the MENA. Exploring favorable conditions and challenges for agribusiness in the Middle East and North Africa.*](#) The Hague Centre for Strategic Studies, 2015.

The report presents an overall picture of the agribusiness sector in the MENA region (and three detailed case studies including ones on Egypt and Morocco) focusing on current driving factors, favourable conditions and challenges that could hinder its growth potential. Although the study elaborates mainly on business, not policy-oriented ideas with regards to agribusiness opportunities, multiple favourable conditions identified by the authors may also be of relevance for LRAs. For example, in the case of Morocco, the Green Morocco Plan could be beneficial for LRAs willing to pursue more sustainable agriculture techniques or simply improve the productivity of the sector thanks to cooperation with business partners. i.e. on technology transfer.

Themes: Development of Agroecology and New Eco-Innovative Agricultural Techniques, Support for Food Security and Sovereignty

Geographical Scope: MENA Region, with specific case studies on Egypt and Morocco (and Saudi Arabia)

Lacirignola, Cosimo. [*Terre et mer: ressources vitales pour la Méditerranée.*](#) Paris: L'Harmattan, 2015.

This book is a compilation of 15 articles published in the CIHEAM Watch Letter in 2015. It provides interesting insights on innovative policies to protect natural resources for agriculture and fisheries. The book gives both regional and local perspectives, thus highlighting concrete examples and innovative and best practices on the ground. The loss of arable lands in the Mediterranean through the concrete example of Lebanon, the fights against food wastage in Spain and Morocco, and the management of natural resources in the Maghreb oasis are among the issues addressed by the articles written through local lenses. Finally, the chapter on the 'Super potagers' project in Algeria provides a good example of a multi-stakeholder partnership between international NGOs, multinational private companies and a municipality in the Ouargla wilaya to develop local agriculture in the desert without wasting natural resources, while contributing to fighting hunger.

Themes: Agriculture, Agricultural Soil Management, Water Resources Management, Food Security

Geographical Scope: Mediterranean Region

Moatti, Jean-Paul; Thiébaud, Stéphane. *[The Mediterranean region under climate change: A scientific update](#)*. Marseille: IRD Éditions, 2016.

This book provides a comprehensive review of the mechanisms, trends and projections of climate change in the Mediterranean, its impact on natural resources with an emphasis on water and soil, and finally adaptation and resilience strategies for agricultural management, food security and the prevention of land degradation. The detailed diagnosis of the impact of climate change in the region is put in perspective with possible solutions and good practices already in place at the regional and local levels.

Themes: Agricultural Soil Management and Water Resources Management
Geographical Scope: Mediterranean Region

Nin Pratt, Alejandro; El-Enbavy, Hoda; Figueroa, Jose Luis; ElDidi, Hagar; Breisinger, Clemens. *[Agriculture and economic transformation in the Middle East and North Africa: A review of the past with lessons for the future](#)*. International Food Policy Research Institute (IFPRI) and Food and Agriculture Organization (FAO), 2018.

This paper prepared by the International Food Policy Research Institute (IFPRI) and the FAO provides a complex diagnosis of the state of agriculture in the MENA region as well as more detailed case studies on Egypt and Tunisia, in which multiple regional disparities are elaborated on. It seems that, especially in Egypt, these local differences in approaches to agriculture (traditional agri-oriented Upper Egypt versus Lower Egypt where the focus is predominately on agro-processing) are significant. Nevertheless, the authors claim that, among others, despite its small nominal contribution to the economy, agriculture is an integral part of sustainable growth. As a region that is already exposed to the serious impacts of climate change and food and water scarcity, it urgently needs radical transformation. Apart from listing technical drivers and constraints that block stakeholders from more efficient and eco-friendly agro-production, the report includes a set of practical recommendations on the socio-economic transformation needed in parallel to the agrarian reforms.

Themes: Management of Agricultural Soils, Water Resources Management, Development of Agroecology and New Eco-Innovative Agricultural Techniques, Support for Food Security and Sovereignty
Geographical Scope: MENA Region

Tal, Alon. *[Israeli Agricultural Innovation: Assessing the Potential to Assist Smallholders](#)*. Tel Aviv University and Syngenta Foundation for Sustainable Agriculture, Working Paper, 2019.

The paper focuses on unique Israeli innovations in agriculture, food production and water treatment that could be applicable for small-scale farmers in other regions with similarly adverse geological conditions, including Africa and Asia. The author provides a detailed description of the innovations, tools and products used in the country while distinguishing a couple that are at least partially related to LRAs. Apart from a network of eight regional research and development (R&D) centres aimed at helping small-scale farmers, a network of 150 agricultural experts travelling from one municipality to another and supporting those in need as well as agro-tech incubators are mentioned.

Themes: Management of Agricultural Soils, Water Resources Management, Development of Agroecology and New Eco-Innovative Agricultural Techniques, Support for Food Security and Sovereignty

Geographical Scope: Israel

Annex 1 References

Ariyama, Jiro; Batchelor, Charles; El Mahdi, Amgad; Wahaj, Robina; Vallee, Domitille. *Count and Account Water for Agricultural Sustainability and Sustainable Development the NENA Region*. 3rd World Irrigation Forum, 2019. Available at: https://www.icid.org/wif3_bali_2019/wif3_1-3_15-min.pdf

Bessaoud, Omar; Pellissier, Jean-Paul; Rolland, Jean-Pierre; Khechimi, Wided. *Rapport de synthèse sur l'agriculture en Algérie*. CIHEAM-IAMM, 2019. Available at: <https://hal.archives-ouvertes.fr/hal-02137632/document>

CIHEAM and FAO. *Mediterra 2016. Zéro gaspillage en Méditerranée. Ressources naturelles, alimentations et connaissances*. Paris: Presses de Sciences Po, 2016.

Chebbi, Housssem Eddine; Pellissier, Jean-Paul; Rolland, Jean-Pierre; Khechimi, Wided. *Rapport de synthèse sur l'agriculture en Tunisie*. CIHEAM-IAMM, 2019. Available at: <https://hal.archives-ouvertes.fr/hal-02137636/document>

Deboos, Arthur. *Réutilisation des eaux usées traitées en Méditerranée et impacts sur les territoires*. IPAMED, Palimpsestes n°19, 2018. Available at: http://www.ipemed.coop/adminIpemed/media/fich_article/1521027092_palimpsestes-n19-fr.pdf

De Franchis, Laura. *Threats to Soils in Mediterranean Countries*. Plan Bleu Papers, Valbonne: Plan Bleu Regional Activity Centre, UNEP/MAP, 2003. Available at: http://planbleu.org/sites/default/files/publications/cahiers2_sols_us.pdf

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). *Sustain Water MED 2016: Integrated Wastewater Management in the Mediterranean – Good practices in decentralised and centralised reuse-oriented approaches*. SWIM-Sustain Water MED Project, GIZ, 2016. Available at: <https://www.adelphi.de/en/publication/integrated-waste-water-management-mediterranean>

Dias Pereira, Luis; Santos, Nuno. *Morocco: Investing in collective action: opportunities in agrifood cooperatives*. FAO Investment Centre, Country Highlights, 2018. Available at: <http://www.fao.org/3/CA1198EN/ca1198en.pdf>

El Hajj, Rana; Farajalla, Nadim; Terpstra, Tessa; Jagerskog, Andres. *Enhancing regional cooperation in the Middle East and North Africa through the Water-Energy-Food Security Nexus*. Clingendael Policy Brief, 2017. Available at: https://www.planetarysecurityinitiative.org/sites/default/files/2017-06/PB_PSI_MENA.pdf

El-Sayed, Abdel-Fattah. *Regional Review on Status and Trends in Aquaculture Development in the Near East and North Africa – 2015*. FAO Fisheries and Aquaculture Circular, No. 1135/6, FAO Publications, Rome, 2017. Available at: <http://www.fao.org/3/a-i6876e.pdf>

Euro-Mediterranean Regional and Local Assembly (ARLEM). *ARLEM report on local water management in the Mediterranean*. Second plenary session, Agadir, 2011. Available at: <http://www.upm-eau.net/local/arlem/en.pdf/download>

Fader, Marianela; Shi, Sinan; Von Bloh, Werner; Bondeau, Alberte. *Mediterranean irrigation under climate change: more efficient irrigation needed*. Hydrology and Earth System Sciences, 20, 953–973, 2016. Available at: <https://www.hydrol-earth-syst-sci.net/20/953/2016/hess-20-953-2016.pdf>

FAO and Global Soil Partnership (GSP). *Regional Implementation Plan of the NENA Soil Partnership: towards sustainable management of soil resources*. Rome: FAO, 2015. Available at: <http://www.fao.org/3/a-bc536e.pdf>

FAO and Intergovernmental Technical Panel on Soils (ITPS). *Status of the World's Soil Resources (SWSR) – Chapter 13: Regional Assessment of Soil Changes in the Near East and North Africa*. Rome: FAO, 2015a. Available at: <http://www.fao.org/3/a-bc602e.pdf>

FAO. *AQUASTAT Profil de Pays – Algérie*. Rome: FAO, 2015b. Available at: <http://www.fao.org/3/i9861fr/I9861FR.pdf>

FAO. *AQUASTAT Profil de Pays – Maroc*. Rome: FAO, 2015c. Available at: <http://www.fao.org/3/ca0203fr/CA0203FR.pdf>

FAO. *AQUASTAT Profil de Pays – Tunisie*. Rome: FAO, 2015d. Available at: <http://www.fao.org/3/ca0212fr/CA0212FR.pdf>

FAO. *AQUASTAT Country Profile – Libya*. Rome: FAO, 2016a. Available at: <http://www.fao.org/3/i9803en/I9803EN.pdf>

FAO. *AQUASTAT Country Profile – Egypt*. Rome: FAO, 2016b. Available at: <http://www.fao.org/3/i9729en/I9729EN.pdf>

FAO. *Évaluation de l'approvisionnement alimentaire dans un contexte de pénurie d'eau. Tunisie.* Rome: FAO, 2018a. Available at: <http://www.fao.org/3/ca0867fr/CA0867FR.pdf>

FAO. *Water Management in Fragile Systems: Building Resilience to Shocks and Protracted Crises in the Middle East and North Africa.* FAO Discussion Paper, 2018b. Available at: <http://www.fao.org/3/I9730EN/i9730en.pdf>

FAO. *Near East and North Africa Regional Synthesis for The State of the World's Biodiversity for Food and Agriculture.* Rome: FAO, Commission on Genetic Resources for Food and Agriculture, Regional Synthesis Reports, 2019a. Available at: <http://www.fao.org/3/ca6146en/ca6146en.pdf>

FAO. *Rural transformation-key for sustainable development in the near east and North Africa. Overview of Food Security and Nutrition 2018,* 2019b. Available at: <http://www.fao.org/3/ca3817en/ca3817en.pdf>

FAO. *The 10 Elements of agroecology: guiding the transition to sustainable food and agricultural systems.* Rome: FAO, 2019c. Available at: <http://www.fao.org/3/i9037en/i9037en.pdf>

Fundación Món-3. *Diagnostic de l'état, utilisation et gestion de l'eau dans la ville d'Oujda.* Barcelona, 2016. Available at: <https://mon-3.org/wp-content/uploads/2019/09/Diagnostic-de-etat-utilisation-et-gestion-de-eau-dans-la-ville-Oujda.pdf>

Garcia Garcia, Elen; Lorenzo, Celia Murcia ; Silvi, Mariateresa. *Education for Sustainable Consumption, Behaviour and Lifestyles. A Collection of Case Studies.* Barcelona: UfM, 2019. Available at: https://ufmsecretariat.org/wp-content/uploads/2019/11/UfM_PUBLICATION_EducationSCBL.pdf

Gehem, Maarten; van Duijune, Freija; Ilko, Ihor ; Mukena, Jacques; Castellon, Nicolas. *Mapping agribusiness opportunities in the MENA. Exploring favorable conditions and challenges for agribusiness in the Middle East and North Africa.* The Hague Centre for Strategic Studies, 2015. Available at: https://hcss.nl/sites/default/files/files/reports/HCSS_Mapping_The_MENA.pdf

Golzarand, Mahdieh; Mirmiran, Parvin; Jessri, Mahra; Toolabi, Karamollah; Mojarrad, Mehdi; Azizi, Fereidoun. *Dietary trends in the Middle East and North Africa: an ecological study (1961 to 2007).* Public Health Nutrition 15(10), 2013. Available at: <https://www.cambridge.org/core/journals/public-health-nutrition/article/dietary-trends-in-the-middle-east-and-north-africa-an-ecological-study-1961-to-2007/9C2D0A1B9F8F6F3EE190A052777FD64F>

Gordillo, Gustavo. *Food Security and Sovereignty (Base document for discussion)*. FAO, 2013. Available at: <http://www.fao.org/3/a-ax736e.pdf>

Hamdy, Atef. *Water Governance in the Mediterranean*. In *IEMed Mediterranean Yearbook 2012*, Barcelona: IEMed, 2012. Available at: https://www.iemed.org/observatori-en/arees-danalisi/arxius-adjunts/anuari/med.2012/hamdy_en.pdf

Harbouze, Rachid; Pellissier, Jean-Paul; Rolland, Jean-Pierre; Khechimi, Wided. *Rapport de synthèse sur l'agriculture au Maroc*. CIHEAM-IAMM, 2019. Available at: <https://hal.archives-ouvertes.fr/hal-02137637/document>

International Union for Conservation of Nature. *North Africa Programme 2017-2020*, 2016. Available at: https://www.iucn.org/sites/dev/files/content/documents/north_africa_programme_2017-2010_en.pdf

Jamali, Dima; Lanteri, Alessandro. *Social Entrepreneurship in the Middle East*. New York, NY: Palgrave MacMillan, 2015.

Keulertz, Martin. *Water and Food Security Strategies in the MENA Region*. MENARA Future Notes No. 18, 2019. Available at: http://www.menaraproject.eu/wp-content/uploads/2019/03/menara_fn_18.pdf

Lacirignola, Cosimo. *Terre et mer: ressources vitales pour la Méditerranée*. Paris: L'Harmattan, 2015. Available at: https://www.ciheam.org/uploads/attachments/45/CIHEAM_-_Terre_et_mer_Ressources_vitales_en_Mediterranee_-_2015.pdf

Lacirignola, Cosimo; Lamaddalena, Nicola; Khadra, Roula. *Water Scarcity and Security in the Mediterranean*. In *Water around the Mediterranean*, UfM-Revolve Report, UfM-Revolve Report, Chapter 1, 2017. Available at: <https://ufmsecretariat.org/wp-content/uploads/2018/01/water-report-2017.pdf>

Mahdhi, Naceur; Sghaier, Mongi; Fouzai, Ayoub; Kadri, Nesrine. *Eau et changement climatique : quelles stratégies d'adaptation pour la gestion de l'eau d'irrigation dans le sud-est Tunisien*. *New Medit*, 18, 15-28, 2019. Available at: https://newmedit.iamb.it/bup/wp-content/uploads/2019/04/nm1901b_Mahdhi.pdf

Marzin, Jacques; Bonnet, Pascal; Bessaoud, Omar; Ton-Nu, Christine. *Study on small-scale family farming in the Near East and North Africa region. Synthesis*. FAO, CIHEAM_IAMM, and CIRAD, 2017. Available at: <http://www.fao.org/3/b-i6436e.pdf>

Mediterranean Experts on Climate and Environmental Change (MedECC). *Risks Associated to Climate and Environmental Changes in the Mediterranean Region: A Preliminary Assessment by the MedECC Network Science-Policy Interface - 2019*. MedECC, 2019. Available at: http://www.medecc.org/wp-content/uploads/2018/12/MedECC-Booklet_EN_WEB.pdf

Methods for Irrigation and Agriculture (MIRRA). *Ultra-Low Energy Drip Irrigation for MENA Countries. Year 1 End Report. Aug. 2016 –Sep. 2017*. 2017. Available at: <http://mirra-jo.org/Photos/Files/2c0aad9-52c3-43ae-9ae3-320c707be2cf.pdf>

Moatti, Jean-Paul; Thiébault, Stéphane. *The Mediterranean region under climate change: A scientific update*. Marseille: IRD Éditions, 2016. Available at: <https://books.openedition.org/irdeditions/22908>

Mozas, Morgan; Ghosn, Alexis. *État des lieux du secteur de l'eau en Algérie*. IPEMED, 2013. Available at: http://www.ipemed.coop/adminIpemed/media/fich_article/1384435889_Etat%20des%20lieux%20du%20secteur%20de%20l'eau%20en%20Alg%C3%A9rie_oct2013.pdf

Najjar, Dina; Badstue, Lone. *Four Ways of Strengthening Gender Equality in the Agricultural Sector in the MENA Region*. International Maize and Wheat Improvement Center, 2020. Available at: <https://www.cimmyt.org/news/four-ways-of-strengthening-gender-equality-in-the-agricultural-sector-in-the-mena-region/>

Nin Pratt, Alejandro; El-Enbawy, Hoda; Figueroa, Jose Luis; ElDidi, Hagar; Breisinger, Clemens. *Agriculture and economic transformation in the Middle East and North Africa: A review of the past with lessons for the future*. International Food Policy Research Institute (IFPRI) and Food and Agriculture Organization (FAO), 2018. Available at: <https://www.ifpri.org/publication/agriculture-and-economic-transformation-middle-east-and-north-africa-review-past-lessons>

OECD–FAO. *OECD-FAO Agricultural outlook 2018-2027*. OECD Publishing/FAO, 2018. Available at: <http://www.fao.org/publications/oecd-fao-agricultural-outlook/2018-2027/en/>

Omidvar, Nasrin; Ahmadi, Davod; Sinclair, Kate; Melgar-Quiñonez, Hugo. *Food security in selected Middle East and North Africa (MENA) countries: an inter-country comparison*. Food Security: The Science, Sociology and Economics of Food Production and Access to Food, vol. 11, issue 3, No 5, 2019. Available at: https://ideas.repec.org/a/spr/ssefpa/v11y2019i3d10.1007_s12571-019-00935-w.html

Raclot, Damien; Le Bissonnais, Yves; Annabi, Mohamed; Sabir, Mohamed. *Challenges for Mitigating Mediterranean Soil Erosion Under Global Change*. In: Moatti, Jean-Paul; Stéphane Thiébaud. *The Mediterranean region under climate change: A scientific update*. Marseille: IRD Éditions, sub-chapter 2.3.3, 2016. Available at: <https://books.openedition.org/irdeditions/23538?lang=fr>

Rome Declaration on World Food Security. World Food Summit, 1996. Available at: <http://www.fao.org/3/w3613e/w3613e00.htm>

Santos, Nuno; Hess, Sebastian; Jamali Jaghdani, Tinoush. *Turkey: Water along the food chain*. FAO Investment Centre, Country Highlights, 2016. Available at: <http://www.fao.org/3/a-i5991e.pdf>

Tal, Alon. *Israeli Agricultural Innovation: Assessing the Potential to Assist Smallholders*. Tel Aviv University and Syngenta Foundation for Sustainable Agriculture, Working Paper, 2019. Available at: <https://www.syngentafoundation.org/file/14266/download>

Tawk, Salwa Tohmé; Moussa, Ziad; Hamadeh, Shadi. *Mainstreaming Urban Agriculture in the Middle East and North Africa: a multi-stakeholder approach*. 2014. Available at: http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2014/WS_2_8_Tawk.pdf

Union for the Mediterranean. *Key players' perspective on climate change in the Mediterranean*. Barcelona: UfM, 2016. Available at : https://ufmsecretariat.org/wp-content/uploads/2016/11/UfM_SectoralReport_2016_EN_web1.pdf

Union for the Mediterranean & Institut Méditerranéen de l'Eau. *Regional Report. Mediterranean Regional Process Commission*. 8th World Water Forum, 2018. Available at: <https://ime-eau.org/?wpdmact=process&did=NjcuaG90bGluaw>

United Nations Environment Programme/Mediterranean Action Plan (UNEP/MAP). *Mediterranean Strategy for Sustainable Development 2016-2025: Investing in environmental sustainability to achieve social and economic development*. Valbonne: Plan Bleu Regional Activity Centre, 2016. Available at:

https://www.planbleu.org/sites/default/files/publications/mssd_2016-2025_final.pdf

USAID and Ministry of Water and Irrigation of the Hashemite Kingdom of Jordan. *Office Buildings Water Efficiency Guide*. USAID/Jordan Monitoring and Evaluation Support Program (MESP), 2011. Available at: <https://jordankmportal.com/resources/download?id=office-buildings-water-efficiency-guide-english>

Woertz, Eckart; Soler; Eduard; Farres, Oriol; Busquets, Anna. *The Impact of Food Price Volatility and Food Inflation on Southern and Eastern Mediterranean Countries*. CIDOB, UfM, 2014. Available at: <https://ufmsecretariat.org/wp-content/uploads/2015/04/CIDOB-Study-The-Impact-of-Food-Price-Volatility-FINAL.pdf>

Zdruli, Pandi; Ziadat, Feras; Nerilli, Enrico; D’Agsotino, Daniela; Lahmer, Fadila; Bunning, Sally. *Developpement Durable des Sols*. In CIHEAM & FAO. *Mediterra 2016. Zéro gaspillage en Méditerranée. Ressources naturelles, alimentations et connaissances*. Paris: Presses de Sciences Po, 2016. Available at: https://www.ciheam.org/uploads/attachments/334/Mediterra2016_FR_BAT.pdf

Websites

American University of Beirut. *Beirut – terrestrial biodiversity*. Available at: https://www.aub.edu.lb/ifi/Documents/publications/docs/beirut_zone/20180921_beirut_zone_10_location_map_5.pdf (access: June 15, 2020)

EcoPeace Middle East. *Community involvement*. Available at: <https://ecopeaceme.org/projects/community-involvement/> (access: June 7, 2020)

Facebook Page of the Marsadev Project Egypt, Available at: <https://www.facebook.com/Marsadev-project-Egypt-784471981631262/> (access: June 22, 2020)

FAO. *Aquastat Main Database*, Available at: <http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en> (access: June 15, 2020)

FAO. *Food Security Statistics*. Available at: <http://www.fao.org/economic/ess/ess-fs/en> (access: June 7, 2020)

FAO. *Sustainable land management*. Available at: <http://www.fao.org/land-water/land/sustainable-land-management/en/> (access: June 8, 2020)

FAO. *What is food loss and food waste?* Available at: <http://www.fao.org/food-loss-and-food-waste/en/> (access: June 8, 2020)

FAO Regional Office for Near East and North Africa. *FAO calls for the adoption of 'biodiversity-friendly' practices in agriculture*. Available at: <http://www.fao.org/neareast/news/view/en/c/1244948/> (access: June 8, 2020)

FAO Regional Office for Near East and North Africa. *Tackling food loss and waste in the Near East and North Africa*. Available at: <http://www.fao.org/neareast/perspectives/food-waste/en/> (access: June 8, 2020)

FERT. *Animation RCM network and capacity building of farmer groups for adaptation to climate change and promoting conservation agriculture in large Mediterranean cultures*. Available at: <https://www.fert.fr/en/animation-du-reseau-rcm-et-renforcement-des-capacites-des-groupes-dagriculteurs-pour-ladaptation-au-changement-climatique-et-la-promotion-de-lagriculture-de-conservation-en/> (access: June 22, 2020)

Le Groupement de Développement Agricole (GDA) Sidi Amor, Available at: <https://www.sidiamor.org/gda1/> (access: June 15, 2020).

Sustainable Development Goals. *SDG good practices*. Available at: <https://sustainabledevelopment.un.org/partnerships/goodpractices> (access: June 15, 2020)

UN. *Sustainable farming in Turkey bears fruit for everyone*. Available at: <https://www.un.org/development/desa/en/news/sustainable/sustainable-farming-bears-fruit.html> (access: June 15, 2020)

United Nations Convention to Combat Desertification (UNCCD). *Sustainable land management (SLM)*. Available at: <https://knowledge.unccd.int/topics/sustainable-land-management-slm> (access: June 15, 2020)

Annex 2 Other funding possibilities (not directly available to LRAs) and relevant ongoing projects³¹

Name of the funding scheme: [Conservation, Food and Health Foundation — Local Project Support](#)

Funding body: The Conservation, Food and Health Foundation

Theme: Conservation, food, and health

Geographical scope: Asia, Africa, Latin America and the Middle East

Description and other relevant info: The foundation is funding projects focusing on conservation, agricultural and health sciences. While LRAs are not eligible to apply for funding, grants (on average USD 20,000) are provided for local NGOs, civil society and community-based organisations.

Name of the funding scheme: n/a

Funding body: [The Green Climate Fund \(GCF\)](#)

Theme: Climate mitigation and climate adaptation as well as cross-cutting projects (mostly those related to agriculture)

Geographical scope: Least Developed Countries (LDCs), Small Island Developing States (SIDS) and African States

Description and other relevant info: Cross-cutting projects are aimed at supporting climate-smart investments in agriculture as well as the transition to sustainable and climate-resilient economies. For example, non-EU ARLEM countries, particularly Morocco, are benefiting from funds for irrigation developments. Previously, LRAs have benefited from indirect funding throughout the project implementation.

Name of the funding scheme: [Sustainable Cities Project 2 \(+ Sustainable Cities Project 2 Additional Funding\)](#)

Funding body: The World Bank (International Bank for Reconstruction and Development)

Theme: Water, wastewater and solid waste management

Geographic scope: Turkey

Description and other relevant info: The project provides financial assistance to selected municipalities (e.g. Antalya and Mugla) to improve municipal infrastructure investments in, among others, improving water and wastewater,

³¹ The descriptions of the funding schemes may be directly quoted from the original sources indicated in the links.

reducing greenhouse gas emissions and promoting the sustainable and environmental management of solid waste. The overarching goal of the project is to increase the sustainability of Turkish municipalities and improve their resilience to increasing climate and disaster risks. About 34% of total funding under the main Sustainable Cities Project 2 (USD 92 million) and 100% of Additional Funding (USD 561 million) are dedicated to LRAs. Thus, LRAs could benefit from financial support throughout the project implementation period (until May 2026).

Name of the funding scheme: [IFC's Priorities in Agribusiness](#)

Funding body: International Finance Corporation (IFC)

Theme: Management of agricultural soils, water resources management, development of agroecology and support for food security and sovereignty

Geographical scope: Developing countries

Description and other relevant info: Different types of support, including technical and financial assistance.

Name of the funding scheme: n/a

Funding body: [International Fund for Agricultural Development \(IFAD\)](#)

Theme: Management of agricultural soils, water resources management, development of agroecology and support for food security and sovereignty

Geographical scope: Developing Member States of IFAD

Description and other relevant info: The IFAD collaborates with governments, agencies and NGOs to help LRAs and local organisations implement projects that cover local food security and value chains, and rural transformation, as well as the management of land and water resources. Through previous projects, LRAs have benefited from indirect funding and integrated rural development projects.

Name of the funding scheme: EU Instrument for Pre-Accession Assistance (IPA) / EU pre-accession assistance for rural development (IPARD)

Funding Body: European Union (DG NEAR)

Theme: Regional development (providing support to transport, environment infrastructure and enhancing competitiveness and reducing regional disparities) / IPARD: Rural Development (2014-2020)

Geographical scope: Turkey

Description and other relevant info: Under IPARD, the EU provides Turkey with financial and technical support to make its agricultural sector and rural areas more sustainable and align them with the EU's common agricultural policy. Measure 4 of IPARD in Turkey is specifically related to the agri-environment, climate and organic farming (pilot on soil erosion). The first priority of the IPA Environment

Operational Programme in Turkey aims at improving the water supply, sewerage and wastewater treatment services and has contributed to support the construction and modernisation of wastewater treatment plants and water conveyance systems in several municipalities. Turkey has been allocated EUR 3.5 million under IPA II (2014-2020). If LRAs (municipalities) can be important beneficiaries of the IPA, the scheme is implemented by Turkish governmental authorities.

Annex 3 Funding possibilities/solutions and recommendations matrix

Table A1. Funding possibilities/solutions and recommendations matrix part 1	PRIMA	H2020	ENI	ENI CBC MED	Sea-Crossing Italy-Tunisia Programme	FEMIP	EBRD Loans	French Facility for Global Environment (FFEM)	Canada Fund for Local Initiatives
General governance and institutional obstacles and solutions									
Adopt a long-term, integrated vision of the management of natural resources									
LRAs have a major role to play through awareness raising campaigns									
LRAs could support the establishment of regional platforms									
Participatory approaches, as a pillar of the sustainable management of natural resources, need to be adopted by LRAs through the establishment of direct dialogues with local communities of farmers									
Management of agricultural soils									
Promotion and adoption of conservation agriculture									
Preventing the loss of arable lands to urbanisation and even reclaiming space for agriculture									
Management of water resources									
Reducing water wastage and improving water efficiency									
Investments to modernise water conveyance infrastructures and provide maintenance									
Increasing water efficiency in public buildings									
Water efficiency of irrigated agriculture at the parcel level									
Mobilisation of non-conventional water resources									
Wastewater treatment reuse									
Development of agroecology and new eco-innovative agricultural techniques									
Introduction, coordination and knowledge exchange on local/regional biodiversity plans or strategies									
Organisation of local training/workshop sessions for farmers and cooperative members									
Creation of a city/local budget-backed incubator for agroecology ideas									
Creation of practical guidelines preserving the local gastronomic heritage									
Support for food security and sovereignty									
Reducing the vulnerability of small-scale farmers to climate shocks									
Co-creation of policies for urban agriculture should take place in a participatory and multi-stakeholder manner									
Creation of education schemes for the youngest									

Table A2. Funding possibilities/solutions and recommendations matrix part 2	InsuResilience Solutions Fund	Green Cities Facility	Conservation, Food and Health Foundation — Local Project	The Green Climate Fund (GCF)	Sustainable Cities Project 2 (+Additional Funding)	IFC's Priorities in Agribusiness	International Fund for Agricultural Development
General governance and institutional obstacles and solutions							
Adopt a long-term, integrated vision of the management of natural resources							
LRA's have a major role to play through awareness raising campaigns							
LRA's could support the establishment of regional platforms							
Participatory approaches, as a pillar of the sustainable management of natural resources, need to be adopted by LRAs through establishment of direct dialogues with local farmers' communities							
Management of agricultural soils							
Promotion and adoption of conservation agriculture							
Preventing the loss of arable lands to urbanisation and even reclaiming space for agriculture							
Management of water resources							
Reducing water wastage and improving water efficiency							
Investments to modernise water conveyance infrastructures and provide maintenance							
Increasing water efficiency in public buildings							
Water efficiency of irrigated agriculture at the parcel level							
Mobilisation of non-conventional water resources							
Wastewater treatment reuse							
Development of agroecology and new eco-innovative agricultural techniques							
Introduction, coordination and knowledge exchange on local/regional biodiversity plans							
Organisation of local training/workshop sessions for farmers and cooperative members							
Creation of a city/local budget-backed incubator for agroecology ideas							
Creation of practical guidelines preserving the local gastronomic heritage							
Support for food security and sovereignty							
Reducing the vulnerability of small-scale farmers to climate shocks							
Co-creation of policies for urban agriculture should take place in a participatory and multi-stakeholder manner							
Creation of education schemes for the youngest							

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