### United Nations Decade of Family Farming Regional Action Plan for the Near East and North Africa

### About this online consultation

This document summarizes the online consultation *United Nations Decade of Family Farming Regional Action Plan for the Near East and North Africa* held on the FAO Global Forum on Food Security and Nutrition (FSN Forum) from 21 July to 31 August 2020. The consultation was facilitated by FAO’s Regional Initiative on Small-Scale Family Farming Team from the FAO Regional Office for the Near East and North Africa.

This online consultation invited participants to share experiences and input to contribute to the development of the United Nations Decade of Family Farming (UNDFF) Regional Action Plan for the Near East and North Africa (NENA) region. It focused on the following topics: 1) the impact of the COVID-19 outbreak in the NENA region; 2) sustainable transition towards more sustainable agri-food systems; 3) inclusive and equitable growth; 4) an enabling environment for the implementation of the UNDFF, and 5) partnerships.

Over the six weeks of discussion, participants from 26 countries shared 59 contributions. The topic introduction and the consultation questions proposed, as well as the contributions received, are available on the consultation page:

<http://www.fao.org/fsnforum/activities/discussions/UNDFF_NENA>

### 1. The impact of the COVID-19 outbreak in the NENA region

***The impact of COVID-19 on the challenges faced by small-scale family farmers***

Participants agreed that in general, COVID-19 has aggravated the challenges faced by the region’s family farmers. The containment measures, including lockdowns, border closures and movement restrictions, have disrupted agricultural activities in different ways. Regarding production and harvesting, multiple contributors highlighted the difficulties in accessing labour and agricultural inputs, with shortages and price increases of the latter leaving farmers unable to prepare their fields. Furthermore, farmers experienced difficulties in exporting and marketing their products due to closure of local markets (multiple contributors), suspension of public food procurement, and a drop in demand from hotels, restaurants and catering services (Sylvie Guillaud, Mona Siblini). In addition, at the level of the individual consumer, decreasing demand could be witnessed due to fear of visiting markets (Reda Rizk, Vethaiya Balasubramanian), shifting preferences from fresh food to preserved food (International Center for Biosaline Agriculture, Mona Siblini) and decreasing purchasing power. A lack of adequate storage facilities has also led farmers to lose (part of) their produce (multiple contributors).

The above dynamics have negatively impacted the prices of agricultural commodities, leading to income losses for smallholders (Adel Zekaizak, Reda Rizk, Heidi Samir Sadek). Consequently, farmers were sometimes obligated to sell assets or to borrow money (Adel Zekaizak). In this context, it is important to consider that the pandemic has hampered the provision of effective government support to farmers. Physical distancing has made face-to-face meetings difficult, and farmers are not always familiar with ICTs that could provide alternative ways to communicate (Fatima Messelmani, Heidi Samir Sadek, Haitham Hamdan). In addition, public and private agencies may have weak institutional and financial capabilities for using modern technology to communicate with those most in need of support (Heidi Samir Sadek, Haitham Hamdan).

However, the pandemic has also had positive consequences. For instance, it has highlighted the importance of the agricultural sector (Haitham Hamdan). In addition, a rising interest in leading a healthy life by eating plenty of fruit and vegetables can be witnessed. Furthermore, there is increased attention for hygienic practices in food value chains (Haitham Hamdan, Heidi Samir Sadek). Other positive impacts for farmers include: 1) decreasing pollution rates, which can improve plant growth; 2) development of skills to cope with crises (Heidi Samir Sadek), and 3) endeavors to ensure self-sufficiency (Heidi Samir Sadek, Ali Jaafar, Haitham Hamdan).

Participants also described the impact of COVID-19 on farmers in their respective countries:

* In **Algeria**, during confinement, the Government authorized farmers, breeders and suppliers of agricultural equipment and inputs to continue their usual activities while taking into account health recommendations. Therefore, food products continued to be available and COVID-19 did not significantly affect agriculture (Mohamed Khiati).
* In **Egypt**, where COVID-19 had already reduced agricultural income, inadequate information about differences in precautionary measures among Arab countries surprised Egyptian exporters, leading to additional costs and higher losses. In general, the demand for crops decreased substantially, with potatoes and fruit – except for oranges – being particularly affected (Akram El Khergawy). In addition, artichoke farmers suffered from a fall in demand due to market disruptions in Italy and Spain, leading them to sell their harvests at a loss. Some farmers tried to switch to other crops, but many were bound by contracts with traders (Clemens Breisinger). Furthermore, livestock farmers faced increasing production costs due to rising input prices, while at the same time, lower demand for their products led them to sell their products at reduced prices (Abdel Kader Omar El Shafie). A complicating factor was the curfew, which interrupted milking schedules and caused farmers to lose more than a quarter of their output. Some of them also incurred extra costs for sanitizing their barns. Others complained about the unavailability of veterinary services (Clemens Breisinger).
* In **Morocco**, the Government has set up a monitoring unit, which brings together national and regional stakeholders that monitor the agricultural situation and ensure a regular supply of agricultural products to the national market. However, the rate of flow of agricultural products is not the same as before due to the fact that labourers work only half a day and transporters sometimes find it difficult to obtain a traffic permit. This also causes an increase in labour and transport costs (Mohamed Bouaam).
* In **Palestine**, farmers have faced numerous problems, including: 1) border closures that hamper exports; 2) very low prices for their produce (Alaa Jayab, Amin Abu-Alsoud); 3) lack of access to inputs (Alaa Jayab), for instance due to conversion of conventional payment methods to cash payments only (Amin Abu-Alsoud); 4) closure of markets; 5) decreasing demand due to declining purchasing power and shifting consumer preferences (Rulla Sarras, Amin Abu-Alsoud), and 6) absence of adequate storage facilities (Amin Abu-Alsoud). Eventually, many crops were destroyed as they could not be marketed, forcing farmers, such as cut flower and poultry producers, to halt their activities (Alaa Jayab, Amin Abu-Alsoud). However, the pandemic’s impact will be particularly severe for women’s livelihoods, which mainly depend on the informal economy and the agribusiness sector (Amin Abu-Alsoud).
* In **Tunisia**, the dairy sector has been confronted with production flow problems and a decrease in the sales of products such as yoghurt and cheese, while there was also an oversupply of fresh milk due to the sudden increase in the demand for UHT milk (Riadh Louhichi). Furthermore, in general, female farmers have been affected by the pandemic due to: 1) disruption in the implementation of programmes targeting women, such as a social protection programme and the country’s action plan for women’s empowerment; 2) difficulties in marketing fresh products and products from small livestock; 3) mobility issues that hamper the supply of inputs and the establishment of crops, and 4) difficulties in obtaining the hygiene and quality certificates needed for marketing products via e-commerce (Ministry of Agriculture of Tunisia).
* In **Yemen**, COVID-19 has adversely affected family farmers by limiting the availability of seasonal agricultural workers (Ashraf Alhawamdeh) and damaging harvests (Mohamed Sallam Kolaib). The pandemic has led to declines in household income (Mohamed Sallam Kolaib, Ashraf Alhawamdeh), exacerbating already severe food insecurity (Ashraf Alhawamdeh). In fact, although food is available, it is increasingly becoming inaccessible to vulnerable households, as prices are soaring (Mohamed Sallam Kolaib).

***Main areas of intervention to build family farmers’ resilience and to ensure sustainable livelihoods***

Participants shared specific suggestions on priority actions to enhance farmers’ resilience and promote sustainable livelihoods in the context of the COVID-19 pandemic. They believed there is a need to:

* strengthen existing food security and agriculture monitoring, assessment and coordination mechanisms for evidence-based programming (Mohamed Sallam Kolaib);
* support livelihood diversification and homestead food production (Mahtab S. Bamji) to increase local food availability and income generation opportunities (multiple contributors);
* provide food and financial aid (Vethaiya Balasubramanian) to boost incomes of vulnerable households in order to stabilize access to food (Mohamed Sallam Kolaib, Ashraf Alhawamdeh);
* scale up communication and awareness raising efforts regarding COVID-19 prevention measures to support adequate functioning of the food value chain (Mohamed Sallam Kolaib, Riadh Louhichi);
* adapt capacity building activities for farmers in accordance with safety measures, enhancing the use of ICT (Mohamed Sallam Kolaib);
* establish coordination mechanisms between local authorities and farmers, so the former can act as intermediary between sellers and buyers to ensure that fresh products reach the consumer, while respecting safety measures (International Center for Biosaline Agriculture, Rulla Sarras);
* encourage farmers to use locally available resources to produce inputs such as compost to reduce dependency on imports;
* guarantee timely access to agricultural inputs at reasonable prices, liquidity, and technical and market information (multiple contributors);
* enhance smallholders’ digital literacy to help solve constraints (in terms of marketing, inputs, and information) in times of crises (Amin Abu-Alsoud), and
* improve food storage (Steve Hoda) and processing facilities (Vethaiya Balasubramanian, Mona Siblini) in areas that are easily accessible to family farmers (International Center for Biosaline Agriculture).

Furthermore, contributors shared suggestions on actions to strengthen farmers’ livelihoods and resilience in general. Overall, it was stressed that farmers should be involved in relevant decision-making processes (Alaa Jayab), and that policies should be adaptable to local contexts (Abbas Khaled). In addition, participants stressed the need to:

* guarantee land tenure security (Malika Bounfour);
* promote mechanization of agricultural operations (Steve Hoda, Dick Tinsley, S. Justice);
* encourage sustainable agricultural production, such as organic farming (Dhruv Sanandan Bhardwaj, Haitham Hamdan) and permaculture (Brandon Eisler);
* provide technologies for irrigation suited to local contexts (Malika Bounfour);
* enhance farmers’ access to financial services (Vethaiya Balasubramanian, Mohamed El-Medany), such as mobile payment services (Amin Abu-Alsoud);
* provide conditional financial support (Mohamed El-Medany) and small grants (Reda Rizk);
* strengthen agricultural extension services, capacity building and training;
* support participation in and establishment of farmers’ cooperatives for group procurement of inputs and selling of produce (multiple contributors);
* sustain good seed sources at affordable prices and host seed storage facilities or platforms of exchange (Khaled Abulaila);
* engage farmers in value-added activities (International Center for Biosaline Agriculture, Adel Zekaizak, Haitham Hamdan);
* enhance market access (Steve Hoda, Amin Abu-Alsoud) by: 1) improving markets at the district and governorate level, connecting them to the internet and guaranteeing daily publication of prices of agricultural products (Adel Zekaizak); 2) establishing fairs (Khaled Abulaila); 3) promoting e-commerce (multiple contributors), and 4) building local marketing networks (Reda Rizk, Haitham Hamdan, Fatima Messelmani);
* support rural women in establishing small livelihood projects;
* encourage rural youth to establish small and medium enterprises;
* assist rural women and farmers in creating local NGOs or cooperatives that serve smallholders, and provide support to already existing organizations (Adel Zekaizak);
* boost digital transformation (Haitham Hamdan) and disseminate digital applications that improve outreach, production and marketing (Adel Zekaizak, Tharaka Jayasinghe), and
* provide farmers with in-kind assistance, including basic equipment and inputs (Ali Jaafar, Fatima Messelmani).

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| **Box 1. Strengthening the resilience of urban farming systems through community involvement** COVID-19 has demonstrated the urgency of strengthening the resilience of urban family farming systems. Designing adequate interventions requires involving farmers in policy-making processes – this applies especially to female farmers, who play a central role in the sector. The experience of the Gaza Urban & Peri-urban Agriculture Platform has demonstrated the importance of community engagement in policymaking for achieving positive change in the context of local agricultural development. Supporting the establishment of specialized agricultural forums that facilitate processes to influence policies and exchange knowledge at different levels is crucial for strengthening the UNDFF’s Regional Action Plan, and for building balanced and fair partnerships (Ahmed Sourani). |

***Success examples in the region***

Participants shared several examples of initiatives that support family farmers, their resilience and sustainable livelihoods – some of them implemented in the context of COVID-19:

*Egypt*

Contributors discussed various initiatives. First, the Fayoum Agro Organic Development Association has provided rural families with pregnant buffalos and technical support in livestock breeding. Eventually, these families have merged their individual enterprises into a single enterprise, and a unit has been set up to collect and process milk, which has improved family income (Mohamed El-Medany). Second, the Road to Development Association has set up field schools to train farmers on composting. Furthermore, in collaboration with the Coptic Evangelical Authority, the Association has provided agricultural inputs at reduced prices (Heidi Samir Sadek). Third, a discussion participant from Egypt shared information on projects he contributed to, which include activities focusing on: 1) development of irrigation systems; 2) establishment of collection and processing centers for perishable agricultural produce, and 3) introduction of small animal production enterprises and demonstration farms for animal breeders (Abdel Monim Sedki).

*Lebanon*

In Lebanon, the Government has supported poultry farmers and sheep and cow breeders by supplying feed at reduced prices (Fatima Messelmani).

*Morocco*

Solidarity markets established by the Mohamed VI Foundation for Solidarity as well as weekly organic markets organized by the RIAM network have supported small-scale family farmers (El Hassane Bourarach). Furthermore, the provision of a temporary basic income for vulnerable family farmers has helped those in mountainous areas to buy food and medication during the lockdown (Malika Bounfour).

*Palestine*

The Government has implemented several actions to support family farming in the context of COVID-19. In collaboration with local NGOs, it has launched a home gardening initiative, which entailed the distribution of vegetable seedlings to 16 000 beneficiaries. Another example is the “Solve It” initiative, implemented together with UNDP, which targets youth and focuses on innovation for sustainable social impact in the agri-food value chain. Furthermore, the Farmers’ Market Initiative gives local farmers a cheap platform to market their products directly to urban consumers (Amin Abu-Alsoud). Farmers themselves have also taken initiative by starting to sell their produce via social media (Amin Abu-Alsoud, Rulla Sarras). Last, beekeepers in the north of Palestine have managed to market their produce through “express delivery companies”, which were able to move between cities and villages during the pandemic (Rulla Sarras).

*Yemen*

FAO has implemented nutrition-sensitive interventions in order to reduce dependency on food assistance and imports, and to help households in producing food and generating income. The project provided seeds, water tanks and drip irrigation networks, as well as training that focused, *inter alia*, on nutrition. Vegetable yields have increased, allowing for improvements in household nutrition. Another FAO project focused on improving the small-scale dairy value chain and on empowering women in the dairy sector. It has included various activities, such as those focusing on improvement and distribution of animal feed, vaccination and de-worming campaigns, distribution of improved dairy equipment, and establishment of dairy processing units. Milk production and animal weight have increased, and women are now able to manage their own processing units and to market their produce (Mohamed Sallam Kolaib).

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| **Box 2. Digital apps for farmers in the context of COVID-19** In the NENA region, the following mobile apps have supported farmers under COVID-19 restrictions:* The FAO El-Mufeed app in Egypt and the app of Morshidak Al-Zerai in the Kingdom of Saudi Arabia that provide farmers with advisory services;
* The Bashaier app which links buyers with sellers in Egypt;
* FAMEWS, an FAO mobile application for real-time monitoring of the fall armyworm;
* The IPhyto Pro app in Morocco that supports agricultural professionals and extension agents in getting the information they need to assist farmers;
* The Moroccan Bee Agri app, a network for farmers that allows them to discuss technical issues and to receive contextualized information from peers and technical advisors (Adel Zekaizak).
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| **Box 3. Multi-country projects to promote family farmers’ resilience**FAO implemented the “Climate Change and Adaptation Solutions for the Green Sectors of Selected Zones in the NENA Region” project, focusing on Egypt, Jordan and Lebanon. The project used state-of-the art climate change projections and AquaCrop, FAO’s model for crop yield response to water and climate change, to assess changes in yield of key crops under various climate scenarios. The aim of the initiative was to inform strategic thinking about adaptation to climate change and water scarcity (Santosh Kumar Mishra). The Japan International Cooperation Agency has implemented the “Smallholder Horticulture Empowerment and Promotion” approach in Egypt and Palestine. The objective has been to support farmers in conducting market surveys; based on the results of these surveys, farmers develop cropping calendars. This has boosted their autonomy: by actively exploring information on markets and agricultural inputs, farmers can better cope with challenges by being able to adjust their farming activities on their own (Jiro Aikawa). |

### 2. Sustainable transition towards more sustainable agri-food systems

***Key climate change impact factors on productivity of the region’s farming systems***

Climate change has complex effects on agriculture in the NENA region (Mona Siblini), which has been confronted with changes in temperature ranges and precipitation, and extreme weather events such as floods and heat waves (Steve Hoda, Mohamed El-Medany, Fatima Messelmani). Related to this, changes in flowering and fruit setting dates can be witnessed, as well as a higher incidence of pests and diseases (Mohamed El-Medany, Fatima Messelmani, Mokhles Boukdall), which significantly affect crop productivity (Akram El Khergawy).

However, the region is particularly vulnerable to droughts (Fatima Messelmani, Mona Siblini), a problem that is expected to increase, and which will particularly affect rainfed agriculture. For agro-pastoralists, droughts result in a lack of grazing resources and losses in herds, while cereal and fruit tree growers will be affected by a reduction in yields or even complete crop failure. These consequences can be felt in subsequent years, and eventually, drought may lead to rural out-migration if capital gets depleted or lost (International Center for Biosaline Agriculture).

Another contributor discussed the specific impact of heat stress on livestock, which would lead to a reduction in productivity, as animals would eat less and direct their energy to alleviating this stress. Furthermore, heat stress would affect animal reproductive health: it would reduce the quality of semen, while in females it would shorten the duration of the heat period, thus reducing the number of seasons of dairy livestock or the number of births (Abdel Monim Sedki).

Increased salinity in the NENA region is another (indirect) impact of climate change when caused by inappropriate irrigation practices that result in waterlogging, as well as by seawater intrusion into coastal farming areas due to a combination of rising sea levels and over-pumping. Higher salinity results in declining agricultural productivity, and mitigation and prevention are therefore crucial for promoting the region’s agricultural development (International Center for Biosaline Agriculture).

Some participants also discussed the impact of climate change on agriculture in their respective countries:

* In **Egypt**, farmers have already experienced adverse effects of climate change. This year, frost and cold waves led to lower wheat productivity and to an increased incidence of several fungal diseases. Furthermore, high temperatures caused an increase in pests and diseases, which negatively impacted tomato production. In the future, Egyptian agriculture is also expected to suffer from climate change in terms of decreased rainfall and crop productivity, and soil salinization. However, while research foresees (further) decreases in wheat, maize, rice and tomato productivity, cotton productivity would be positively affected (Akram El Khergawy).
* In **Iraq**, climate change is expected to lead to more frequent heat waves, fewer frost days, and a decrease in mean annual average rainfall. Combined with anthropogenic activities such as upstream riparian development of the Tigris and Euphrates, the availability of surface and groundwater will decrease, placing more pressure on groundwater systems with implications for water quality and quantity. Both irrigated and rainfed farming systems will need to adopt water-saving techniques (Sarah Barnhart).
* In **Jordan**, impact is mainly related to a lack of water and, for rainfed agriculture, the distribution of precipitation. However, heat and dust waves have also adversely impacted agricultural produce, for instance by increasing pest infections (Khaled Abulaila).
* In **Morocco**, water resources have decreased from 2 500 m3 in 1960 to 650 m3/inhabitant/year currently. In the next 25 years, climate change could lead 80 percent of the available water resources to disappear. Impacts of climate change would be many, including: 1) decreased quantity and quality of agricultural production; 2) desertification of oasis ecosystems; 3) soil and rangeland degradation, and 4) changing species interactions (Mohamed Bouaam).
* In **Palestine**, climate change has negatively impacted crop productivity and diversification. Drought has led many farmers to shift to the cultivation of less water-intensive crops: farmers in the Jordan Valley who used to produce citrus fruits and bananas are now planting palm trees, which gives rise to the emergence of monocultures (Rulla Sarras).

 ***Innovation and digital solutions to accelerate a transition towards more sustainable agri-food systems***

Multiple contributors stressed that innovation and digital solutions can contribute to a transition towards more sustainable agri-food systems by facilitating assessments of the impacts of climate change and projections of future climate trends. In this way, agricultural projects can be kept up to date (Mohamed El-Medany) and farmers can be provided with crucial early warning and weather information (multiple contributors).

Participants also discussed other advantages of innovation and digital solutions, highlighting, however, that the latter should not be considered “silver bullets” (Marco Brini). Economic benefits include increased agricultural productivity, profitability, and business opportunities (Justin Langtar, Fatima Messelmani). Innovation and digital solutions can also promote social inclusion and lead to a more rational use of resources and inputs (Justin Langtar, Abdel Monim Sedki). In addition, they can promote farmers’ access to inputs, finance, training and markets (multiple contributors).

For the NENA region, innovations to promote adequate water management are particularly important, examples being efficient irrigation technologies, adequate rainwater collection structures (multiple contributors), and unconventional water technologies and resources, including seawater desalination and usage of treated wastewater (Mohamed Bouaam). Other useful innovations would include: 1) best practices that improve the productivity of existing cropping systems; 2) crops with high tolerance to drought and salinity, and with high nutritional and economic value, and 3) soil and water management practices that improve fertility and mitigate or prevent salinization (International Center for Biosaline Agriculture). Another contributor suggested specific focus areas for livestock – in this regard, innovation and digitalization should be concerned with: 1) increasing the efficiency of feed and the use of enzymes to aid digestion; 2) improving ventilation inside stables to provide a comfortable climate for livestock; 3) providing diets with balanced components and mineral elements to reduce heat stress, and 4) reducing greenhouse gas emissions from livestock through conversion of gases into a non-gaseous form (Abdel Monim Sedki).

Furthermore, comments included ideas regarding the adoption of specific digital tools:

* **Laboratory Information Systems** allow food supply chain stakeholders to comply with regulations and operate efficiently, as they bring people, instruments and workflows into a single integrated system, simplifying and automating processes (Santosh Kumar Mishra);
* **The Internet of Things** can provide (near) real-time information on micro-environmental conditions, for instance through weather stations and *in situ* sensors;
* **Satellites** can provide (near) real-time climate data along with historical localized climate data;
* **Cloud analytics and Big Data** can leverage existing agronomic algorithms with real-time local data, assessing risk for farmers and insurances, supporting the supply chain, and increasing price efficiency (Marco Brini);
* **Mobile phones** facilitate low-cost communication to reach farmers with information and recommendations (Rulla Sarras, Marco Brini), and to enable exchange of experience among farmers (Rulla Sarras).

One of the contributors also discussed how these different technologies could be applied. First, “top-down” agronomic recommendations – matching global and local climate data with agronomic algorithms – could support farmers in crop selection and management. Second, digitalization can improve “two-way harvest profitability”: crops can be selected, sown and harvested according to analytics based on market demand along with supply chain capacity. Artificial Intelligence and Big Data could support real-time adjustments. Third, digital, low-cost and highly adaptable (weather index) micro insurances could protect smallholders, which would reduce the need for public subsidies in the long term (Marco Brini).

However, with specific regard to digitalization, an enabling environment needs to be in place (Sarah Barnhart), and family farmers would need to be trained on the use of ICT (Steve Hoda). Furthermore, interventions should not increase rural-urban and gender divides. In fact, to fully realize digitalization’s potential benefits, a holistic and systems approach should be adopted (International Center for Biosaline Agriculture, Justin Langtar).

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| **Box 4. The International Center for Biosaline Agriculture, GIS and remote sensing technologies** The International Center for Biosaline Agriculture has used GIS and remote sensing technologies to monitor evapotranspiration, drought, vegetative productivity, and other key indexes to better understand how environmental resources are utilized. In addition, these technologies have allowed the Center to flag critical changes that could indicate losses in productivity and changes to geoclimatic settings in key areas. The Center also uses drones to conduct small-scale high-resolution mapping of agricultural activities on individual farms. Its scientists aim to explore the possibility of seeding, pollination, and farming using automated drone systems (International Center for Biosaline Agriculture). |

***The UNDFF: tools and measures to help family farmers face climate change and socio-economic challenges***

Overall, contributors stressed that interventions developed in relation to the UNDFF should be context-specific and recognize the diversity of family farmers (Ashraf Alhawamdeh, Sylvie Guillaud). The process should be bottom-up and inclusive (Ashraf Alhawamdeh, Mohamed Sallam Kolaib) and characterized by multi-stakeholder engagement (Sylvie Guillaud). In the context of the UNDFF, governments should be assisted in enhancing institutional changes, laws, policies and strategies to support family farmers (Khaled Abulaila, Mona Siblini). These political efforts should consider the recent developments related to the COVID-19 pandemic (Santosh Kumar Mishra, Sylvie Guillaud), which should specifically be reflected in the UNDFF National Action Plans (Sylvie Guillaud).

Furthermore, advocacy for effective drought policies and plans should receive particular attention. Given the region’s substantial experience in this field, sharing of knowledge and experiences should be facilitated in the context of the UNDFF (International Center for Biosaline Agriculture). In general, technology transfer trips could be organized (Mohamed El-Medany) and “success stories” identified and disseminated (El Hassane Bourarach). Providing direct financial and technical support (Mohamed El-Medany), training (Rulla Sarras) and support in accessing markets (Mohamed Sallam Kolaib) would be other ways to support family farmers. Furthermore, farmers’ organizations may be aided by efforts to strengthen their capacities (Khaled Abulaila, Mohamed Sallam Kolaib, Fatima Messelmani).

Participants also discussed very specific issues that deserve particular attention in the context of the UNDFF, including: 1) the use of native seeds (Ministry of Agriculture of Tunisia) and traditional seed systems (Mohamed Sallam Kolaib); 2) photovoltaics; 3) rainwater recovery in elevated cisterns (Ministry of Agriculture of Tunisia); 4) construction of greenhouses; 5) production of dwarf animal breeds and crop varieties; 5) fine-tuning of sowing strategies (Abdel Monim Sedki); 6) diversification of crops and crop varieties; 7) development of climate-smart varieties and breeds (Abdel Monim Sedki, Mohamed Sallam Kolaib, Mokhles Boukdall); 8) reduction in greenhouse gas emissions from livestock; 9) production of crops with lower sugar content to prevent spoilage (Abdel Monim Sedki); 10) improvement of irrigation methods (Mokhles Boukdall), and 11) adoption of conservation agriculture (Mohamed Sallam Kolaib).

Furthermore, the need to assist other actors was mentioned: 1) youth and women should be supported by enhancing their engagement in agriculture, while promoting gender equality (Rulla Sarras, Fatima Messelmani); 2) specialized actors from the public and private sector should be supported in order to ensure that technology and innovation are beneficial to family farmers, and 3) community-based organizations and NGOs should be supported in putting pressure on decision-makers to create an enabling policy environment for smallholder in terms of laws, taxes, and insurances (Rulla Sarras).

Last, the establishment of sound agricultural information systems to support evidence-based interventions would be crucial, as well as an enhanced understanding of farmers’ cultivation strategies. Value chain development would also be of key importance. In particular, one should promote a better understanding of the root causes of the problems related to value chain practices, and of how value chain activities and stakeholders are linked to each other and to their economic, social and natural contexts (Mohamed Sallam Kolaib).

### 3. Towards inclusive and equitable growth

***Strategies and instruments to ensure adequate access to services, resources and social protection for vulnerable groups***

Overall, there is a need to advocate for the acknowledgement of the key role of family farmers in sustainable development in national strategies, and, in particular, in social protection programmes – this advocacy could only be carried out by efficient farmers’ organizations (Mona Siblini). In addition, it is crucial to guarantee equal access to information for marginalized and vulnerable people in order to ensure access to services, resources and social protection (Sarah Barnhart). Moreover, in particular social protection programmes should consider the specific needs of different vulnerable groups (Santosh Kumar Mishra, Sarah Barnhart). FAO’s Resilience Index Measurement and Analysis (RIMA) tool has been used successfully in carrying out needs assessments and deciding on targeting strategies of interventions (Leonidas Hitimana).

Participants also discussed examples of social protection programmes that reach particularly vulnerable people:

* **Cash for Work programmes.** These may be adapted to ensure that women and the elderly, but also vulnerable groups such as disabled individuals, can participate equitably. FAO Iraq, for example, ensured that vulnerable women could partake in a Cash for Work scheme by introducing a nursery rehabilitation activity (Sarah Barnhart).
* **Conditional cash transfer programmes.** An IFPRI impact evaluation of the national conditional cash transfer programme “Takaful and Karam” in Egypt found that beneficiaries used the cash received to improve household nutrition, and that spending on schooling and transportation for their children increased. However, no evidence was found of an increase in women’s bargaining power within the household, even though transfers were directed to women.
* **Cash Plus programmes.** An IFPRI impact evaluation of the Cash Plus intervention “Cash for Nutrition” in Yemen found that cash transfers combined with nutrition education had significant positive impacts on maternal and child dietary diversity, child weight-for-height, and child height-for-age. The greatest impacts tended to be among households belonging to the poorest tercile. The programme featured a soft conditionality in which attending nutritional training sessions was mandatory, although there was no penalty for absence (Clemens Breisinger).

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| **Box 5. The Arab Authority for Agricultural Investment and Development and its revolving loan programmes for women**With the aim to promote women’s social and economic empowerment and to improve living conditions in rural areas, the Arab Authority for Agricultural Investment and Development (AAAID) has facilitated women’s access to simple soft loans. Specifically, AAAID has been involved in financing rural women's food production enterprises, which has strengthened women's independence. During the period 2013-2019, the programme has reached 3 412 beneficiaries, who have demonstrated commitment to work and repay their loans (Mohamed Abdeltawwab Mohamed). |

***Priority actions to promote decent employment and to eliminate child labour in family farming***

One of the participants stressed that decent work cannot be decreed from above and that first, a broader enabling environment needs to be created (El Hassane Bourarach). In fact, multiple participants referred to the need to focus on more general interventions, including those concerning the provision of (communication) infrastructure, agricultural extension, financial services and support, and access to markets.

Other participants highlighted that schools for rural women should be established to train them in social skills, communication and marketing (Reda Rizk, Fatima Messelmani). Schools for children, on the other hand, should be made more accessible and attractive, and it would be crucial to make parents understand that education is a lever for getting out of poverty (El Hassane Bourarach). Capacity development opportunities should also be provided to young people (Fatima Messelmani), while farmers should receive training on agricultural entrepreneurship and professionalization of their activities (Steve Hoda).

Furthermore, solutions were suggested to specifically reduce children’s exposure to hazards and to diminish the need for their engagement in agricultural production. First, promoting sustainable farming practices, such as integrated pest management, could reduce child labour by decreasing labour requirements, reducing pesticide use and improving farmers’ incomes. The physical vulnerabilities of children are crucial to consider in this context: their bodies and minds are still developing and strenuous tasks and exposure to chemicals have detrimental impacts on their health (Ariane Genthon). Second, labour-saving practices and mechanization (Malike Bounfour, Ariane Genthon) could help reduce the need for workforce and increase production, and therefore reduce the amount of work undertaken by children. Combining approaches, while also raising awareness about the dangers of child labour (Mokhles Boukdall, Ariane Genthon) can promote agricultural productivity and create opportunities to move up the value chain or diversify income generating activities (Ariane Genthon).

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| **Box 6. Promoting inclusive and equitable growth: initiatives in Morocco and Tunisia**In Morocco, the Green Generation Strategy aims to create a new generation of young agricultural entrepreneurs. In this context, collective land will be distributed and agricultural training provided to 150 000 young people. Another initiative, implemented by FAO, concerns the establishment of indicators for the monitoring and evaluation of the evolution of family farming and the effect of public policies on the social and economic inclusion of the sector (Mohamed Bouaam).In Tunisia, Law 51 on “the transport of agricultural workers”, published in 2019, allows young people to obtain authorizations for the acquisition of transport means on favourable terms to facilitate transport for female agricultural workers. Furthermore, the Government envisages the creation of sale points for agricultural products to promote the marketing of women’s products in rural areas; young people will be recruited to manage these structures. Last, the country implements an action plan for social and economic empowerment of female farmers, which focuses on training as well as the organization of women farmers in Agricultural Development Groups and mutual agricultural service companies (Ministry of Agriculture of Tunisia). |

### 4. Enabling environment for the implementation of the UNDFF

***Stakeholders’ roles in implementing the UNDFF in the NENA region***

Participants discussed the roles stakeholders should play in the context of the UNDFF, arguing that in general, they should:

* implement comprehensive and coherent policies, investments and institutional frameworks that support family farming at the local, national and international level;
* promote inclusive and effective governance mechanisms and timely and geographically relevant data for well-targeted policy design and implementation;
* guarantee sustained political commitment and the provision of adequate resources by state and non-state actors;
* establish and strengthen local, national and international cooperation in support of family farming (Ashraf Alhawamdeh);
* invest in R&D in the agricultural sector and in extension services;
* promote Public-Private Partnerships (PPPs) (El Hassane Bourarach);
* produce knowledge that contributes to the promotion of sustainable family farming (International Center for Biosaline Agriculture), and
* strengthen cooperation among different local development organizations and between development organizations and government agencies (Halkawt Mohammad).

Furthermore, a participant pointed out that development agencies, farmers’ organizations and civil society organizations should:

* encourage governments to involve farmers’ organizations in decision-making processes;
* set up programmes geared towards the empowerment of women and the elimination of discrimination in accessing land and other resources, including knowledge;
* facilitate women’s participation in rural labour markets;
* invest in technologies and infrastructure that reduce workloads and boost production;
* promote comprehensive agricultural advisory services;
* exchange knowledge of innovative technologies and practices at different levels;
* contribute to finding alternative sources for agricultural financing;
* adopt clear policies in the field of agricultural education, and
* support the formation and institutionalization of agricultural cooperatives to facilitate their access to funding (Mohamed Abdeltawwab Mohamed).

Other participants discussed the role of single stakeholders:

*Governments*

While some participants argued that governments should only have a supervisory role (Reda Rizk, Fatima Messelmani), others stressed that they have a central role as they are the implementers of the UNDFF (Sylvie Guillaud). In fact, they are crucial actors due to their institutional and regulatory power (Malika Bounfour, Steve Hoda), which enables them to provide funding and implement reforms (Malika Bounfour). Specifically, governments should:

* reform legal frameworks and policies, helping farmers to gain access to profitable markets;
* urge (agricultural) banks to provide timely services that meet farmers’ needs;
* provide agricultural extension services;
* organize small farms into associations to facilitate cooperation and provide them with services;
* develop (communication) infrastructure in rural areas;
* promote sustainable agricultural production methods characterized by low water consumption, such as hydroponics and organic farming, and conduct research on crops tolerant to salinity;
* facilitate farmers’ access to basic social and economic services and promote diversification of production to address their vulnerability;
* expand and diversify economic opportunities for farmers for them to obtain adequate returns on their investments;
* provide institutional guarantees to facilitate financing by international financing institutions, and support financing institutions in providing soft loans to farmers;
* support young farmers to adopt social innovations that contribute to sustainable food systems;
* promote gender equality and social inclusion to ensure long-term sustainability of family farming;
* support farmers’ organizations in developing their capacities to adequately represent farmers (Mohamed Abdeltawwab Mohamed), and
* improve agricultural data collection, eventually with the help of development organizations or universities (Sumanth Chinthala).

*Development agencies*

A contributor argued that development organizations should catalyze and enable change by providing funding and support in policy formulation. In addition, they should contribute to enhancing multilateral policy dialogue and cooperation, as well as knowledge sharing (Malika Bounfour). However, other participants stressed that rather than providing support to governments, development organizations should directly target farmers (Reda Rizk, Fatima Messelmani).

*Farmers’ organizations*

Farmers’ organizations are the main beneficiaries of the UNDFF and are transmitters and preservers of traditional knowledge and culture (Malika Bounfour). They should internalize the importance of supporting youth in order to ensure generational sustainability of family farming, while promoting gender equity and women’s leadership (International Center for Biosaline Agriculture).

*Civil society*

Civil society organizations should be involved in all aspects of the UNDFF, including the development of National Action Plans, and the implementation and monitoring of actions (Sylvie Guillaud). Furthermore, civil society organizations usually have social power and can help build public support. They may be beneficiaries of funds or provide funds, and can help build capacities (Malika Bounfour) by providing training and extension (Reda Rizk, Fatima Messelmani).

*Private sector*

The private sector markets and exports products (Reda Rizk, Fatima Messelmani) and possesses financial means: therefore, it may facilitate change by providing relevant services and investments (Malika Bounfour). In fact, the private sector will have a key role in ensuring socio-economic inclusiveness in family farming (International Center for Biosaline Agriculture). Specifically, the private sector should:

* implement microfinance programmes for smallholders (Malika Bounfour, Mohamed Abdeltawwab Mohamed);
* facilitate famers’ access to markets, for instance by buying their products directly, without involvement of intermediaries;
* contribute to the provision of modern agricultural technologies and irrigation systems;
* conduct practical training programmes at production sites and provide extension services;
* urge companies to provide advice and assistance to smallholders;
* establish factories for processing agricultural products and facilitate smallholders’ access to these processing plants (Mohamed Abdeltawwab Mohamed), and
* help establish small-scale technologies and industries for the agricultural sector (Sumanth Chinthala).

*UN organizations*

FAO and IFAD lead the implementation of the UNDFF (Santosh Kumar Mishra) and have a key role in encouraging governments to use the UNDFF to capitalize on family farming and its capacity to sustainably feed countries and create employment. Appropriation of the UNDFF by states is imperative to ensure its correct implementation. In this process, FAO and IFAD can facilitate dialogue between governments and civil society (Sylvie Guillaud).

***Addressing bottlenecks to the successful implementation of the UNDFF in the NENA region***

Participants mentioned bottlenecks that could hamper the implementation of the UNDFF, pointing to political differences (Mokhles Boukdall), inadequate policies, legal frameworks (Mona Siblini) and human resources (Ministry of Agriculture of Tunisia), and a lack of active family farmers’ organizations (Mona Siblini).

Some participants discussed specific barriers to the implementation of the UNDFF as well as ways to overcome them:

* **A lack of multi-stakeholder dialogue.** Consultation frameworks should be boosted (Steve Hoda) or a coordination committee consisting of representatives of at least FAO, IFAD and civil society, should be set up (Sylvie Guillaud).
* **Poor governance within producer groups.** Responsible actors should be trained in leadership (Steve Hoda).
* **A lack of financial resources** (Ministry of Agriculture of Tunisia, Mona Siblini). Stakeholders should join efforts to increase awareness of the UNDFF and organize related fundraising activities (International Center for Biosaline Agriculture), while countries should be assisted in setting up agricultural development banks (Steve Hoda).
* **A lack of access to high-quality data.** Access to high quality data is critical for evidence-based policy. Ministries should share collected data with each other, and a culture of transparency regarding government data should be built. This would enable researchers to provide independent analyses and evaluations of the effectiveness of policies (Clemens Breisinger).
* **Work overload of local government representatives.** To avoid difficulties in having these actors participate in key meetings and activities, planning these events well in advance could help (International Center for Biosaline Agriculture).
* **Unfavourable conditions for digitalization.** In some countries, policies, socio-economic conditions and institutional frameworks do not support digitalization; addressing this requires setting up online public administration services, especially in the areas of agriculture, health, education, environment and employment (Justin Langtar).
* **Lack of coordination between stakeholders.** A committee for each region could coordinate development projects for family farming and act as the liaison between farmers, the government, and donor agencies (Reda Rizk, Fatima Messelmani).

### 5. Partnerships

***Building and establishing innovative partnerships***

One of the participants stressed that partnerships can help overcome many challenges faced by farmers, and therefore contribute to improved food security (Mohamed Abdeltawwab Mohamed). However, another contributor argued that the impact of partnerships on food security and food markets is unclear; therefore, there is a need for knowledge development and sharing on: 1) the different types of impact partnerships can have; 2) how to shift from delivering outcomes to achieving real impact; 3) combining bottom-up and top-down approaches, and 4) effective partnership management (Santosh Kumar Mishra).

In any case, prior to the UNDFF’s implementation, an environment of collaboration needs to be established, which requires defining all relevant institutions to be involved (Mona Siblini). Stronger partnerships between these different institutions could lead to a shift from sectoral policies to comprehensive, holistic, context-specific approaches that adequately support family farmers and their multi-dimensional nature (Ashraf Alhawamdeh, Charles Ssekyewa, Lal Manavado). Furthermore, creating more openness would contribute to effective interventions (El Hassane Bourarach).

Participants suggested a wide range of issues on which partnerships should focus, ranging from financial and technical support to farmers (Mohamed Abdeltawwab Mohamed, Heidi Samir Sadek) to the promotion of social and financial inclusion of women, youth, and people with disabilities (Justin Langtar, Heidi Samir Sadek), and the establishment of food processing industries (Charles Ssekyewa).

Furthermore, participants discussed different partnership types to be established, including those between: 1) NGOs and relevant government departments (Heidi Samir Sadek); 2) startups and farmers; 3) the private sector and agricultural universities, and 4) public and private actors, i.e. PPPs, which should be characterized by strong inclusiveness (Steve Hoda, Charles Ssekyewa). Scaling up PPPs requires involvement of multi-stakeholder platforms, which are essential to successfully engage stakeholders and facilitate creative dialogue, and to provide technical support to facilitate nascent partnerships (Ashraf Alhawamdeh).

Last, one of the participants stressed the need to conclude partnerships with: 1) software agencies to improve data collection and analysis; 2) local universities to train local people on agricultural technologies for improved production, and 3) training institutes and individual researchers that can help build capacities of “agricultural changemakers”, who can, in turn, contribute to scaling up training facilities in their countries (Sumanth Chinthala).

***Existing partnership initiatives to replicate or scale up***

Participants discussed the following initiatives to be considered for replication or upscaling:

* The **Arab Women Leaders in Agriculture** (AWLA) is a fellowship programme launched by the International Center for Biosaline Agriculture in collaboration with the Islamic Development Bank, the Bill & Melinda Gates Foundation and the CGIAR Research Program on Wheat. It supports Arab women researchers by allowing them to exchange ideas and good practices on the difference women can make in agriculture. The initiative has been successful in facilitating cooperation between people from different backgrounds (International Center for Biosaline Agriculture).
* The **Agroecology in Practice project**, funded by the Swedish Development Agency, was implemented in Uganda (Uganda Martyrs University), Ethiopia (Mekelle University) and Sweden (University of Applied Sciences). The project aimed to enhance farmers’ understanding of their farm and the surrounding environment, adopting a systems perspective. Understanding the complexity of this system, farmers started to acknowledge the necessity of engaging in partnerships if they wanted their business to be sustainable. Eventually, this has promoted sustainable land use and management (Charles Ssekyewa).
* The **Sawlog Production Grant Scheme** in Uganda has been successful due to: 1) the modality of co-investment with retrospective disbursement of grants, which ensures establishment of quality forest plantations and rules out the risk of money being used for other purposes; 2) extensive training on standards and guidelines to establish commercial forest plantations, and 3) the integrated approach which promotes related investments along the value chain (Leonidas Hitimana).
* The **Revolving loan programme** implemented by the Arab Authority for Agricultural Investment & Development (AAAID) is a notable example of the wide range of successful programmes for family farmers AAAID has implemented. It concerns the mobilization of financial resources for smallholders through partnerships with local banks and regional financing institutions (Mohamed Abdeltawwab Mohamed).

### Resources shared by participants

**Aid & International Development Forum.** n.d. *Operational feasibility of smallholder innovations: an administrative void in development* [online]. Fort Collins, USA. [Cited 15 June 2020]. https://webdoc.agsci.colostate.edu/smallholderagriculture/ OperationalFeasibility.pdf

**Arab Women Leaders in Agriculture.** n.d. *Arab Women Leaders in Agriculture* [online]. Dubai, United Arab Emirates. [Cited 31 August 2020]. www.awlafellowships.org/

**Biggs, S. & Justice, S.** 2015. *Rural and agricultural mechanization: a history of the spread of small engines in selected Asian countries*. IFPRI Discussion Paper 01443. Washington, DC. (also available at https://csisa.org/wp-content/uploads/sites/2/2014/06/BiggsJusticeIFPRI\_DP\_01443.pdf).

**Chourghal, N. & Hartani, T.** 2020. Quelle stratégie de semis du blé dur en Algérie pour s’ adapter au changement climatique? *Cahiers Agricultures*, 29 [online]. [Cited 31 August 2020].

https://doi.org/10.1051/cagri/2020017

**Chourghal, N. & Huard, F.** 2020. Stratégies d’adaptations de la culture du blé dur face aux changements climatiques futurs en Algérie: 1-Gestion des semis. *Bari-Chania-Montpellier-Zaragoza*. Options Méditerranéennes, A 124, 2020 – Research and innovation as tools for sustainable agriculture, food and nutrition security. MEDFORUM 2018. Bari, Italy, September 18-20 2018. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/Options%20M%C3%A9diterran%C3%A9ennes2020.pdf

**Chourghal, N., Lhomme, J.P., Huard, F. & Aidaoui, A.** 2016. Climate change in Algeria and its impact on durum wheat. *Regional Environmental Change*, 16(6): 1623-1634.

**Colorado State University.** 2008. *Calorie energy balance: risk averse or hunger & exhaustion* [online]. Fort Collins, USA. [Cited 31 August 2020]. https://smallholderagriculture.agsci.colostate.edu/calorie-energy-balance-risk-averse-or-hunger-exhasution/

**Colorado State University.** 2018. *Promoting the Green Revolution in Asia as solely technology driven: a major disservice to Africa* [online]. Fort Collins, USA. [Cited 31 August 2020]. https://smallholderagriculture.agsci.colostate.edu/promoting-the-green-revolution-in-asia-as-solely-technology-driven-a-major-disservice-to-africa/%C2%A0

**El-Hagarey, M.** n.d. *Saving of irrigation water using innovative follicular drippers irrigation system* [online]. [Cited 31 August]. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/Research\_1.docx

**El-Hagarey, M.** 2014. Design and manufacture of pottery dripper for the use of saline water in irrigation systems. *IOSR Journal of Agriculture and Veterinary Science*, 7(5): 70-80.

**El-Hagarey, M., El-Sabbagh, B.A., & Safranyik, F.** 2018. Mathematical model of engineering and hydraulic design factors of innovative pressure compensating pottery dripper. European *Journal of Academic Essays,* 2(9): 61-71.

**FAO.** 2018. *Resilience Analysis in Karamoja. FAO Resilience Analysis Report No. 10.* Rome, Italy. 72 pp. (also available at www.fao.org/3/i8365en/I8365EN.pdf).

**FAO.** 2019. Climate change and adaptation solutions for green sectors in the NENA Region. In: *Casos de éxito* [online]. Rome. [Cited 31 August 2020]. www.fao.org/partnerships/stories/story/es/c/1180588/

**FAO.** 2020. *COVID-19 and its impact on food security in the Near East and North Africa: How to respond?* Cairo, Egypt. 32 pp. (also available at www.fao.org/3/ca8778en/CA8778EN.pdf).

**FAO.** 2020. *FAO framework on ending child labour in agriculture.* Rome, Italy. 148 pp. (also available at www.fao.org/3/ca9502en/CA9502EN.pdf).

**FAO.** 2020. FAO recommendations on planting and harvesting tasks during the COVID-19 outbreak using crop calendars. In: *Crop calendars and COVID-19* [online]. Rome. [Cited 31 August 2020]. www.fao.org/2019-ncov/covid-19-crop-calendars/en/

**FAO.** 2020. Resilience Index Measurement and Analysis (RIMA). In: *Resilience - Background* [online]. Rome. [Cited 31 August 2020]. www.fao.org/resilience/background/tools/rima/en/

**FHI 360.** n.d. *Governance, agriculture & food security* [online]. Washington, DC. [Cited 31 August 2020]. www.fhi360.org/sites/default/files/media/documents/resource-id-governance.pdf

**FoodSafetyTech.** 2019. *The digital transformation of global food security* [online]. Edgartown, USA. [Cited 31 August 2020]. <https://foodsafetytech.com/feature_article/the-digital-transformation-of-global-food-security/>

**Food & Business Knowledge Platform.** n.d. Partnerships for food security. In: *Themes* [online]. The Hague, the Netherlands. [Cited 31 August]. https://knowledge4food.net/theme/partnerships/

**Gaza Urban & Peri-urban Agriculture Platform.** n.d. *GUPAP Strategic Profile 2019-2021* [online]. [Cited 31 August 2020]. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/GUPAP%20Strategic%20Profile\_2019-2021.pdf

**ILO.** n.d. *Decent work and the 2030 Agenda for Sustainable Development* [online]. Geneva, Switzerland. [Cited 31 August 2020]. www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-lisbon/documents/event/wcms\_667247.pdf

**International Center for Biosaline Agriculture.** 2019. *Moroccan rural women come together to create quinoa value chain link* [online]. Dubai, United Arab Emirates. [Cited 31 August 2020]. [www.biosaline.org/news/2019-06-20-6821](http://www.biosaline.org/news/2019-06-20-6821)

**International Center for Biosaline Agriculture.** 2020. *How satellites help keep agricultural research going during Covid-19 pandemic* [online]. Dubai, United Arab Emirates. [Cited 31 August 2020]. www.biosaline.org/blogs/2020-06-18-7143

**Louhichi, R.** 2019. *Expérience réussie de la chaine de valeur lait. Atelier final et signature de la charte pour la réduction des pertes et gaspillage alimentaires* [online]. [Cited 31 August 2020]. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/Presentation%20Riadh%20%20Louhich%2019%20%20juillet%202019%20Atelier%20Final.pdf

**Mahtab S.B., Vishnuvardhan Rao, M. & Satyanarayana, G.** 2011. Diversification from agriculture to nutritionally and environmentally promotive horticulture in a dry-land area. *Sight and Life,* 25(1): 38-42.

**Manar, R.** 2020. *Contribution à l’évaluation des pertes de la filière laitière dans la région de Bizerte et étude de leurs impacts économique et environnemental* [online]. [Cited 31 August 2020]. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/Pr%C3%A9sentation%20PFE%20Manar%20Rahmouni%202020-converti.pdf

**May, D.** n.d. *Etude d’impact du froid à al ferme sur la qualité de lait et la rentabilité économique dans la région de Bizerte.* http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/Pr%C3%A9sentation%20PFE%20May%20Derouiche-converti.pdf

**Rigg, J., Salamanca, A. & Thompson, E.C.** 2016. The puzzle of East and Southeast Asia's persistent smallholder. *Journal of Rural Studies,* 43: 118-133

**Social Protection & Human Rights.** n.d. *Inclusion of vulnerable groups* [online]. [Cited 31 August 2020]. https://socialprotection-humanrights.org/inclusion-of-vulnerable-groups/

**Sourani, A.** 2020. Urban family farming; a strategy to enhance innovation & resilience of local food systems in crisis. Role of Farmer Organizations in Agri-Food Systems Innovation FAO RNE Zoominar Meeting, Cairo, the 20th of July 2020. http://assets.fsnforum.fao.org.s3-eu-west-1.amazonaws.com/public/discussions/contributions/GUPAP%20PPP%20%20to%20FAO%20Regional%20event-Cairo%20\_%2020.7.2020.pdf

**World Rural Forum.** n.d. What is the Decade? In: *The Decade* [online]. [Cited 31 August 2020]. www.familyfarmingcampaign.org/en/que-es-el-decenio/