ASSESSMENT OF POLICIES FOR LL1 (OLIVE MULTIFUNCTIONAL SYSTEM)

LEBANON CASE

WP3 - OUTPUT 3.1 - ACTIVITY3.1.6

LIVINGAGRO
Cross Border Living Laboratories for Agroforestry

ENI CBC Med Programme 2014 – 2020, first call for standard projects
Grant Contract Number: 38/1315 OP of the 29/08/2019

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Fo.Re.S.T.A.S.

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Introduction: Project Summary

“LIVINGAGRO – Cross Border Living laboratories for Agroforestry” project is funded under the ENI CBC Med Programme 2014–2020, first call for standard projects, and refers to thematic objective A.2 “Support to education, research, technological development and innovation”, priority A.2.1 “Technological transfer and commercialization of research results”.

With a total budget of 3,3 Million Euros and a 2,9 Million EU-contribution through the ENI CBC Med Programme, LIVINGAGRO project involves 6 organizations from 4 different countries (Italy, Greece, Lebanon and Jordan) and addresses the challenge of knowledge and technological transfer in Mediterranean agriculture and forestry systems for achieving and sharing good practices aimed at sustainable production, protecting biodiversity, enhancing transfer of innovation and increasing profitability for territories and main actors as well as stakeholders involved. Using an open innovation-oriented approach for co-creating economic and social values and interactions between supply and demand, eliminating geographical and cultural barriers, two Living Laboratories will be established focusing on olive multifunctional system (LL 1) and grazed woodlands (LL 2).

Expected results

- ✔ Creation of two Laboratories (Living Labs) on the themes of multi-functional olive systems and grazed woodlands whose activation phases include the localization and identification of relevant stakeholders;
- ✔ Establishment of "Living Labs" through specific agreements between public - private entities;
- ✔ Development of the dedicated ICT platform;
- ✔ Creation of a public-private community which shall include also people and launch of pilot actions aimed at experimentation;
- ✔ Stipulation of at least 4 research agreements between universities and research centers in collaboration with the economic operators of the project partner countries;
- ✔ Organization of 6 field visits by research institutions to assess and identify companies’ innovation needs;
- ✔ Cooperation between at least 8 companies / research organizations for the development of innovative activities and services;
- ✔ Activation of 6 courses related to the creation of innovative companies / startups;
- ✔ Creation of 10 corporate-scientific brokerage events in Jordan (4 B2B events), Lebanon (4 B2B events) and Crete (2 B2B events);
- ✔ Analysis and development of 10 new products / services for the agroforestry sector;

- ✔ Activation of 20 technology transfer and intellectual property brokerage services for companies, universities, research institutes and the general public.

Partnership

Beneficiary (LP):

Regional Forest Agency for Land and Environment of Sardinia (Fo.Re.S.T.A.S.), Italy

Partners (PPs):

PP 1: Italian National Research Council, Department of Biology, Agriculture and Food Science (CNR), Italy

PP 2: National Agricultural Research Center (NARC), Jordan

PP 3: Lebanese Agricultural Research Institute (LARI), Lebanon

PP 4: Mediterranean Agronomic Institute of Chania (MAICH), Greece

PP 5: ATM Consulting S.a.s. (ATM), Italy

Associated Partners (APs):

AP1: Autonomous Region of Sardinia, Dept. of Environment defense

AP2: Autonomous Region of Sardinia, Dept. of Agriculture and agro-pastoral reform

AP3: Coldiretti Sardinia

AP4: Regional Association of Sardinian Breeders

AP5: The Lebanese University (Faculty of Agronomy, Beirut)

Project Duration

September 2019 – September 2022 (36 months)

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INTRODUCTION

According to the Agricultural Census 2010, the total agriculture land area in Lebanon is estimated at 332.000 hectares, of which 231.000 hectares are cultivated (almost half 113 000 ha are irrigated), with an average land holding size of 1.36 ha (1.23 ha for irrigated holdings). The exploitation of these lands moved gradually from a cereal cropping to a cultivation offering higher added value (fruits, vegetables, etc.). The number of agricultural holdings is estimated at 170.000, with an average of 1.4 ha per holding.

In Lebanon a great effort is being made to improve the economic and environmental sustainability of a strategic sector such as agriculture. The Lebanese agricultural sector faces many problems that limit its growth and development. Organic agriculture aims at developing self-reliant and environment-friendly farming systems. Therefore, it can be considered an alternative to the current degraded agricultural systems. The identification of strengths, weaknesses of the organic sector and the requirements for its development allow to propose solutions for its development over the short, medium and long-term (M.R. Bteich, 2004). Climate change poses additional uncertainty to the future of Lebanese territories; where the economic impacts due to the changing climate would be experienced in different ways across the sectors and regions. The Lebanese Ministry of Agriculture (MoA), in the 2010 strategy and action plan, stressed the increasing risks of desertification due to climate change (P. Haydamous & R. El Hajj (2016)). Furthermore, the strategy for the years 2015–2019 formulated by the Ministry of Agriculture (MoA) using a participatory approach in strategic planning under the framework of the EU funded Agriculture and Rural Development Programme (ARDP) aims the development of the agricultural sector, and developing its capabilities in order to strengthen the management of Lebanese agriculture, and improve public agricultural services to farmers and Lebanese citizens.

Considering that 23.5% of the agricultural land in Lebanon is covered by olive trees, and more than half of the registered agricultural holdings in Agricultural Census 2010 reported having at least 0.1 ha of land planted with olive trees, it is essential to pay attention to this sector.

In terms of output value, the production of olives and olive oil represents approximately 10% of the total value of agricultural output. The olive oil value chain has a high potential of improvement and represents a good opportunity for economic development. However, olive oil production faces challenges common to the whole agricultural sector in Lebanon but it is widely recognized its importance for poverty reduction, employment creation, migration, trade, growth potential, the rural landscape, environmental implications such as waste generation and disposal.

1. POLICY SUPPORT TO OLIVE CULTIVATION IN LEBANON

1.1 THE OLIVE OIL VALUE CHAIN IN LEBANON

Lebanon is a rich and complex country with 19 religious communities struggling to cooperate in a country of barely 10,500 km2 and a government in trouble towards the agricultural sector after 15 years of civil war. The policies can have a deep impact on a key sector of the economy such as olive growing. Lebanon is the historical birthplace of the olive tree. Its Mediterranean climate and fertile soil are ideal for the production of olive oil, an oil that is used abundantly in the local gastronomy. However, the country is struggling to develop a quality product that would be competitive on the international market. The olive oil sector is thus an important economic and cultural, not to mention traditional, activity in many regions in Lebanon. Each region in Lebanon prides itself on indigenous olive trees and therefore a distinct type of olive oil. The environment (soil, altitude, climate and cultural practices) also produces special characteristics and tastes distinct to each region. Farmers favour olive tree growing because it does not require much management and day-to-day care once the seedlings are established, and also no irrigation since most areas under cultivation are rain-fed. Therefore, olive oil production is often associated with regions with poor access to water. Olive oil in Lebanon is mostly a family run and seasonal business, contributing a considerable proportion of household family activity and income.

However, the olive oil value chain in Lebanon is facing tremendous hardships in the form of high production costs, regional competition, sub-standard quality output that does not permit exports (specifically to Europe), and a lack of proper coordination and management between the main actors in the field.

One of the main bottlenecks in olive oil production is related to the small sizes of farmland plots, which results in excessive land fragmentation. Around 77% of olive oil producers in Lebanon are small growers, managing olive orchards of 5 dunums or less (1 dunums is about 1,000 m2), meanwhile large growers (fields greater than 10 dunums) represent 9% of the Lebanese olive oil farms and are owned by large families, religious institutions or major oil bottlers and traders. In many cases, olive farms are not managed by the land owners themselves, as they live in urban areas, but by specialists in olive production called “wood damans” who manage olive production and harvesting in return for payments in processed oil or cash to the landowners.

In addition to the high costs associated with land fragmentation, traditional production technics and high labour cost, fertilizers and pesticides inputs have further increased cost of production and reduced the competitiveness of Lebanon olive oil production. Lebanon olive oil orchards are characterized by a heavy alternate bearing productivity primarily due to farming practices rather than geographical location. Farmers in peripheral rural areas rely on hard (usually Syrian) labor to beat the trees, plough the land, and pick the olives increasing the cost of production.

Pruning, usually managed themselves by the majority of farmers, remains a poorly established technique in terms of correct application. According to a recent Italian cooperation report (Italian Cooperation, 2017), 50% of surveyed farmers affirmed that pruning operations as still problematic from the point of view of knowledge and access to appropriate equipment. The use of electrical pruning shear is still not widespread, and skilled pruners are rare.

Producers still strongly resist the necessary quality analysis of their oils. Only 16% of producers directly

implement quality analyses, while 76% do not know clearly the quality standards of the oil grades that they claim to produce. This producer behavior is primarily due to the lack of awareness of Lebanese consumer on olive oil attribute and their preferences for “sweet oil”. Producer do not perceive an added value in testing their products, because consumers do not require quality standards as understood and laid out in the international olive oil council.

Lebanese preferences in terms of olive oil quality has highly influenced the development of the milling process. Lebanese consumers do not have a high awareness of the main international olive oil quality standards or product origins, which minimizes the incentives for farmers and processors to improve their practices. After harvesting, there are several missteps (beating the trees for olives to fall, combining harvested fruits with olives fell out, transporting fruits in plastic bags and store it for up to 48 hours before pressing, using traditional mills with stone crushing and pressing mechanisms) that compromise the quality of the final product but also reduce overall orchard productivity. Moreover, plastic containers are often used to store the olive oil. Moreover, the olive oil production method generates pollution damages due to the dumping of the wastewater in the rivers or lands.

In Lebanon there is also a low consumption of olive oil compared to other countries such as Syria or Greece. Furthermore, a significant number of people have access to a direct supply of olive oil at production cost, and more importantly a large part of the production of olive oil is not intended for market use. Usually, households’ production surplus is either distributed to extended family or sold directly to network of family and friends. Marketing is the weakest stage across the olive oil value chain and it is affected by the competition coming from Syria. The pilling up of unsold olive oil, often stored in conditions that lead to a fast deterioration of its quality, is then sold at low prices for soap production and/or refined into lower quality oil. Marketing is one of the biggest challenges in the olive oil industry and, as such, active efforts have been made to fund national and international exhibitions that may help farmers and producers to connect with businesses. Some cooperatives were able to integrate high quality olive oil value chain but they remain a weak actor because of their lack of investment and growth capabilities. Lebanon’s high cost as well as low yield of olive production has negative consequences for its competitiveness in international markets. Moreover, Lebanon does not impose any traceability or labeling requirements with regards to origin, making it easier to blend oil imported from abroad that may be lower quality.

1.2 PERSPECTIVES AND CHALLENGES

The role of cooperatives plays a key role to tackle challenges related to land fragmentation and high cost of production. Ensuring a sustainable development of agricultural cooperatives in rural areas, by improving quality and productivity, ability to access to local and international markets, is crucial.

Farmers recognize the importance to adopt Good Agricultural and Manufacturing Practices (GAP and GMP) but there are many obstacles to overcome in order to bring innovation to individual households. Several cooperatives have had successful experience in introducing mechanical harvester that reduces in more than half the number of workers needed. Indeed, olive harvesting, and land ploughing alone contribute to approximately 60% of the total cost of production (Italian Cooperation, 2017).

The cooperatives have played a key role in improving the quality of olive oil production and milling services, including proper practices for storage as well as waste and by-product management. Nonetheless, most olive cooperatives could increase the volume of services provided to their members especially in term of

technical assistance for improved agricultural practices as well as the development of value chain and marketing strategies. Modern and competitive mills create minimum waste residues, as water is stored and reused for irrigation/fertilization and remaining solid waste are stored in the form of briquette to be used for winter home heating.

The environmental effects of agricultural intensification and food production, with negative impacts on soil and biodiversity, result in adverse feedbacks on climate, food security and on-farm income at local scale (Krausmann et al. 2013). The “Agroforestry Development Project of Degraded Land in Lebanon” were carried out to combat desertification, to prevent soil degradation and erosion, to increase awareness of all the interested groups nationwide, to introduce modern planning technologies. This project introduced the concept of agroforesty in the country (UNITED NATIONS 2005). Agroforestry systems comprise a long list of land management practices, including crop diversification, long rotation systems for soil conservation, homegardens, boundary plantings, perennial crops, hedgerow intercropping, live fences, improved fallows or mixed strata agroforestry. The well managed agroforestry can play a crucial role in improving resilience to uncertain climates (Uthappa A R et al., 2017). The economic gain could be improved by intercropping olive trees with other viable crops grown beneath the canopy (Rosati et al. 2012, Daoui and Fatemi, 2014). This may provide additional income, and promotion of the advantages of agroforestry practices may increase farmer interest in olive groves (Pisanelli et al. 2014). However, selection of the appropriate species and the development of targeted and innovative agronomic practices are important to improving the efficiency of agroforestry practices and the maximization of ecosystem services (Tsonkova et al. 2012). Among the wide range of species, the possibility of introduction of cover crops between olives and of boundary crops (such as medicinal, aromatic and melliferous species around the olive orchards) in order to increase farmers' income, can be an excellent course of action.

To face marketing constraints there is a need to improve marketing regulation especially in terms of olive oil denomination, according to the international olive oil council standards. Furthermore, regulations regarding import from Syria should be implemented to protect all market players. International donors supported several projects focused on the development of marketing strategies based on the production of high quality olive oil. These strategies have benefited several olive oil cooperatives that were able to create linkages with traders and aggregators of high-quality olive oil. However, these interventions have ignored the lower quality olive oil segment that also offer several opportunities for cooperatives to aggregate production and increase sales. They have encouraged cooperatives to rely on direct sales channels, through the support of production of high value-added olive oil. This may be starting to show its limits, as local market for such products is starting to show signs of saturation. Furthermore, a more diversified market strategy could allow better integration to more complex and diversified value chain. However, it is important to consider that there are significant export opportunities for high quality olive oil. A significant share of high-quality olive oil being exported could allow a de-saturation of the local market, and thus a significant return to both exporting and non-exporting farmers and cooperative. Nonetheless, in order to penetrate such market in a significant manner a major effort to improve competitiveness need to be made at all level of the value chain.

1.3 POLITICAL ISSUES RELATED TO AGRICULTURE AND OLIVE SECTOR

Political instability in Lebanon is one of the biggest impediments to promote trade and economic development. The Lebanese civil war (1975-1990) stalled the economic and social development and even if followed a reconstruction period from 1990 to 2005, after the Syrian army withdrawal in 2005, the country witnessed again a period of chronic political instability. The period of instability was exacerbated by the 2006 Israeli war, the domestic imbalances and local security tensions during 2008, and the 29-month presidential vacuum from 2014 to 2016, and, of course, the 2011 on-set of the Syrian crisis. Within that context, agriculture seemed to have acted as a resilient sector, however, dynamisms and self-resilience mechanism are hampered by the lack of public policies.

The process of law and policy making in Lebanon is not well defined. While government agencies including the Lebanese Parliament and the Council of Ministers prepare and release a battery of laws and regulations, procedures are not clear and inconsistent. For example, some draft regulations may require many years before enactment (e.g., EIA decree) while others are enacted in record time (e.g., health care waste decree). Upstream policy formulation is often lacking. Frequent cabinet reshuffles further delay and jeopardize policy making as new governments and ministers tend to shelve previous policies, or policies still in the making, and start all over with a new team of advisors. This stop-and-go approach has indisputably also affected the state of environmental affairs in the country (MOE/UNDP/ECODIT, 2011).

Agricultural policies in Lebanon were only tackled in the late 1950's during the Chehabist period. Pushed by increasing concern about inequality and poverty in rural area, a series of reform have restructured and significantly changed the agricultural policy landscape. These years witnessed the implementation of large projects. Currently, the Ministry of Agriculture is the main institutional actor influencing agriculture and agro-food policies even if some important issues related to agriculture and rural development do not fall under the direct responsibilities of MOA.

The MoA 2010-2014 strategy, explicitly provided for updating the legislative framework and development of chains to increase global competitiveness. These priorities have not changed under the 2015-2020 strategy but was maintained at very general levels and was not specific to the olive sector. The strategy revolves around the need to increase the competitiveness of agricultural production by increasing its productivity while ensuring conformity with international sanitary and phytosanitary requirements, thus facilitating access to international markets.

The Ministerial strategy proposed eight lines of action:

1. Improve food safety and quality of locally produced and imported products;
2. Increase productivity and competitiveness of the Lebanese agricultural products,
3. Improve the good governance and sustainable use of natural resources;
4. Strengthen agricultural extension and education:
5. Strengthen agricultural research and laboratories,
6. Develop the cooperative sector and mutual funds;
7. Develop the ministry of agriculture's capacities;
8. Respond to climate change impacts.

The new MoA policy plan for the next years is characterized by a strong environmental concerns. The Minister of Agriculture is maintaining the constructive relationship established between Lebanon and the United Nations (UN) organizations (Food and Agriculture Organization (FAO), Economic and Social

Commission for Western Asia (ESCWA), and World Food Programme (WFP)), a research institution (Lebanese Agriculture Research Institute (LARI) and key experts in the sector, to work more closely together on agricultural development and the agricultural strategy for 2021-2025. This strategy includes key policy recommendations aiming to improve cereal yield, reduce import dependency, improve food logistics, increase water use efficiency and productivity, increase public and private investment in agriculture, promote nutrition sensitive agriculture, and reduce food supply variability. Due to the strategic importance of the olive growing sector in Lebanese agriculture for reviving the Lebanese economy, in recent years the Government has encouraged olive oil cultivation through various initiatives by distributing pruning and harvesting machines, encouraging acquisition of more productive cultivars, and participating as an operational partner in various international development projects (EU / ICU, IFAD / ICU, MAEDGCS / LARI, Coop FR, etc.). Nonetheless, it is largely acknowledged that the MoA (Ministry of Agriculture) must rely on scarce resources, especially for supporting the spread of good cultivation practices.

The Ministry of Agriculture's efforts have focused on the increase in the value of the local market by increasing demand on the higher quality segment. With this target, the Ministry of Agriculture is implementing a long-term partnership with the Italian cooperation through the CIHEAM36 Mediterranean Agricultural Institute of Bari (Italy), which are the entities implementing the *Olio del Libano* program. Recently (2018), the Ministry has renewed its agreement with the CIHEAM and through it the Ministry committed to improving the quality of olive oil in Lebanon and ensuring that it is raised to international standards.

Moreover, the Ministry of Environment's (MOE) resolution imposes standard procedure on olive oil milling operations in order to minimize waste and residues. Acidic and contaminated water and large volumes of pomace are the two potential hazardous effluents produced by olive mills. The Resolution No. 250/1 of 2009 establishing the National Committee for Olive and Oil Olive in Lebanon. This Resolution is composed of 2 articles. Article 1 decree the establishment of the National Committee for Olive and Oil Olive in Lebanon composed of 9 specialists to propose new legislations related to the treatment of waste water resulting from oil presses, production of organic olive oil and, laying down sanitary requirements and conditions for olive presses. Article 2 deals with the management and internal organization of the Committee. There are 492 olive mills in Lebanon (MOE, 2006). The production of olive oil generates two types of waste: Olive Mill Wastewater (OMW) and pomace (a solid residue also known as olive cake). OMW is usually disposed off in streams and sewers, affecting water quality during the harvest season. The improper management of OMW has adverse environmental impacts due to its high organic and phenolic content affecting soil and water resources. To manage this waste stream, Lebanon hosted the regional project Integrated Waste Management for the Olive Oil Pressing Industries in Lebanon, Syria and Jordan (2005 and 2008). Funded by the EU, and implemented under the Short and Medium Term Priority Environmental Action Program II (SMAP II), the MOE hosted the project to introduce and mainstream an integrated system for olive oil waste management in all three collaborating countries (http://olivepress.moe.gov.lb).

One of the good achievements include the definition of environmental limit values for waste from the olive oil industry, as well as environmental guidelines for using treated OMW in irrigation. These limit values and guidelines were published through MOE decisions 100/1/2010, 101/1/2010 and 102/1/2010. In Particular, Resolution No. 101/1 of 2010 concerning the environmental requirements for obtaining licences for the establishment and/or investment of olive presses with the aim to protect the environment and prevent from pollution. The Ministry of Environment has the authority to give the licences of environmental

compliance for the establishment of olive presses. The main stages of oil extraction are listed in this Resolution. The Resolution defines the different contaminants resulting from olive presses (such as olive residues) and the environmental conditions required to obtain the licence (water management, air pollutants management and noise pollution management). Other general conditions are listed in the text comprising fire-fighting, protection of workers and smoking ban. The Resolution No. 102/1 of 2010 concerning the terms of reuse of olive residues in irrigation and defines the environmental impact due to the misuse of olive residues such as soil pollution, water pollution or air pollution. It sets out the terms of reuse of olive residues in irrigation. The Resolution forbids the addition of other wastes to the olive residues during the storage and transport phases. The Resolution provides for the basis regulating the use of olive residues in the irrigation of some agricultural lands. It also comprises the control procedure of the Ministry of Environment and the Ministry of Agriculture.

1.4 CONCLUDING REMARKS

The olive oil sector in Lebanon is still undeveloped due to land fragmentation, low productivity, lack of farmer's knowledge to implement Good Management Practices and consequently high costs of production and poor environmental sustainability. In the other hand, the olive growing sector in Lebanese agriculture has a strategic importance and it is crucial to support ongoing processes, through a programmatic approach that contributes to clarifying the development Policies (from project-to-program approach). In addition, it is clear the need for a clear identification of the themes of sector policy, and the resulting dialogue with the relevant authorities, during both the formulation, programming and start of interventions.

The improvement of the olive oil value chain to be effective, requires quick and sustainable actions aimed at supporting all actors in the private sector involved (potential providers of better services and marketing), including, when applicable, consumers, and not just the subjects considered most vulnerable (direct beneficiaries).

Strengthening producer organizations is a key task, but it requires a long time and considerable resources that are often not adequately ensured during the programming phase. The approach aimed at improving members' access to services should clearly defined within an entrepreneurial strengthening approach capable of rationalizing production processes.

Governmental policies should focus on supporting the high-added value Lebanese productive sectors and disseminate specialization principles and integration of production to achieve sustainable development goals that lead to fighting poverty and unemployment and achieving economic prosperity.

There is a need for the implementation of clear marketing regulation especially in terms of olive oil denomination, according to the international olive oil council standards.

The sharing knowledge with other Mediterranean countries like Italy can play an important role to face challenges of the olive oil value chain. The implementation of further cooperation projects, will permit the processes of improving household incomes in marginal regions and the creation economic opportunities for rural communities through a sustainable process of modernization of the sector.

Agroforestry systems can respond to these main needs of Lebanon agricultural sector since those practices are recognized to more resilient and sustainable than monoculture. Particularly, agroforestry can enhance the delivery of ecosystem services (carbon sequestration, biodiversity conservation, landscape improvement, better water quality), diversify products and farmer income, promote rural tourism.

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