



INTERNATIONAL LABOUR ORGANIZATION

Value Chain Analysis and Project Recommendations for Gaziantep and Kilis Olive and Olive Oil Sectors

## Value Chain Analysis for Decent Work Opportunities

### Value Chain Analysis and Project Recommendations for Gaziantep and Kilis Olive and Olive Oil Sectors

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March 2018





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### Abbreviations

<b>ABGS</b>	[Turkish] Secretariat-General for European Union Affairs
<b>ABIGEM</b>	European Union Business Development Centre
<b>ACEV</b>	Mother Child Education Foundation
<b>ANAEM</b>	Ankara Nuclear Research and Education Centre
<b>ANTHAM</b>	Ankara Nuclear Agriculture and Livestock Research Centre
<b>ARDSI</b>	Agriculture and Rural Development Support Institute
<b>BUGEM</b>	General Directorate of Plant Production
<b>DSI</b>	General Directorate of State Hydraulic Works
<b>EIB</b>	Aegean Exporters Union
<b>EU</b>	European Union
<b>EZZIB</b>	Aegean Olive and Olive Oil Exporters Union
<b>GAP RDA</b>	Southeast Anatolia Project Regional Development Administration
<b>GAP</b>	Southeast Anatolia Project
<b>GHG</b>	Greenhouse Gas
<b>GKGM</b>	General Directorate of Food and Control
<b>GSO-MEM</b>	Gaziantep Chamber of Industry – Vocational Training Centre
<b>IA-OOTO</b>	International Agreement on Olive Oil and Table Olives
<b>IKA</b>	Silk Road Development Agency
<b>ILO</b>	International Labour Organization
<b>IOC</b>	International Olive Council
<b>IOOC</b>	International Olive Oil Council
<b>IPARD</b>	European Union Instrument for Pre-accession Assistance Rural Development Programme
<b>KOSGEB</b>	Small and Medium Enterprises Development and Promotion Administration
<b>MAM</b>	Marmara Research Centre
<b>MoFAL</b>	[Turkish] Ministry of Food, Agriculture and Livestock
<b>MoNE</b>	[Turkish] Ministry of National Education
<b>MoSIT</b>	[Turkish] Ministry of Science, Industry and Technology
<b>NGO</b>	Non-Governmental Organisation
<b>R&amp;D</b>	Research and Development
<b>SANAEM</b>	Sarayköy Nuclear Research and Training Centre
<b>T.R.</b>	Republic of Turkey
<b>TAEK</b>	Turkey Atomic Energy Agency
<b>TAGEM</b>	General Directorate of Agricultural Research and Policies
<b>TGNA</b>	Turkish Grand National Assembly
<b>TIM</b>	Turkish Exporters Assembly
<b>TOBB</b>	Union of Chambers and Commodity Exchanges of Turkey
<b>TRGM</b>	General Directorate of Agricultural Reform
<b>TSE</b>	Turkish Standards Institute
<b>TTO</b>	Technology Transfer Office
<b>TUBITAK</b>	Scientific and Technological Research Council of Turkey
<b>TURKPATENT</b>	Turkish Patent and Trademark Office
<b>TURKSTAT</b>	Turkish Statistical Institute
<b>TZOB</b>	Turkey Union of Chambers of Agriculture
<b>UGTP</b>	National Food Technology Platform
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UR-GE</b>	Supporting the Development of International Competitiveness Project
<b>USA</b>	United States of America



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<b>USD</b>	United States Dollar
<b>UZZK</b>	National Council for Olive and Olive Oil
<b>VC</b>	Value Chain
<b>VCA</b>	Value Chain Analysis
<b>ZZTK</b>	Olive and Olive Oil Promotion Committee



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### **1. Introduction**

The Syrian refugee crisis, now in eighth year, is one of the largest, persistent and complex humanitarian crises of modern times. The impact of this conflict is gradually increasing in economic and social spheres, adversely impacting the economic activities, causing income losses, and making access to public services of good quality in the refugee-hosting countries, which already had socio-economic challenges before the onset of the crisis. The Syrian refugee crisis is of international interest due to the unprecedented population movement. Refugee-receiving countries face significant challenges in dealing with the situation and supporting host communities. While humanitarian response is always a higher priority, now the focus has started shifting to providing livelihood support.

In this context, the International Labour Organization (ILO) plays an important role in the component of the livelihoods provided in the Regional Refugee and Resilience Plan (3RP), coordinated by United Nations (UN) agencies and development partners. The ILO Office for Turkey has developed a three-pronged strategy for Syrian refugees in Turkey:

1. Contribute to the creation of a skilled, competent, and productive labour supply to facilitate the access of temporary protected Syrians and host communities to 'Decent Work'
2. Support local economic development in specific sectors and geographical regions by creating jobs or promoting entrepreneurship for Syrians under temporary protection and host communities,
3. Support the strengthening of Turkish labour market administration and mechanisms in the implementation of comprehensive development strategies.

Under these strategies, the ILO Office for Turkey is developing projects in Şanlıurfa, Gaziantep, Adana, Mersin, Hatay, Ankara, and Istanbul in order to improve livelihoods and decent work opportunities in various areas. In order to increase the employment of refugees and host communities, both labour supply and demand are focused; projects are being developed to increase the institutional and operational capacity of relevant public institutions, employers' and workers' organisations.



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### 2. Value Chain

The basic schema of the value chain is as follows. ILO plans to support this value chain, facilitate the value chain, and increase the productivity of the units and the sector independently without intervening in the units (such as private sector, NGOs, public institutions). ILO plans to identify areas where the sector is failing to move forward and ensure that the cluster acts in a results-oriented approach, and to be unifying and guiding by justifying different analytical frameworks for the market.

As can be seen in the following value chain diagram, the key processes are supply, production, sales and marketing. For all these processes; information, communications, and regulations are important. In respect of information and communications; knowledge, infrastructure, and related services influence the process.

**A) Knowledge:** It is important to capture information held on supply, production, sales and marketing.

For example, it is important for the olive sector to identify what knowledge is held in the locality and what part of it is already being practiced:

- Making an inventory of olive saplings in Gaziantep and Kilis,
- Identifying saplings suitable for climate and geography,
- Planting appropriate saplings,
- Olive picking process when olive oil level is high,
- Harvesting mechanically in order to avoid damaging branches and leaves; that is, collecting by hand and comb; identifying the appropriate machine and appropriate harvesting distance if to be machine harvested,
- Processing separately olives that fall on the ground and olives that are picked from the upper branches, without mixing with each other,
- Delivering the collected olives to the pressing facilities at the right time (without waiting),
- Capturing the quantity of yield correctly.

In addition, having knowledge of trends in the world and acting on up-to-date information increase the capability of long-term strategic planning.

**B) Infrastructure:** The infrastructure refers to water and energy resources required before, during and after the harvest and to olive oil and brining facilities. With the increase in the number of modern facilities, the quality of olive and olive oil has increased. When lacking adequate facilities, harvested olives waiting in plastic bags release blackwater and have higher acidic levels. Another important issue in the infrastructure is to switch to a dual phase system for disposing of the blackwater, sending it to treatment pools rather than releasing into soil, thus using it in the industry.

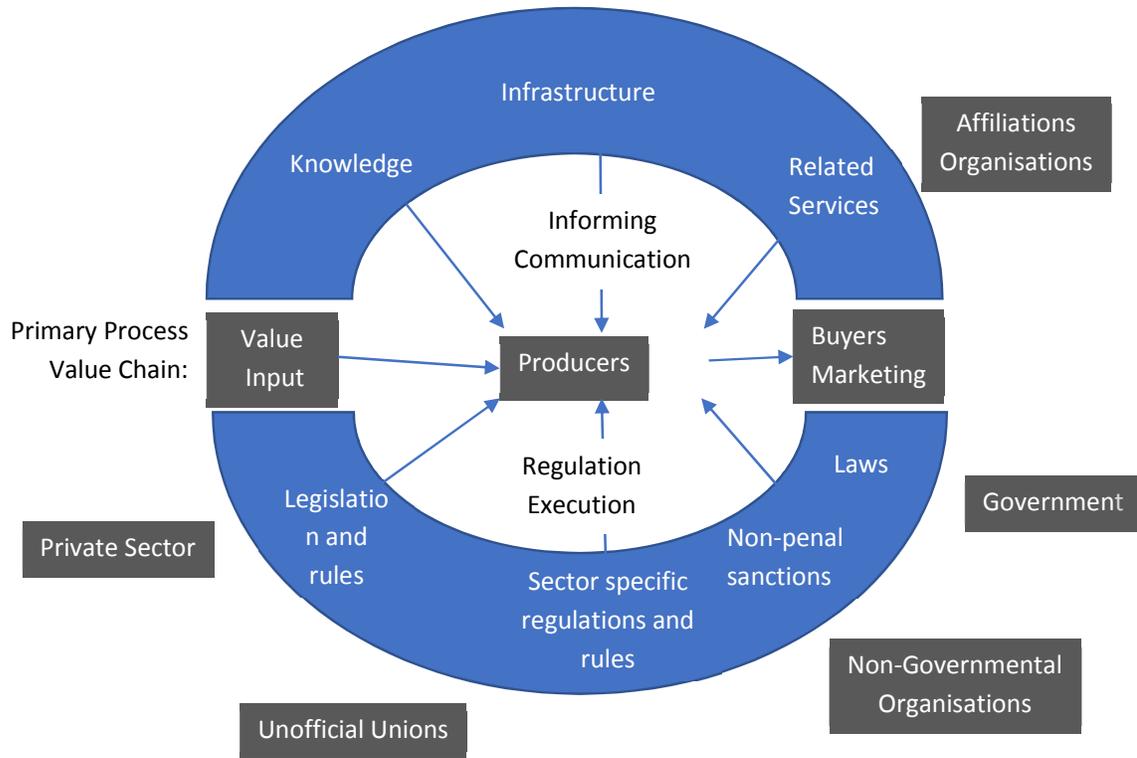
Irrigation facilities, water resources and, accordingly, the use of electricity have become more important with climate change. Due to drought; alternative water channels drip irrigation, deeper drilling are needed which causes higher consumption of electricity.

**C) Related Services:** Associations and unions in the sector receive services from relevant public institutions and organisations in such areas such as yield, training, saplings, irrigation and marketing.



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In the “regulation and execution” section of the value chain, there are legislation and rules, sector specific regulations and rules, and non-penal sanctions and laws. The second link of the value chain includes private sector, unofficial unions, NGOs, and government.



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### **3. Objectives and Expected Findings**

The objective of this study is to develop a framework to support the development of sector opportunities and the elimination of sector constraints by encouraging the implementation of international business standards in value chain links in order to create 'decent work' in the olive sector in Gaziantep and Kilis. The olive value chain was analysed in order to contribute to local economic development, facilitate dialogue among stakeholders in the olive industry, and promote gender equality. The following studies were carried out for the Value Chain Analysis (VCA):

1. A desk study was undertaken and ILO documents reviewed to conduct an analysis of the target audience in respect of the selected sector/sub-sectors, products, potential, and economic trends.
2. The set of questions was prepared for use in one-on-one interviews and focus group meetings. The study plan and method were prepared for the analysis of results.
3. Interviews were held with the key actors and organisations of the sector, public institutions, development agencies, NGOs, research institutes, and other relevant institutions, and focus group discussions were conducted to identify local economic growth, profitability, and potential employment, current market links, problems, challenges, and employment opportunities for Syrian refugees and host communities.
4. Workshops were conducted, with participation of ILO officials and selected value chain stakeholders to discuss the findings and collected data, facilitate social dialogue for the identified sub-sectors/products for the agricultural sector, and improve the gender equality approach.
5. The draft report, which included the results of the interviews, focus group meetings, and value chain stakeholder workshop, was prepared and submitted to the ILO Office for Turkey.
6. The draft report was finalized which contained a list of organisations interviewed in line with ILO's 'Development of Value Chain for Decent Work' proposal and its content.

The next step will be the presentation and analysis of the main findings with the participation of the ILO Office for Turkey and the relevant stakeholders at central and local levels.

#### **3.1. Preliminary Research to Identify Value Chain Actors**

Before this study was started, preliminary research was conducted for the pistachio and olive sectors in the field of agriculture. The preliminary research investigated the development of sectors, 'decent work' volumes and target groups. The resources used for this study are listed in the References section.

In the process of exploring the sub-sector for the agricultural sector, preliminary discussions were held with the following institutions and individuals.



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<i>Institutions/Organisations</i>
Gaziantep Chamber of Commerce - Help Desk for Syrians
Gaziantep Chamber of Industry - Vocational Training Centre (GSO-MEM)
Gaziantep Commodity Exchange
Southeast Anatolian Exporters Union
Silk Road Development Agency (IKA)
Syrian Businessmen Association
Syrian Economic Forum
<i>Institutions and Organisations Related to Agriculture</i>
Kilis Chamber of Commerce and Industry
Nizip Chamber of Commerce and Industry
Nizip Commodity Exchange
Gaziantep University Department of Food Engineering
Gaziantep Provincial Directorate of Food, Agriculture and Livestock
Gaziantep Metropolitan Municipality Agriculture Department



Photo: Nurhan Keeler (November 2017) Gaziantep, Olive grove

### 3.2. Preliminary Information on Syrian Labour Force and Entrepreneurs

During the preliminary interviews and desk study, it was discovered that Syrians who lost their income and had difficulty in accessing public services in Turkey did indeed contributed positively to some sectors in Gaziantep:



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- Since the beginning of armed conflicts in 2011, Syrians have established 6,000 new companies in Turkey, and some estimates suggest that the capital of Syrian companies is around 1 to 1.5 billion USD.<sup>1</sup>
- According to the data of Nizip Chamber of Commerce, approximately 20-25 soap factories in Nizip which were previously not operational are now operated by Syrians, and the sector is becoming lively both in domestic and foreign markets.
- Most of the interviewees stated that the problem of not finding workers in the agricultural sector was overcome with the supply of Syrian workers. The inability to find workers to work in the field for the preparation of soil, harvest, and post-harvest operations is frequently mentioned by different institutions and organisations, farmers, processors, traders, suppliers, and NGOs. It is common for Turkish workers to say that they do not prefer to work in the agricultural sector and that they subsist with the assistance in kind and in cash they receive. Syrian workers, on the other hand, migrate to large cities with aspirations of getting continuous, decent employment. Some farmers rent their fields to Syrian workers in return for the half of crop (i.e. “sharecropper”) to ensure the continuity of Syrian workers.
- In 2015, according to the statement by Abdurrahman Heseni, a member of the Agricultural Council, 30% of olives grown in Syria come from the canton of Efrin. There are more than 20 million olive trees in Efrin; 85% of these are large, mature trees each yielding 150-200 kg of olives. 174 of the 190 olive factories are in operation. In a good season and under normal conditions, there is capacity to produce 185 tonnes of olive oil. Everything produced from olives is put to good use and olive kernels (/stones) are converted into hookah charcoal. In Efrin, there are 22 olive kernel factories and 12 soap factories.

There is no inventory of Syrians’ profiles and abilities. First of all, the skills of Syrian refugees and the population who tend to stay in Turkey should be determined, and then a roadmap should be developed and policies formulated.

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<sup>1</sup> Building Markets, (2017) Another Side to the Story: A Market Assessment of Syrian SMEs in Turkey, (2017). (The study was conducted in 2017 in Turkey interviewing 230 Syrian operators. The study and report writing were funded by the Global Affairs Canada (GAC) and executed by Building Markets).



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4. Methodology and Interviews

In November 2017, a total of 74 meetings were held to analyse the value chain. Fifty-six of the interviews were conducted in one-on-one format. A meeting was held in the form of a mini-focus group meeting consisting of three people and another large focus group meeting consisting of 15 others.

Before starting the interviews, the resource list was examined to draw up the list of potential interviewees. During the interviews, the snowball method was used. In this method, the interviewees and institutions were asked whom else should be interviewed for useful analysis. In line with the responses received, these individuals and organisations were included in the interviews.

Included in the discussions were the managers and representatives of associations, institutions, farmers, retailers and manufacturers. discussions were held in central Gaziantep, Burç, Nizip and Kilis. The list of institutions, organisations and persons interviewed is given in Annex-1.

4.1. Set of Questions

In the interviews, a pre-determined set of questions was used covering economic, environmental, social and institutional criteria of ILO. A flexible approach was taken on the basis of progress of the interview, time and person interviewed, with questions being expanded, modified or narrowed.

<p><b>Economic dimension:</b></p> <ul style="list-style-type: none"> <li>• Market and Entrepreneurs (+/-) growth trends</li> <li>• Sector's ability to create value added</li> <li>• Innovation approach</li> </ul>	<p><b>Social dimension:</b></p> <ul style="list-style-type: none"> <li>• Gender equality, prioritizing employment of women and young people</li> <li>• Identify barriers to employment and entrepreneurship</li> <li>• Prevent child labour</li> </ul>
<p><b>Environmental dimension:</b></p> <ul style="list-style-type: none"> <li>• Use of natural resources (water, energy etc.) and natural materials</li> <li>• Impact of production on the environment</li> <li>• Energy use, carbon emissions, carbon footprint</li> </ul>	<p><b>Institutional dimension:</b></p> <ul style="list-style-type: none"> <li>• Whether sector players are ready to act in concert</li> <li>• Whether they accept a win-win philosophy against competitors, suppliers, employees and customers</li> <li>• Whether they are experienced and competent for projects to be developed</li> <li>• Official and legal obstacles</li> <li>• Institutions with which they are ready to cooperate</li> </ul>



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The questions used in the interviews are as follows:<sup>2</sup>

#### **Economic Dimension:**

1. What is the expectation of growth for the olive and olive derivatives market?
2. Can the demand be met? Is there market demand that the sector fails to meet seasonally? Are buyers, i.e. consumers, willing to buy more of the product?
3. Can olive and olive derivatives be import-substituted? Is there such a development/projection?
4. Has (self-)employment/entrepreneurs in the sector in the last five years increased, decreased or remained the same? What are drivers/causes?
5. What are the growth prospects and opportunities for job creation in the sector? What are the expectations in this regard?
6. Has the value creation in products (value-added products) in the sector in last five years increased, decreased or remained the same?
7. Is there room for improvement in production processes for the existing market? Is it possible to develop new products in the sector?
8. What is the production cost? Can the price be made more attractive for the buyer? Can a win-win opportunity be created?
9. What are the advantages and disadvantages of the product in national and export markets?
10. Are infrastructure, qualified labour force, raw materials, and inputs sufficiently available at comparative prices and sufficient quality?
11. Do enterprises in the sector have the management and technical capacity for innovation and development?

#### **Environmental Dimension:**

1. How do environmental issues affect VC?
2. Which (natural) raw materials are used in the sector? Even if the raw material is natural, is it processed and used through natural methods?
3. Which type of energy resources are consumed at what quantity?
4. How does VC impact the soil (environment) and its future production potential?
5. How does the production impact water resources?
6. Does the production cause air pollution? What is the level of carbon footprint, GHG emissions?

**Social Dimension:** How can Syrians and Turkish citizens, particularly women, contribute to VC? Which function/role can they assume?

2. What is the volume/potential of employment of Syrians and Turkish citizens, particularly women, in this sector?
3. Do Syrians and Turkish citizens, particularly women, have the necessary skills? In what areas is greater inclusiveness feasible?
4. How do Syrians and particularly women, disadvantaged groups affect the market, equipment, sales and income?
5. What are the entry barriers for Syrians and Turkish citizens, particularly women, to this sector? What are the causes?
6. Is there child and/or forced labour in VC? If so, where and to what extent?

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<sup>2</sup> GIZ GmbH, (October 2015), Guidelines for value chain selection: Integrating economic, environmental, social and institutional criteria.



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### **Institutional Dimension:**

1. What can the enterprises/private sector itself solve in this field? Is public investment needed? If needed, why could this public investment be necessary? What difference and contribution will public investment make?
2. Do private sector, government and donors invest in VC, or have realistic plans to do so? How?
3. Are sectoral policies in place?
4. Does the government provide tangible support? Can this be expected? How?
5. Do producers have (easy) access to markets? Are there physical, regulatory or other obstacles to market entry?
6. Are chain actors open to exchange and cooperation? How?
7. Which donors/supporting organisations are ready to collaborate?
8. What is the potential for win-win cooperation between value chain actors and supporters?
9. Are there adversities, barriers which may impact the progress of the programme that will be formulated on the basis of results of VCA?
10. Are innovation opportunities in the sector tested and validated?
11. Do actors have the competence/ability to organise (to act in concert)?
12. Is the organisational capacity of actors sufficient for the tasks ahead?
13. Are business development services and other support services for quality improvement of the various VC stages sufficiently available and affordable?
14. Are project finances available?



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### **5. Findings**

#### **5.1. Olive Tree and Fruit**

Capable of living up to 2,000 years, the long-lived olive tree is an evergreen plant (not shedding its leaves) with its long bushes or dense branches. The olive tree blossoms in spring and the olive fruit begins to ripe in summer. From September to November, the colour of olives changes; the fruit changes from green to purple and from purple to black and completes the process of ripening. This stage is called “veraison.” The harvest of ripe olives continues from February until September. The quality of the olive oil obtained is closely related to how olives are collected and processed. The highest quality olive oil is obtained from olives collected from the branches one by one. Olives can also be collected by waiting for them to drop on the ground or by using a sucking machine that sucks the fruit.

Olives set aside for oil making first undergo defoliation and washing in automatic machines. Then they are pressed under pressure, so that the oil is obtained from the fruit’s flesh. Approximately 10 kg olives are used to produce 1 kg of early harvest olive oil.

#### **5.2. Olive and Climate Change**

While olive trees have long been fruiting every other year, they have in recent years been “two years off, one year on” (i.e. periodicity; trees bearing fruit one year and bearing none or little the next year). In the past few years, this has been reduced to a normal crop one year, and almost nothing for *two* years. This observed change in periodicity is due to climate change and erroneous cultivation practices used in pruning, irrigation, harvest, storage, processing. Some pistachio and olive producers have started to develop irrigation projects because of the increasing irrigation needs associated with climate change.

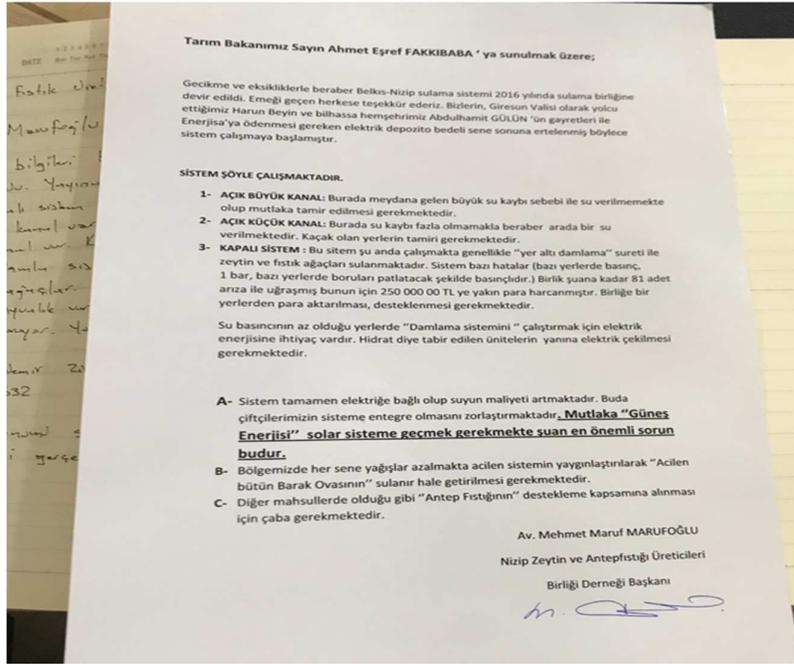
Nizip Chamber of Industry and Commerce announced a call in November 2017 under the project “Supporting the Development of International Competitiveness of Olive” (URGE). Many of the olive producers and processors did not respond to the call of the project because they had no crops that year.

The following petition was prepared by Nizip Olive and Pistachio Producers’ Association to be sent to the Minister of Food, Agriculture and Livestock. The petition states in summary that since the rainfall in the region has decreased every year, an irrigation channels system must be developed to urgently irrigate the entire Barak plain. When the water pressure is low, the electricity demand and the cost of the water increases. For this reason, petitioners expect financial support from the Ministry for the transition to solar energy.



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The following photograph was taken in November 2017 in Gaziantep's Burç village. The "Gemlik type" olives were irrigated last summer due to drought. Farmers have to incur rising costs of water and transport by transporting more water in tankers (approximately 300 trees are irrigated in half a day).



Photo: Nurhan Keeler (November 2017) Gaziantep, Burç

The olive tree is an evergreen plant that consumes water around the year, with a 400-600 mm per year of rainfall requirement (600-800 mm for high yield). The olive tree needs water most in the summer months. In summer, the amount of water needed varies according to climate, plant's genetic strain, physiological conditions (such as soil flora), and plantation status (especially tree planting density and pruning mode).



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Research on potential evapotranspiration based on the determination of water consumption by various researchers in olive-growing countries has shown that actual evapotranspiration is around 60-70% of the potential in olive trees. The water requirement of olive trees was determined as 186 mm in the beginning of development and in the formation of inflorescence, 50 mm in the flowering stage, 378 mm in the growing stage of fruits, and a total of 764 mm during the ripening stage of fruits.

The view that olive irrigation will not be economic is not valid. Observations in olive-growing areas show that the yield of the irrigated trees due to the low level of rainfall in the summer months is much higher than to that of non-irrigated trees.

In the olive grove areas where the winter precipitation is around 500 mm, the irrigation is applied twice, during and after the kernel hardening phase. In cases where the winter precipitation is insufficient, the irrigation can be carried out three times in the early spring flower bud stage, 2-3 weeks before flowering, at the beginning of the flowering stage in the early summer, and especially during the fruit formation stage in which the kernel hardening starts. It can also be done when the fruit is at 1/3 of its normal size and at full size.

The following photograph was taken in an early harvest olive grove in Şahinbey district of Gaziantep in November 2017. The crop, which is not yet ready for harvest, is harvested early in order to save as much of the crop before it rains because no one can be found to collect it. Most of the farmers in the region have such a tendency.

Farmers interviewed indicated that they could not bear the cost of irrigation, whereas it is normal to get twice the yield if such a cost would be met. They stated that they received crops without making much effort on olive trees prior to the climate change.



Photo: Nurhan Keeler (November 2017) Gaziantep, Şahinbey



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They also stated that they should not ignore the fact that the other fruit trees planted amongst olive trees to prevent erosion and to make more profit from the soil needed more water than olive trees. Olive tree needs less water than other cover plants.

"Plant Water Consumption Guide for Plants Irrigated in Turkey" was published in 2016 in Ankara by the General Directorate of Agricultural Research and Policies (TAGEM)<sup>3</sup>, General Directorate of State Hydraulic Works (DSI). The investment costs are high for large irrigation systems. Realistic indicators need to be taken into account when constructing and implementing these systems. The most important of these indicators include plant water consumption, plant pattern, characteristics of water source, soil and topographic characteristics, and socio-economic structure. Plant water consumption figures are needed in the calculation of irrigation projects' channel capacities and irrigated areas. Therefore, the "Plant Water Consumption Guide" is an essential national resource that is absolutely necessary for irrigation planning, sustainable soil management, preventing soil degradation, field improvement services and realization of large irrigation projects.

In the Tenth Development Plan<sup>4</sup> of Turkey, the "Efficient Use of Water in Agricultural Irrigation" was listed as the "Priority Transformation Programme". Under this programme, one of the policies and actions covering the years 2015-2018 was that supporting policies should be based on water restrictions. Determination of the optimum product pattern according to the potential of water resources, provision of suitable demand-based irrigation method should be taken as the basis of water resources potential.

According to the New York Times author Somini Sengupta, 24 October 2017<sup>5</sup>, Italian olive producers expect a 20% decline in olive production due to the dry season. Expectations of decline are worse for Spain and Greece. The taste of the product is expected to increase in quality but decrease in quantity; the taste becomes intensive when the roots have to descend to deeper layers of the soil in search of water and minerals.



Photo: Massimo Berruti, olive harvest in Capezzana, Continini Bonacossi family living in Praato, Italy, The New York Times

<sup>3</sup> TAGEM, DSI, (2016), Türkiye’de Sulanan Bitkilerin Bitki Su Tüketim Rehberi [Guide to Plants Irrigated by Evapotranspiration in Turkey]

<sup>4</sup> Tenth Development Plan, Action Plan for Efficient Use of Water in Agricultural Irrigation 2014 – 2018

<sup>5</sup> How Climate Change is Playing Havoc with Olive Oil and Farmers, (2017), The Newyork Times



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### ***Modeling of climate change: OLIVECAN***

Models are being developed for improvement strategies for the olive tree against future climate change. One such model is OLIVECAN that simulates basic olive growth and development processes developed by Cordoba University and IAS-CSIC. OLIVECAN is a simulation model that measures how olives grow and develop, taking into account climate, soil and grove variables, and possible yield, and simulates factors such as soil erosion, water evaporation, surface erosion.

In olive farming, condensation (more frequent planting rather than less) is experienced: olive is in transition from sparse and traditional plantation to concentrated traditional plantation and highly mechanized systems. This process and concentration pose risk to the environment as they require more water. The course of climate change also provides clues that the current situation will not improve. Therefore, the OLIVECAN modelling project was undertaken. The aim of this project is to develop effective methods of supporting long-term investment decisions and adaptation management strategies for olive tree cultivation in the Mediterranean. Thanks to these methods, farmers aim toward a sustainable ecosystem, adaptation of olive trees to changing environmental conditions, and profitability. OLIVECAN will produce modelling solutions in the Mediterranean to assess the impact of climate change on olive farming systems and support sustainable development. The solutions are intended to add flexibility to agricultural management strategies.

OLIVECAN simulation and analysis focus on the following issues:

**Water use:** To optimize irrigation water yield per land area when irrigation is unavoidable.

**Soil protection:** The risk of soil erosion in olive groves is high. It is difficult to engage in planting which would not require high percentages of the exposed surface and water use. Growing plants that will serve as cover to hold the exposed areas.

**Carbon balance:** The effect of different irrigation strategies (timing and quantity) and soil management (presence/type of cover plant, waste or biomass combination) on net carbon change will be evaluated in the long term taking into account the CO<sub>2</sub> effect released into the atmosphere.

**Agro-energy potential:** Identifying the amount of biomass that can be produced as pruning material, which is an energy source in olive groves.

**Olive farming design:** Olive farming has recently evolved; plant density increased from the ranges of 100-200 (traditional) to 400-600 (high density) to >1500 trees/ha. The sustainability of these new olive farming systems (both under present and future climatic conditions) will be assessed. Simulations with OLIVECAN may reveal in which regions and climatic conditions the new groves can survive. Regression analyses will be conducted to identify the causal relationships between olive oil chemistry and climate variables and quality indicators.



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**5.3. Agricultural Lands in Gaziantep and Kilis**



The total agricultural land in Turkey decreased by 21% in 2015 compared to 2002. This ratio is 6% for Gaziantep. Data for 2002 could not be found for Kilis. According to the 2009 data available, the total processed agricultural area in Kilis decreased from 59,494 hectares to 46,599 hectares in 2013, corresponding to a contraction of 22%.

Gaziantep Agricultural Land (ha)	Gaziantep			Turkey			Gaziantep / Turkey Ratio (%)
	2002	2015	Change (%)	2002	2015	Change (%)	2015
Fruits	153,566	200,784	31	2,673,525	3,283,848	23	6.1
Vegetables	12,643	8,640	-32	930,227	808,507	-13	1.1
Field Plants	215,254	149,819	-30	22,975,466	16,149,102	-30	0.9
<b>Total Agricultural Land</b>	<b>381,463</b>	<b>359,243</b>	<b>-6</b>	<b>25,649,921</b>	<b>20,241,457</b>	<b>-21</b>	<b>1.8</b>

Source: T.R. Ministry of Food, Agriculture and Livestock, Department of Strategy Development, Agri-Investor Consultation Office/Gaziantep Agricultural Investment Guide

Distribution of Kilis Agricultural Land and Production Quantity		
	Area (decares)	2015 production (000 tonnes)
<b>Field Crops</b>	422,376	213
<b>Fruits</b>	517,475	172
<b>Vegetables</b>	66,258	183

Source: T.R. Ministry of Food, Agriculture and Livestock, Department of Strategy Development, Agri-Investor Consultation Office/Gaziantep Agricultural Investment Guide

A regulation issued in 2017 in Turkey was rescinded upon public reaction. That regulation defined that groves with less than 15 olive trees per decare would not qualify an olive grove (in EU, the figure is 2.5 trees per decare). This regulation was rescinded as a result of public reaction, and even the rate was reduced to 1 tree per decare. The new decree holds that no housing or hotels can be built on olive groves, but mining or industrial facility can be established with an authorisation from the board. The penalty for



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animal grazing in the olive groves was kept at prison sentence for up to three months. The penalty given to those who cut an olive tree was increased from 2,000 TL to 4,000 TL.

**5.4. Place of Olive Farming in Gaziantep and Kilis**

Olive production areas, and therefore total olive production, in Turkey have been increasing since 2012. Olive grove and certified olive sapling support also play a role in this increase. Among the support instruments applied during the years 2000-2008 were subsidizing purchases, input subsidies and direct income support. Support premiums have gone down and been replaced over the years by subsidizing purchases, but today it continues under the name of gap payment. The aids given in the year 2016 included diesel fuel for farm vehicles and fertilizer support (11 TL/decare) on the basis of field decare, organic agricultural support in the second category (70 TL/decare), vegetable and fruit good agricultural practices (50 TL/decare), gap payment (80 cents/kilogram), domestic certified sapling support (100 TL/hectare for standard groves, 280 TL/decare for certified groves using certified saplings), rehabilitation support of traditional olive groves (100 TL/decare).

Olive fields in Turkey increased by 37.6% in the 2000-2013 period with the support for certified saplings and grove-building provided by the Government after 2000 (MoFAL, 2014).

In 2017, the total olive production in Turkey increased by 2% compared to 2015/2016, and table olive production increased by 8%.

Turkey Olive and Olive Oil (000 tonnes)	2012/13	2013/14	2014/15	2015/16*	2017/17**	Change***
Total Olive Grove Area (000 decares)	814	826	826	837	846	1
Total Number of Olive Trees (million)	157	167	169	172	174	1
Total Olive Production (000 tonnes)	1,820	1,676	1,768	1,700	1,730	2
Table Olive Production (000 tonnes)	480	390	438	400	430	8
Olive Production for oil (000 tonnes)	1,340	1,286	1,330	1,300	1,300	0
Olive Oil Production*	201	160	190	215	177	-18
Olive Oil Imports (000 tonnes)	0	0	0	0	0	0
Olive Oil Exports (000 tonnes)	14	42	15	8	6	-18

Source: TURKSTAT, UZZK (National Council for Olive and Olive Oil) shows the change according to 2017 January/Forecast \*/Forecast \*\*/2015/2016 season one year ago \*\*\*

According to the 2017 data from TURKSTAT and National Council for Olive and Olive Oil (UZZK), the three most important provinces for olive oil farming and production are Aydın (21.1%), Muğla (15%), and İzmir (14.2%). Gaziantep's share in olive oil farming areas is 6.5% in Turkey, and the share of the Kilis is 4.3%.



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Source: TURKSTAT, UZZK (National Council for Olive and Olive Oil) 2017 January -Agricultural Products Markets

According to TURKSTAT and UZZK 2017 data, the top three provinces in olive oil production are İzmir (18.7%), Aydın (17.4%) and Hatay (10.7%). In olive oil production, Muğla has a share of 10% and Gaziantep has a share of 5%.



Source: TURKSTAT, UZZK (National Council for Olive and Olive Oil) 2017 January- Agricultural Products Markets

In Gaziantep, olive production increased by 111% from 2002 to 2015. The rate of increase for Kilis, which produced organic olives, was 77%. Instrumental in this outcome was the “Gemlik and Ayvalık type” olive saplings distributed by the state as incentives to farmers which grew and gave fruits in a short time.



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Gaziantep			
Fruit Farming	2002 Production (tonnes)	2015 Production (tonnes)	Change (%)
Grape	126,355	111,563	-12
Olive	49,205	103,919	111
Red pepper	6,875	41,100	498
Pomegranate	5,010	19,370	287
Pistachio	8,454	53,109	528
Kilis			
Fruit Farming	2002 Production (tonnes)	2015 Production (tonnes)	Change (%)
Grape	42,800	89,126	108
Olive	24,750	43,709	77
Red pepper	1,799	24,554	1,265
Pomegranate	295	9,651	3,172
Pistachio	721	2,271	215

Source: TURKSTAT, General Directorate of Plant Production (BUGEM), Agriculture Areas in Turkey <https://www.tarim.gov.tr/sgb/Belgeler/SagMenuVeriler/BUGEM.pdf>

In Gaziantep and Kilis, based on the development of modern olive farming, the need is increasing for processing facilities which will produce brine, olive oil, and for facilities which will recycle products such as olive kernels after processing of the product.

### 5.5. Global Data on Olive and Olive Oil

The global olive oil production volume is approximately three million tonnes. Olive oil production tends to increase with some fluctuation. Compared to the period of 2016/17, production is expected to increase by 14% and exports by 18% in the period of 2017/18.

Global Olive and Olive Oil (000 tonnes)	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17*	2017/18**	Change*** %
<b>Production</b>	3,321	2,401.5	3,252	2,458	3,176	2,539	2,894	14
<b>Consumption</b>	3,085.5	2,989	3,075.5	2,916	2,979.5	2,803	2,954	5
<b>Imports</b>	769	853	779.5	920.5	790.5	824	865.5	4
<b>Exports</b>	803	843	785	929	788.5	755	890.5	18

Source: International Olive Oil Council (IOOC), Estimate \*/Forecast \*\*/2017/2018 shows the change from the season one year ago\*\*\* <http://www.internationaloliveoil.org/estaticos/view/131-world-olive-oil-figures>

The share of EU countries in global olive oil production varies by years, still averages around 60%. In recent years, due to the climate change and demand for consumption, olive production has started in countries like Australia and Argentina.

The major olive-producing countries in the world are Spain, Italy, Greece, Turkey, Tunisia, and Morocco. Turkey's share in olive oil production is estimated to be 10% and consumption is estimated to be 6% for 2017/2018.



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Syria's share in production and consumption is estimated to be 3%. Before the crisis, Syria's production was above that of Turkey and Tunisia. There is no inventory of the status and number of olive trees in Syria after the civil war.

<i>Global Olive Oil Production (000 tonnes)</i>	<i>2011/2012</i>	<i>2015/16</i>	<i>2016/17*</i>	<i>2017/18**</i>	<i>2017/18 Share %</i>
<b>EU Countries</b>	2,395	2,324	1,747	1,805	62%
<b>Turkey</b>	191	150	177	287	10%
<b>Tunisia</b>	182	140	100	220	8%
<b>Morocco</b>	120	130	110	140	5%
<b>Syria</b>	198	110	110	100	3%
<b>Algeria</b>	39.5	82	63	80	3%
<b>Argentina</b>	32	24	21.5	37.5	1%
<b>Australia</b>	15.5	20	21	21	1%
<b>Others</b>	148	196	189.5	203.5	7%
<b>Total Global production</b>	<b>3,321</b>	<b>3,176</b>	<b>2,539</b>	<b>2,894</b>	<b>100%</b>

Source: IOC, Estimate\*/Forecast\*\* <http://www.internationaloliveoil.org/estaticos/view/131-world-olive-oil-figures>

<i>Global Olive Oil Consumption (000 tonnes)</i>	<i>2011/12</i>	<i>2015/16</i>	<i>2016/17*</i>	<i>2017/18**</i>	<i>2017/18 (%)</i>
<b>EU Countries</b>	1,790	1,660	1,463	1,549	52%
<b>USA</b>	300	321	315	315	11%
<b>Turkey</b>	150	116	155	170	6%
<b>Morocco</b>	122	120	120	120	4%
<b>Syria</b>	135	104	110	100	3%
<b>Algeria</b>	42.5	80	67	85	3%
<b>Brazil</b>	68	50	59.5	60	2%
<b>Japan</b>	43	53.5	54.5	55	2%
<b>Tunisia</b>	35	35	25	35	1%
<b>Others</b>	399.5	439.5	434	465	16%
<b>Total Global Consumption</b>	<b>3,085</b>	<b>2,979</b>	<b>2,803</b>	<b>2,954</b>	<b>100%</b>

Source: IOC, Estimate \*/Forecast \*\*

<http://www.internationaloliveoil.org/estaticos/view/131-world-olive-oil-figures>

Global olive oil exports (891,000 tonnes) stand at 31% of production (2,894,000 tonnes). Turkey's share in exports is 10%. Syria's olive oil exports declined from 30-40,000 tonnes to 20,000 tonnes between 2002 and 2007, and in recent years, it has ceased to report any exports. Although it is known that there is production in Syria, it is not possible to generate statistical data or reach the current data.



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<i>Global Olive Oil Exports (000 tonnes)</i>	2011/2012	2015/16	2016/17*	2017/18**	2017/18 pay%
<b>Turkey</b>	20	15	45	90	10%
<b>EU Countries</b>	555.5	573.5	555.5	531.5	60%
<b>Tunisia</b>	129.5	102.5	85.5	180	20%
<b>Syria</b>	25	6	0	0	0%
<b>Others</b>	73	91.5	69	89	10%
<b>Total Global Exports</b>	<b>803</b>	<b>788.5</b>	<b>755</b>	<b>890.5</b>	<b>100%</b>

Source: IOC, Estimate \*/Forecast \*\*

<http://www.internationaloliveoil.org/estaticos/view/131-world-olive-oil-figures>

According to the study report of Aegean Olive and Olive Oil Exporters' Association (EZZIB)- 2016-2017 season, Turkey's overall olive oil exports reached 12,754 tonnes in the entire 2015/2016 season (01.11.2015-31.10.2016 period), and this amount corresponded to 55.6 million USD in foreign currency earnings. In the previous season (2014/2015), 14,851 tonnes of olive oil exports reached 66.2 million USD. During the 2015/2016 season, olive oil exports were made to 109 countries and 5 free zones throughout Turkey.

The United States, Saudi Arabia, Iraq, Japan and Iran are the top export destinations for Turkey in monetary terms. Olive oil exports to the top 10 countries accounted for 75.34% of the total monetary value and 76.96% of the total quantity.

Compared with the last two seasons, olive oil exports decreased in quantity by 14% and in value by 16%. The exports of olive oil, which was 14,851 tonnes in the previous season, decreased to 12,754 tonnes and export income from 66.2 million USD to 55.6 million USD. The unit price receded from 4.45 to 4.36 USD.



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<i>Turkey Olive Oil Export</i>	<i>01.11.2014-31.10.2015 Quantity (tonnes)</i>	<i>01.11.2014-31.10.2015 Value (million USD)</i>	<i>01.11.2015-31.10.2016 Quantity (tonnes)</i>	<i>01.11.2015-31.10.2016 Value (million USD)</i>	<i>Change in Quantity (%)</i>	<i>Change in Value(%)</i>
<b>USA</b>	2,912,870	11,393,654	3,020,056	11,325,950	4	-1
<b>Saudi Arabia</b>	1,766,286	9,423,854	1,720,967	9,172,279	-3	-3
<b>Iraq</b>	1,263,215	5,029,466	901,537	4,206,338	-29	-16
<b>Japan</b>	1,473,936	6,656,070	836,780	3,825,738	-43	-43
<b>Iran</b>	1,171,415	4,935,342	882,090	3,534,137	-25	-28
<b>Spain</b>	100,440	277,929	875,920	2,798,980	772	907
<b>Germany</b>	571,144	2,700,801	363,505	2,122,762	-36	-21
<b>Cote d'Ivoire</b>	256,840	840,179	515,738	1,759,984	101	109
<b>United Arab Emirates</b>	509,804	2,743,261	307,921	1,613,630	-40	-41
<b>South Korea</b>	360,104	1,539,600	391,890	1,544,730	9	0
<b>Total top 10 countries</b>	<b>10,386,055</b>	<b>45,540,155</b>	<b>9,816,405</b>	<b>41,904,529</b>	<b>-5</b>	<b>-8</b>
<b>Others</b>	4,465,353	20,654,592	2,938,031	13,714,325	-34	-34
<b>Total</b>	<b>14,851,407</b>	<b>66,194,747</b>	<b>12,754,436</b>	<b>55,618,854</b>	<b>-14</b>	<b>-16</b>

Source: EZZIB

The largest share of global olive oil imports goes to USA with 35%. The share of EU countries is 18% in total global olive oil imports.

<b>Global Olive Oil Imports (000 tonnes)</b>	<b>2011/12</b>	<b>2015/16</b>	<b>2016/17*</b>	<b>2017/18**</b>	<b>2017/18 Share (%)</b>
<b>USA</b>	300	314	305	305.5	35%
<b>EU Countries</b>	96.5	97.5	131	157	18%
<b>Brazil</b>	68	50	59.5	60	7%
<b>Japan</b>	51	53.5	54.5	55	6%
<b>Canada</b>	39.5	41	39.5	39.5	5%
<b>China</b>	40	31	34	39	5%
<b>Saudi Arabia</b>	13.5	22	21	22	3%
<b>Russia</b>	27	19.5	19.5	20	2%
<b>Switzerland</b>	13.5	14.5	14.5	15	2%
<b>Mexico</b>	11.5	15	14	14	2%
<b>Taiwan</b>	5	6.5	6.5	6.5	1%
<b>Others</b>	103.5	126	125	132	16%
<b>Total Global Imports</b>	<b>769</b>	<b>790.5</b>	<b>824</b>	<b>865.5</b>	<b>100%</b>

Source: IOC, Estimate \*/Forecast \*\*

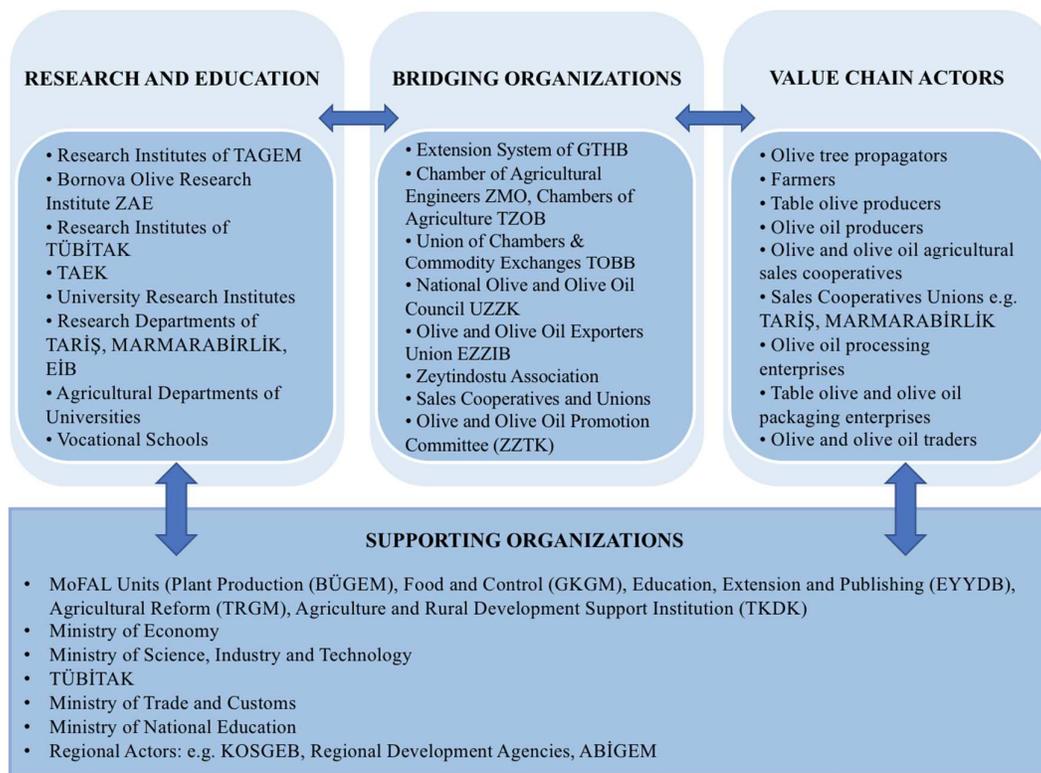


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### 6. Key Actors of Olive and Olive Oil

The key actors of olive and olive oil can be summarized as shown in the following diagram. This section draws from the article by Dr. Nilgün Pehlivan Gürkan written for a special issue of the “Olivae” magazine for Turkey<sup>6</sup>.



Source: Gürkan P., (2015), “Turkish Olive and Olive Oil Sectoral Innovation System: A Functional - Structural Analysis”. PhD Dissertation, Middle East Technical University (METU), Ankara, 2015

<sup>6</sup> Pehlivan Gürkan (2015) “Turkish Olive and Olive Oil Sectoral Innovation System: A Functional - Structural Analysis”. PhD Dissertation, Middle East Technical University (METU), Ankara, 2015. <http://etd.lib.metu.edu.tr/upload/12619517/index.pdf>



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### 6.1. Research and Education

Turkey has three key actors in food and agricultural research and education: public R&D institutions (Faculties of Agriculture and University Research Institutes), private sector, and NGOs.

Food and agriculture research, development, and training institutions are as follows: **TUBITAK** (The Scientific and Technological Research Council of Turkey) and **TUBITAK** and Marmara Research Centre (**MAM**) affiliated research institutes and laboratories, Sarayköy Nuclear Research and Training Centre (**SANAEM**) under Turkey Atomic Energy Agency (**TAEK**). Ankara Nuclear Research and Training Centre (**ANAEM**), and **Ankara Nuclear Agriculture and Livestock Research Centre (ANTHAM)** were reorganised as Sarayköy Nuclear Research and Training Centre (**SANAEM**) by the Decree of 13 June 2005 of the Council of Ministers published in the Official Gazette of 01.07.2005 issue 25862.

Studies carried out in the **Nuclear Techniques Department** aim to disseminate nuclear techniques in the fields of food, agriculture and livestock husbandry. The Department is working on the use of irradiation technology to eliminate or reduce microorganisms that cause disease in or spoil food and extend shelf-life. In the field of agriculture, these include the use of irradiation technology in mutation, genetic studies for the development of new plant varieties, and use of labelled fertilizer and neutrons in soil-plant nutrient-water relations to solve problems that are not possible with conventional techniques.

There are approximately **30 agriculture faculties, 38 food engineering departments, and 26 university research centres** that can engage in research and application in olive farming. In general, **30 colleges offer programmes on olive processing technology** in olive-grown regions. There are **17 industrial vocational and agricultural vocational colleges** located in olive-growing regions, with a sub-department of olive processing and **50 of them have a food technology programme**.

Within the framework of the **lifelong learning programme of the Ministry of National Education (MoNE)**, “Food Technology” training programmes are offered. By conducting surveys with the actors of the sector throughout the country, trends and needs are identified in the related branches of the profession. Processing and hygiene training is provided for employees at olive processing sites.

According to the January 2017 data of the **Ministry of Science, Industry and Technology**, the number of R&D centres in operation is 726, with 33 in the food sector. In 2016, the number of R&D centres operating in the private food sector was 8. There is no the centre that engages in R&D on the olive only.

In Edremit, an R&D company which has been processing olive and various plant extracts for 15 years, has produced olive coffee, prepared like Turkish coffee, but which has not yet been placed onto the market.



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*Agricultural Sales Cooperatives* and their unions, including particularly *Marmarabirlik*, have started important projects related to the production of environment-friendly olive and olive oil with government support and clean technologies. In addition, the internal R&D studies of the 1980s on local *olive processing technology providers* (such as HAUS, Polat Makina, Kahyaoglu) which have created gradual innovations in olive processing technologies in Turkey should be taken into consideration<sup>7</sup>.

There are 47 agricultural research institutes affiliated with *TAGEM* of the *Ministry of Food, Agriculture and Livestock (MoFAL)*. Twenty-three of them engage in research on garden plants, with only two engaging in research related to olive farming: *Bornova Olive Research Institute ZAE*, which has been operating since 1937, and *Hatay Olive Research Institute*, which was established in 2013. There are also food laboratories of MoFAL with research mandate.

### 6.2. Bridging Organisations

*The Public Agricultural Propagation System under the provincial organisations of MoFAL* is among the bridging organisations. The Public Agricultural Propagation System was established by a regulation published in the Official Gazette in 2006. This regulation was issued to lay down the principles and procedures concerning the timely and adequate fulfilment of the needs of agricultural enterprise owners in terms of knowledge, techniques and methods (8 September 2006 issue 26283). This regulation lays down the principles and procedures on strategy and programme development, guidance, encouragement, training, certification, defining duties and responsibilities, monitoring, evaluation, inspection and sanctioning in relation to the provision of agricultural propagation and consulting services by agricultural consulting companies and free-lance agricultural consultants, and the principles and procedures concerning farmer information activities in the context of commercial activity by organisations who receive from and provide input to agriculture.

In order to strengthen the research-propagation-farmer linkage, MoFAL takes precautions to ensure the necessary coordination between the institutions performing agricultural research, propagation, and training functions in order to communicate the problems of agricultural business owners to researchers, transfer the solutions and new technologies to agricultural business owners, and exchange information at the national, regional and provincial level.

Certification training is also organised in the training centres of the Ministry or in the training centres of the professional bodies which are allowed to issue certificate training by the Ministry, in order to equip propagators and consultants who will work in the agricultural propagation and consultancy system with the necessary professional qualifications for carrying out the related services. Certification training covers topics such as personal development and agricultural propagation methodology and requires at least 120 hours. The training is organised for groups of minimum 15 people and maximum 25 people. The examinations following the training are determined by the Ministry. Certificates are given to those who are successful in the examinations.

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<sup>7</sup> Pehlivan Gürkan 2015 p.217



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### ***General Directorate of Cooperatives under with the Ministry of Customs and Trade***

Established in 1956 and headquartered in Madrid, the International Olive Council (IOC) is an international organisation under the United Nations responsible for the International Agreement on Olive Oil and Table Olives since 1959. Turkey became a member of the Council for the first time on 06.28.1963 but left the Council on May 22, 1998. Within the framework of the demands from the sector, initiatives were initiated by the Ministry of Industry and Trade for the re-membership of Turkey to the International Olive Council in 2004. The Council carries out activities to develop international trade of olive and olive oil, increase consumption, estimate supply and demand, establish standards, take measures to prevent unfair competition in trade, develop projects, and organise courses and training on sectoral basis.

As a result of the works carried out by the Ministry of Foreign Affairs, with technical support from MoSIT, on completion of the domestic legal process for the ratification of the “International Agreement on Olive Oil and Table Olives (IA-OOTO) 2005”:

- Turkey's ratification of the “International Agreement on Olive Oil and Table Olives (IA-OOTO) 2005” was approved by the Law No. 5929 published in the Official Gazette of 10.12.2009 issue 27428 and entered into force.

- The Decree No. 2010/113 of 11.02.2010 of the Council of Ministers promulgated in the Official Gazette of 20.02.2010 issue 27499 that Turkey ratified IA-OOTO 2005 based on the Law No. 5929 on Ratification.

- The Spanish Ministry of Foreign Affairs reported to the Ministry of Foreign Affairs on 5 April 2010 that Turkey's membership was effective as of 21 February 2010.

- In addition, at a meeting held at the Ministry of Foreign Affairs on April 7, 2009 and attended by the Ministry of Agriculture and Rural Affairs and the Undersecretariat of Foreign Trade, it was decided that the coordination between the institutions be carried out by the Ministry of Industry and Trade.

The General Directorate of Organisation (General Directorate of Cooperatives) was authorised, by the Minister's Approval No. 10 of 10.06.2010 to discharge the following in accordance with the provisions of IA-OOTO 2005:

- Follow the fulfilment of Turkey's obligations,
- Coordinate institutions and organisations in Turkey,
- Execute correspondence with the Council,
- Provide secretariat services on other issues that may be related to IOC,
- Pay annual contributions to be re-calculated each year by the Council.

After Turkey became a member of IOC in 2010, Turkey started to work with IOC and hosted the "Extraordinary Session of the Council of Members" session in Istanbul in 2011, thus seizing the opportunity to promote the facilities for the Turkish olive. One of the contributions of the re-membership is the establishment of the “Third World Olive Gene Collection” in Izmir. The World Olive Collection, first founded in 1970 in Cordoba, Spain and second in 2002 in Marrakech, Morocco, ensures that the



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olive species in the world are collected to protect genetic resources. The collection project, which was named “Izmir Olive Collection”, started in 2012.

Olive farmers must be a member of the Association of Agricultural Chambers of Turkey (TZOB) in order to receive loans from Ziraat Bank and Agricultural Credit Cooperatives. When the activity reports on the Union's website were examined, there was no activity on olives. Most of the other activities are dated 2003-2004.

Tasks of TZOB include:

- Participate in events such as international exhibitions, fairs, meetings, seminars, panels, congresses,
- Be a member of similar international organisations and cooperate with agricultural organisations of these and other countries,
- Audit those chambers and companies in which chambers hold majority of shares,
- Organise local and/or general agricultural congresses in Turkey,
- Create training centres to train farmers, farming consultants, chamber staff and managers; prepare and present all kinds of training tools related to chambers and farmers,
- Establish or lease media such as newspapers, radio and television for agricultural training,
- Establish companies and foundations related to its purpose and duties, be a partner to the established companies.

The publication, training, congress or fair activities related to olive can be discussed with TZOB. There are olive producers' associations established since 2004. These associations are small scale and, as of 2014, there are 13 active olive producers' associations. The agricultural development cooperatives in the regions of olive farming are composed of olive farmers and act as an olive producers' association.

***National Council for Olive and Olive Oil (UZZK)*** is the first product council in Turkey established in 2007. It is a main bridging organisation in the sector. UZZK is an official platform that brings together public and private sectors, and NGOs to develop the olive and olive oil sector. Engaging in the activities published in the Official Gazette of 05.04.2007 issue 26484, UZZK reports to the Agricultural Support and Steering Committee. Its main activities are listed below:

- Bring together the value chain actors and MoFAL to formulate policies.
- Collect the data related to the sector and formulate a common strategy within the framework of the developments in olive and olive oil.
- Conduct research and analysis on olive and olive oil and related sectors at national and international level and transfer them to Council members and related persons and institutions. It cooperates with other organisations that have similar activities in other countries.
- Provide the information through periodic reports to the relevant units that make decisions on the olive and olive oil and related sectors and form public opinion.
- Conduct activities to improve the production, consumption and trade of olive and olive oil.
- Take emergency functional measures according to the circumstances related to the sectors concerned with olive and olive oil and monitor the results.
- Organise meetings, symposia, panels, seminars, conferences, congresses and workshops, promote olive and olive oil products and create working groups in order to participate in all



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these activities. Carry out training, propagation and consultancy services related to the sector.

- Contribute to the determination and implementation of the policies required for the realization of high quality production, standardisation and certification, market monitoring and development of quality control systems in the sector.
- Work to solve the structural problems of the sector, meet the needs of the sector and ensure the implementation of necessary measures including production planning and diversification of production in order to increase international competitiveness.
- Work to ensure the protection of the environment, public health, producer and consumer rights within the framework of production and industrial activities in the sector, identify and implement the necessary measures for rural development.
- Organise campaigns to promote the product and its consumption and do the necessary work, including participation in fairs.
- Help protect the industrial property rights in the sector and encourage branding.
- Work to inform olive and olive oil producers and consumers on organic farming and good agricultural practices, promote production and consumption.
- Engage in work to provide the balance of supply of olive and olive oil production, improve the quality of the product to ensure the competition in the country and abroad, place products in line with market standards, increase the marketing power of olive and olive and olive oil products on national and international scale, improve the continuity of olive and olive oil industry, profitability, trade, ensure that measures are taken to ensure the development of its consumption and standardisation and ensure that all segments of the sector agree on determining national policies.

UZZK is a platform that brings together value-chain actors, MoFAL and other relevant ministries to create the necessary policies.

UZZK is the corporate sponsor of the Olive, Olive Oil and Technology Fair (Olivetech) held in Izmir. It also supports the olive festivals in the regions where olives are grown. UZZK is also doing olive oil tasting training.

***Friends of Olive Association*** was founded in 2006 with the association of a sharing group formed in the internet environment. In addition to its consensus-building role, it has so far engaged in the following activities:

- Operator Course, Balikesir University Edremit Vocational College, 2015
- Training on Olive Plant Nutrition, Celal Bayar University Akhisar Vocational College Olive Processing Technology, 2015
- Training on table olive production at home, Olive Farming Research Station Engineer Şahnur IRMAK, 2015
- Training on olive oil tasting, 2015 and 2016
- Friends of Olive Boutique Olive Farmers Clustering: The objectives of this platform are to make public and bulk purchases for the purpose of promoting the market together, reduce costs. The Association also attaches importance to quality control. After the products of the boutique olive farmers have been checked by the quality control team of the Association, a quality label



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application will be started on the bottles. Member solidarity is also aimed; when the product is needed, members will be able to supply the products of similar taste and quality.

- “ZZ Mediterranean Culture” magazine has been published since 2006, with 36<sup>th</sup> issue released in December 2017.

*Chambers of commerce and industry, commodity exchanges* are actively linking value chain actors. In Turkey, there are a total of 252 chambers, including 181 Chambers of Commerce and Industry, 57 Chambers of Commerce, and 12 Chambers of Industry. Additionally, there are 2 Chambers of Maritime Commerce and 113 Commodity Exchanges. The umbrella organisation is the Union of Chambers and Commodity Exchanges of Turkey (TOBB) for 365 chambers and commodity exchanges. Chambers are established to meet the common needs of members, facilitate their professional activities, ensure that the profession develops in accordance with the general interests, and the members are ethical towards the public and consumers, and fulfil the duties assigned to the chambers and services written in their legislation. The chambers cooperate with the Small and Medium Enterprises Development and Support Administration (KOSGEB), work with other regional actors to provide training services to their members.

The aim of the *Olive and Olive Oil Promotion Committee (ZZTK)*, which was established on 3 April 2007, is to carry out promotion campaigns aimed at creating the brand and image of "Turkish olive and olive oil" by increasing efforts for and diversifying export markets. The aim of the Committee for domestic market is to promote consumer awareness in order to improve the market and increase consumption. The other objectives of the Committee are to provide a variety of products for the demands of global markets and expand market channels and implement sustainable price policy.

The mission of the committee is to:

- Tell the whole world that the motherland of the olive is Anatolia,
- Make Turkish olive and olive globally competitive,
- Make Turkish olive oil a global brand,
- Create preference for Turkish olive oil in the global market with high quality,
- Expand global market channels,
- Strengthen the position in the existing markets,
- Make and implement long-term plans,
- Carry out effective, targeted activities,
- Increase branded exports and contribute to the Turkish economy,
- Raise awareness of the consumer in the domestic market and ensure the increase of consumption,
- Increase product diversity by following global markets.

ZZTK attended the IFE London 2017 exhibition and introduced Turkish olive and olive oil with an information stand of 18 square metres. The IFE is held every two years and is the biggest and most important food fair in the United Kingdom.

ZZTK participated in the 2016/2017 season IN exhibition stands in Turkmenistan, India, United Arab Emirates, Iran, People's Republic of China, United States of America, Canada, Saudi Arabia, Japan, Italy, Germany, France and Russia. It continues its promotion activities in the domestic market with a



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budget increased from 10% to 20%. It participated in the Olivetech Fair in Izmir between 27-30 April 2016 and in harvest festivals held in Ayvalık between 4-6 November 2016 with an info-stand. These activities were carried out within the framework of previously approved budgets.<sup>8</sup>

Founded on 19 March 1940, the Aegean Olive and Olive Oil Exporters Union (EZZIB) is the only union exclusive for olive and olive oil. Its field of activity includes table olive, olive oil and olive pomace oil. The Union has approximately 500 members and the exporters of olive and olive oil have to be members of EZZIB. EZZIB and Aegean Exporters Union (AEU) are bridging institutions that play an important role in the industry, and operate under the umbrella organisation of Turkish Exporters Assembly (TIM). EZZIB, a part of EIB, acts as a bridge between public institutions, olive and olive oil exporters.

### 6.3. Value Chain Actors

There are three key chains of table olives and olive oil: olive farming, processing, and sales and marketing. Sapling growers are important actors in the selection of varieties suitable for climate and geography during the cultivation stage. It is important to take an inventory of saplings and grow “true-to-type/certified” olive saplings. Olive sapling growing in Turkey is undertaken by the public organisations and certified private organisations. The most important public institution that grows olive saplings is “*Edremit Olive Cultivation Station*” affiliated with MoFAL. The farmers obtain the saplings produced by both this station or by the private sector from the provincial and district directorates of MoFAL.

There are approximately 320,000 family businesses in olive and olive oil production (MoFAL 2015). 14% of these enterprises are made up of partners of *TARIS-Olive and Olive Oil Association*, *Güneydoğubirlik* and *Marmarabirlik*. TARIS-Olive and Olive Oil Association has 23,000 partners engaged in olive oil production; Southeast Union (Güneydogubirlik) has 5,000 and Marmarabirlik has 31,000 such partners.

*Kilis Organic Olive Producers’ Association* was founded on 6 May 2011 by olive producers who started organic farming under the name of “Kilis Central District Organic Olive Producers’ Association” and has approximately 300 partners. The olive oil processing, storage and packaging facility constructed on the Union land’ in Kocabeyli Village on behalf of the Union, was completed with a total budget of 3.2 million TL. This facility was a project implemented in partnership with the Governorship, Southeast Anatolia Project Regional Development Administration (GAP RDA), IKA, Provincial Directorate of MoFAL, UNDP and Kilis Organic Olive Producers’ Association. The first stage of the project was the olive processing facility which was constructed in cooperation with the Association of Organic Olive Producers in Kilis Province and Provincial Directorate of MoFAL, with financing support from IKA. The project cost for the olive processing facility was 500,000 TL and Kilis Organic Olive Producers’ Association contributed 224,000 TL. Within the scope of the project, machines were procured for 80 tonne/day capacity. The second stage of the project was the olive oil storage, packaging facility with a bottling capacity of 5,600 kg/h, with contributions and full-funding from GAP RDA and UNDP. Thus,

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<sup>8</sup> The Turkish Ministry of Economy, by the correspondence of 24 February 2017, stopped the additional prorate payment deductions in effect for all sectoral promotion groups; and on 14 March 2017, terminated the activities of all promotion groups.



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Kilis Organic Olive Producers' Association owns a fully integrated olive processing, storage and packaging facility.

***S.S TARIS Olive and Olive Oil Agricultural Sales Cooperative Association*** was organised in 1913. Around 28,000 olive producers in the Aegean Region established 31 olive and olive oil agriculture sales cooperatives in order to provide FOR their needs related to their professional activities through mutual assistance and solidarity, put their products into better use and protect their economic interests in line with Article 1 of Law No. 4572. These cooperatives came together to constitute the Union of Agricultural Sales Cooperatives of S.S TARIS Olive and Olive Oil.

**Marmarabirlik** (Marmara Union) was founded in 1954. Headquartered in Bursa, Marmarabirlik has 30,500 registered olive producers as members. The number of employees is 600. Marmarabirlik is among Turkey's strongest 500 industrial companies. Marmarabirlik does approximately 150 tonnes of olive packaging and produces 220 tonnes of olive oil per day with a closed area of 155,000 square metres and a storage and maturation capacity of 70,400 tonnes on 550 acres. Marmarabirlik buys and processes approximately 40-45% of the table black olive grown in its region and sells products through 58 dealers across Turkey, Germany, Denmark, Switzerland, Turkish Republic of Northern Cyprus, Bulgaria, and all of Europe, but mainly to USA, Canada and Australia. According to the report published in Banes Newspaper on 9 December 2017, Marmarabirlik will establish a production and storage facility in Cologne, Germany to increase the exports of table olives and olive oil to EU countries. They plan to receive funding from the German Development Agency for the production and warehouse facility to strengthen the branch office in Cologne. Marmarabirlik aims to become a global brand and increase the profits for its partners.

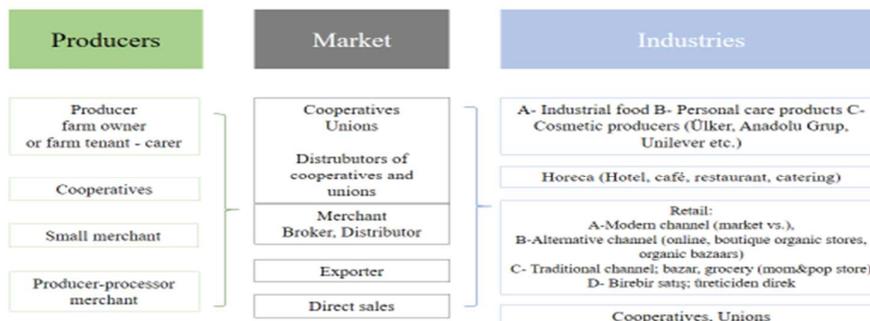
**Güneydoğubirlik** (Southeast Union), with 9 cooperatives comprising 17,000 producers, has lost its vitality; its activities have been suspended for a long time. The number of olive processing and packaging operations and the number of certified olive oil producers were last updated in 2006-2008. According to 2008 data, there are 481 olive processing and packaging enterprises and 1,794 certified olive oil producers (Turkish Grand National Assembly- TGNA - 2008 p.104). There are 1,005 olive oil manufactories (515 continuous, 102 super press and 580 hydraulic press systems), 100 olive oil bottling/boxing facilities and 478 table olive plants (ABGS 2006). Olive oil refineries and brining factories play an important role in the olive value chain in terms of zero waste disposal. There are 15 olive oil refineries (ABGS 2006) and 20 olive pomace oil factories using 14 classical and 6 decanter techniques (TGNA 2008 p.143).

Value chain actors are depicted in the following diagram. In Turkey, some actors in the olive and olive oil value chain operate at every stage of the value chain, such as producing, marketing and industry, or can undertake multiple functions at any given stage. Some actors are only producers, processors, traders, or exporters of olives, while some actors have some or all of these roles. For example, farmers undertake processing and marketing (making, processing and selling olives at home). Large food wholesalers can collect olives or oil from farmers or traders and process it and sell it to food giants. Olive producers in Turkey may assume the roles of individual traders/seller in the value chain by becoming members in cooperatives.



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#### 6.4. Regulatory and Supporting Organisations

Knowledge on regulatory and supporting organisations is important to identify potential stakeholders and aids for the projects that ILO will develop and implement. MoFAL and departments affiliated with the Ministry are effective in the regulations related to olive and olive oil. TAGEM determines the research priorities of the five-year agricultural research master plan and the research institutes related to olive and olive oil. TAGEM also provides R&D support. One of the latest communiqués of MoFAL concerning the olive oil published in the Official Gazette of 17.09.2017 issue 30183 provides that:

*... lays down the principles and procedures for designating institutions and organisations in charge, making support payments to farmers actually engaged in agricultural activities and soil analysis laboratories, as promulgated under the Decree on Agricultural Aids for 2017 put into effect by the Decree No.2017/10465 of 05.06.2017 of the Council of Ministers, for Diesel fuel for farm vehicles and Fertilizer Support, Soil Analysis Support, Organic Farming Support, Good Agricultural Practice Support, Turkey Agricultural Basin Gap Payments According to Production and Support Model Support, Support to Crop Producing Small Family Businesses, Hazelnut Field-Based Income Support, Forage Crops Support, Bombus Bees Support, Support for Using Domestic Certified Seed, Support for Using Certified Sapling/Seedling and Standard Sapling, Domestic Certified Seed Production Support, Certified Sapling Production Support, Rehabilitation Support for Traditional Olive Groves.*

The relevant units of MoFAL include the General Directorate of Plant Production (BUGEM), General Directorate of Food and Control (GKGM), General Directorate of Agricultural Reform (TRGM) and Agriculture and Rural Development Support Institute (ARDSI). These institutions make regulations and provide direct and indirect support to the olive and olive oil sector. In addition, GKGM sets food standards as well as the Codex standards of olive and olive oil.



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Units affiliated with the General Directorate of Plant Production (BUGEM):

- Department of Seeds (olive sapling support),
- Department of Field and Garden Plants (olive premium payments),
- Department of Plant Nutrition and Technology Development (diesel fuel for farm vehicles, fertilizer and soil analysis support),
- Department of Agricultural Good Practices and Organic Agriculture (organic farming support),
- Department of Meadow Pasture and Forage Crops,
- Department of Agricultural Basins and Department of Administrative Affairs and Coordination (prioritization of products according to basins).

A significant part of the agricultural support is administered by the units of BUGEM: Department of Seeds is responsible for olive grove support; Department of Field and Garden Plants provides the olive premium payments to farmers; Department of Plant Nutrition and Technology supports diesel fuel for farm vehicles, fertilizer, and soil analysis; Department of Good Agricultural Practices and Organic Agriculture supports efficient and organic farming; and Department of Agricultural Basins supports the prioritization and support of agricultural products including olive according to their basin.

Cooperatives play an important role in the sector. TRGM of MoFAL is in charge of regulating agricultural producers’ associations, development cooperatives, irrigation cooperatives, and agricultural credit cooperatives. The number of cooperatives and unions affiliated with MoFAL is given in the following table:

Cooperatives by type and number of partners	Cooperative		Union		Central Union	
	Number of partners	Number of members	Number of Joint Cooperatives	Number of members	Number of Unions	Number of members
Agricultural Development Coop.	8,173	842,563	82	4,939	4	77
Irrigation Coop.	2,497	295,984	13	733	1	10
Agricultural Credit Coop.	1,767	1,082,978	16	1,767	1	16
<b>Total</b>	<b>12,437</b>	<b>2,221,525</b>	<b>111</b>	<b>7,439</b>	<b>6</b>	<b>103</b>

Source: T.R. Ministry of Food, Agriculture and Livestock, General Directorate of Cooperatives  
<https://koop.gtb.gov.tr/kooperatifler-hakkinda/turkiyede-kooperatifcilik>

Agricultural sales cooperatives and associations (S.S. TARIS, Marmarabirlik) are under the responsibility of the Ministry of Customs and Trade. The cooperativism strategy and action plan implemented by the Ministry of Customs and Trade in 2014 and the redesign of the articles of association of TARIS and Marmarabirlik considerably transformed the functioning of unions. By amendments in 2013 to the Law No. 4672 and new articles of association taking effect in 2014, inactive partners were delisted. In addition to the restructuring of debts through amendments in legislation and articles of association, measures were taken to strengthen the unions administratively and financially. Audit boards, no longer effective, were altogether abolished and independent external audit was introduced to improve professional and corporate governance.



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The Turkish Standards Institute (TSE) (culinary olive oil standard in foreign trade) and Turkish Patent and Trademark Institute (TURKPATENT) (geographical signs in food products) are among the main institutions that regulate the olive oil and olive oil sector.

In addition, regional development agencies such as Dogaka and Ipekyolu (Silk Road), KOSGEB Regional Directorates, rural development agencies of the Agriculture and Rural Development Support Institute (ARDSI), local European Union Business Development Centres (ABIGEMs) formed TOBB, are some of the regional actors contributing to the development of the financial, physical and human resources regional infrastructure of the olive and olive oil sector. The basic government plans and programmes related to the olive and olive oil sector are given in the following table:

Programme	Year	Coordinator
Agricultural Research Master Plan*	2011-2015	MoFAL
Rural Development Investment Support Programme*	2011-2015	MoFAL
National Food R&D and Innovation Strategy	2011-2016	TUBITAK
Organic Agriculture Strategic Plan	2012-2016	MoFAL
Input Supply Strategy (GITES) Agricultural Action Plan	2013-2015	Ministry of Economy
MoFAL Strategic Plan	2013-2017	MoFAL
UGTP Strategic Research and Innovation Agenda 'Vision 2023'	2013-2023	National Food Technology Platform (UGTP)
Pre-Accession Economic Programme	2014-2016	Ministry for EU Affairs
Tenth Development Plan	2014-2018	Ministry of Development
National Strategy for Regional Development	2014-2023	Ministry of Development
National Basin Management Strategy	2014-2023	Ministry of Forestry and Water Affairs
Medium-Term Programme	2015-2017	Ministry of Development
Industry Strategy Document	2015-2018	MoSIT

Source: Olivae issue 123, Dr. Nilgün Pehlivan Gürkan's article

<http://koop.gtb.gov.tr/data/58244e541a79f57caca402ad/OLIVAE%20Eylül%202016%20Türkçe%20Versiyon.pdf>



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Supporting Organisation	Support Type
<b>MoFAL</b>	TAGEM research institutes project support, public-private sector cooperation in kind support to R&D projects, support of university, NGO, private sector R&D projects.
	Subsidies for fertilizer, diesel fuel for farm vehicles, organic production, good agricultural support, olive production for olive oil basin, premium support, olive support, agricultural insurance support, agricultural credit support for cooperatives
<b>TUBITAK</b>	Research support programme, technology and innovation support programme, academy and industrial R&D support
	Commercialization of R&D through University-Industry Cooperation development and Technology Transfer Office (TTO) support programme
<b>MoSIT</b>	SANTEZ programme: Partial cash grant to university-industry R&D business association, cluster support to regional actors project cooperation, technology development zones tax exemption support
<b>Ministry of Customs and Trade</b>	Cooperative thesis award, cooperative project support
<b>Ministry of Economy</b>	Support for the development of international competitiveness (URGE) programme; support for the cooperation projects of bridging institutions such as NGOs, cooperatives, chambers of commerce and SMEs to develop external markets
	Market research and market entry support, overseas unit, brand and promotion support, international competitiveness support, exhibition participation support, branding and Turquality support, export refund in agricultural products (including olive oil)
<b>Ministry of Finance</b>	Technology centre, R&D centre, pre-competition cooperation projects etc. R&D allowance, income tax withholding incentive, social security premium support
<b>KOSGEB</b>	Entrepreneurship support, thematic project support, general support, SME development support, R&D, innovation, industrial implementation support, SME project support, loan interest support,
<b>Technology Development Foundation of Turkey (TTGV)</b>	Support for advanced technology projects: food technology, partial cash support for biotech R&D projects from agricultural waste.
<b>Credit Guarantee Fund (KGF)</b>	Guarantees for bank loans to SMEs, young people and women entrepreneurs
<b>Regional Development Agencies</b>	Various Support
<b>ARDSI</b>	IPARD* Supports: for farmers and cooperatives registered in the farmer registration system.

Source: Olivae issue 123 Dr. Nilgün Pehlivan's article

<http://koop.gtb.gov.tr/data/58244e541a79f57caca402ad/OLIVAE%20Eylül%202016%20Türkçe%20Versiyon.pdf>

\* Rural development component of the Instrument for Pre-Accession Assistance (IPA), created by the European Union (EU) to support candidate and potential candidate countries.



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### 7. Harvest and Olive Processing Systems

#### 7.1. Factors Determining the Quality of Olive and Olive Oil

The quality and yield of olive oil depend primarily on soil and saplings. Other factors affecting the quality of olive oil include climatic conditions, “true-to-type/certified” olive plants, soil treatment, nutrition of soil, growing, irrigation, harvesting time, harvesting method, oil extraction process, storage conditions, and consumption style.<sup>9</sup>

Factors Determining the Quality of Olive and Olive Oil



**Saplings:** It is important to select saplings adaptable to the region and suitable for purpose (olive for table, olive for oil etc.). Irrigation and soil care need to be done according to the type of saplings and soil. Irrigation is increasing every year, leading to increased yields; but in most places the ground water level has dropped from 50 m to 150-180 m.

In the 2000s, the saplings planted with incentives were not suitable for the region and the need for irrigation was higher than for other saplings in the region. Moreover, since the introduction of these saplings, harmful flies such as olive fruit flies, have increased. It is widely believed in the region that it is necessary to increase the use of pesticides, or the number of useful insects such as ladybugs which eliminate harmful insects naturally. On the other hand, the Gemlik olive plant yields almost 40-60% each year and increases its yield with irrigation. It is also suitable for table olive because the fruits are larger.

<sup>9</sup> Source: One-on-one in-depth interviews, focus groups

Olive Oil, Eflatun Yayınevi. Eds: Fahrettin Göğüş, Mujahid Taha Özkaya, Semih Ötleşme  
2016-2017 Production Season Olive And Olive Oil Harvest National Official Assessment Report, UZZK.



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### *Olive*

***Olive ripening:*** The region harvests early or late due to the adverse weather conditions and a lack of workers to pick olives. After the crop is collected, it is mostly kept in plastic bags almost until it releases blackwater; and with the onset of warming, olives start to deteriorate.



Photo: Nurhan Keeler, Kilis, November 2017

***Harvesting:*** To obtain olive oil, the most accurate harvest time is when the fruit is holding highest levels of oil. Experts are of the opinion that this corresponds to early harvest, while the general trend with olive farmers is to harvest after at least one round of rains. The belief is widespread among olive farmers that olives exposed to rain store higher oil.



Photo: Nurhan Keeler, Şahinbey, November 2017

The harvesting of olive fruit should be done carefully to avoid damaging the tree and prevent deterioration of olive oil chemistry. Since yield is generally low due to climatic conditions, care should



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be taken to avoid breaking shoots and sprouts during harvest which will yield next year or help develop trees, and appropriate harvesting methods (manual or mechanical) should be preferred.

It is emphasised that the quality of olives that already fell on the ground and that of olives in the upper branches are different, so they need to be collected in separate cases and processed separately.



Photo: Nurhan Keeler, Şahinbey, November 2017

### *Olive Oil*

***Olive processing:*** Pressing olives on the same day or the day immediately after harvest, if possible, increases the quality of the product. Natural olive oil is obtained by mechanical or physical processes at a temperature that does not degrade the natural properties of olives. The general belief in the region is to use 40-45 degrees of water temperature, rather than 25 degrees, at the time of pressing because more oil can be obtained. However, higher heat degrades olive oil texture and aroma.

As shown in the following photograph, most farmers want the heat at 39-40 degrees, even if the processor is opposed. The fact that the processor favours cold pressing is misunderstood by farmers, resulting in comments that the processor only wants lower temperatures to reduce electricity costs. On this misconception, farmers need to be convinced otherwise by the officials or influential persons.



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Photo: Nurhan Keeler, Kilis, November 2017

**Storage:** Olive oil should be stored in dark-coloured bottles, pottery or lacquered tin cans away from sunlight. The use of unlabelled and non-lacquered “white tin can”<sup>10</sup> is widespread in the region.



Photo: Nurhan Keeler, Kilis, November 2017

**Marketing:** The inadequacy of packaging and ‘traceability’ (tracking from seed to olive oil) also adversely affects marketing. Olive and olive oil are generally marketed as bulk and non-branded. Many people in the region (such as tailors, barbers, butchers, civil servants) buy a field with their small capital; cultivate the fields, grow and harvest olives, and then take them to pressing facilities to obtain the olive oil needed for their households. They also sell 3 to 5 tin cans of home-made oil in front of their workplaces. The interviewees complain that everybody is an olive oil trader. This leads to a disorganised market and allows all kinds of goods into the market. The lack of inspection further facilitates adulteration.

<sup>10</sup> Olive oil is usually packaged in tin cans of various volumes, most common ones being 2-, 5-, 10- and 18-litre cans. White tin can means “no label or brand name” on the can. [Bunu ben ekledim; yanlış veya yersizse kaldırın].



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### 7.2. Olive Preparation Operations

The operations before the oil separation process after harvest are summarized as follows:

#### OLIVE PREPARATION

The operations before the oil separation process after harvest are summarized as follows

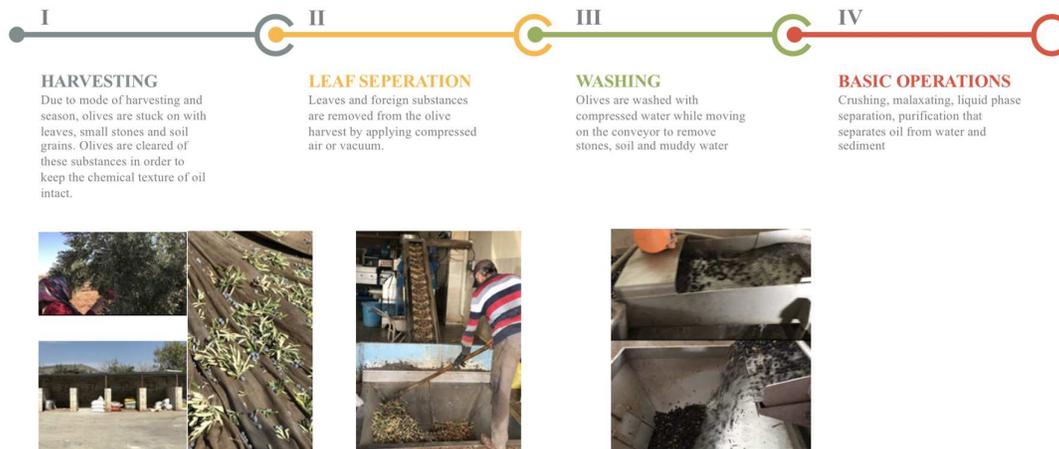


Photo: Nurhan Keeler, November 2017, Kilis

**Harvesting:** Due to mode of harvesting and season, olives are stuck on with leaves, small stones and soil grains. Harvesting manually using a rake affects the product in subsequent years. Olives are cleared of these substances in order to keep the chemical texture of oil intact.



Photo: Nurhan Keeler, November 2017, Kilis



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**Leaf separation:** It is necessary to wash olives and remove the leaves if present before olives are crushed and pressed. Leaves and foreign substances are removed from the olive harvest by applying compressed air or vacuum. Separated leaves are usually collected in a pile in the open area and used as fuel. However, these leaves can be converted into high value-added products such as tea or coffee.



Photo: Nurhan Keeler, November 2017, Kilis

**Washing:** Olives are washed with compressed water while moving on the conveyor to remove stones, soil and muddy water.

**Basic Operations:** These include crushing, malaxating, liquid phase separation, purification that separates oil from water and sediment.

### 7.3. Basic Operations in Obtaining Olive Oil

The basic operations for obtaining olive oil are summarized in the following diagram: crushing, malaxating, liquid phase separation, purification that separates oil from water and sediment.<sup>11</sup>

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<sup>11</sup> Source: One-on-one in-depth interviews, focus groups; and Olive Oil, Eflatun Yayınevi, 2009, Eds: Fahrettin Gögüş, Mujahid Taha Özkaya, Semih Ötleş.



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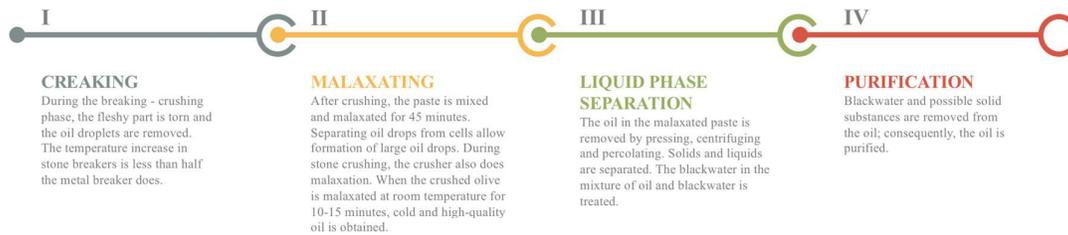


Photo: Nurhan Keeler, November 2017, Kilis

**Crushing:** Called also “breaking”, the purpose of crushing is to tear the fleshy part (mesocarp) to facilitate the release of the oil from the vacuoles. This step can be done with stone mills, metal tooth grinders, or various kinds of hammer mills. With this technique, it is possible to obtain the best paste. The crushing is carried out by rotating blades at high speed (3000 rpm). Blades finely cut olives and force them to pass through small holes. The olives undergoing this operation are led to the malaxating process.

**Malaxating:** After crushing, the paste from the hammer mill is mixed and malaxated for 45 minutes. Separating oil drops from cells allow formation of large oil drops. During stone crushing, the crusher also does malaxation. When the crushed olive is malaxated at room temperature for 10-15 minutes, cold and high-quality oil is obtained.

**Liquid Phase Separation** (separating oil from plant juice and pomace): Liquid Phase Separation refers to obtaining oil from the lives in the form of paste. Plant juice, pomace and oil are separated in the decanter. Separation is based on the principle of centrifugal force. High revolutionary speeds of the unit (3,200 to 4,200 rpm) forms three separate layers in the unit. The outermost layer comprises pomace, the second layer is plant juice, and the third layer is olive oil.

**Purification:** Blackwater and possible solid substances are removed from the oil; consequently, the oil is purified.

**Oil Storage:** The oil from the decanter is led to the sedimentation tank to settle for several days.

#### 7.4. By-Products Obtained from Olive Oil

**Olive pomace** is the pulp used as fertilizer or animal feed that does not lose its richness in terms of oil content after the application of the physical processes of olives. It is the most important by-product of olives because of its oil and dry pulp and can be produced in large quantities at low cost. The commercial value of the product depends on the amount of oil and water content.



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In fact, olive pomace is a waste of olive oil factories; it is an important type of biomass seen in Mediterranean countries and can cause problems if it does not have a suitable and acceptable use. Vegetable oils and olive pomace can be considered as alternative fuels (renewable energy) that do not contain sulphur. The efficient and proper use of olive pomace in energy generation provides multiple solutions to two problems: clean energy generation and re-use of a refuse matter from olive oil facilities.

The objective of the production of olive pomace oil is to produce high quality edible oil; however, olive pomace is used in cosmetics because it is not in compliance with the Turkish Food Codex standards. The most important product obtained from the olive pomace is the olive pomace oil which used in the cosmetics and soap industry. The high level of water content in the olive pomace leads to increased free fat acidity and affects the quality of products such as cosmetics, soap. Olive pomace is also used in the production of animal feed, fertilizer, biogas, activated carbon and phenolic compounds.



Photo: Nurhan Keeler, olive pomace pile, Kilis, November 2017

In all oil production processes, the oil obtained is 20%; another 30% is solid matter (pomace), and 50% water content is waste. Olive blackwater is a serious source of pollution. Since the end of 1980s, water has not been used in the production process and a two-phase system has been introduced to separate olive juice from pomace. In Turkey, 3-phase systems are commonly used. Large companies and cooperatives prefer an integrated two-phase system to treat wet pomace in their own olive pomace facilities and produce the clean water and electricity needed by the factory.

The blackwater from 8 to 10 enterprises may be collected in a special treatment facility to treat the water with advanced technology and recover the polyphenols in the blackwater. High value-added products such as microalgae oil, animal feed, and fertilizers can be obtained.<sup>12</sup>

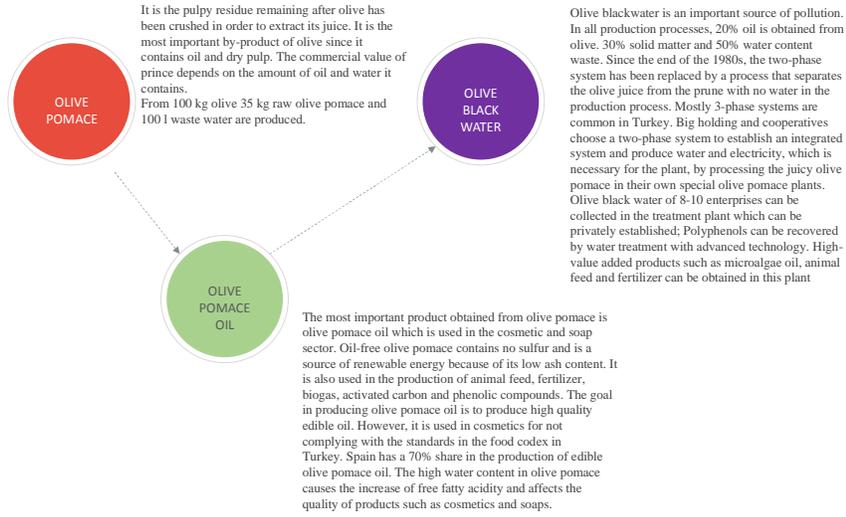
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<sup>12</sup> Source: Olive Oil, Eflatun Yayınevi, 2009. Eds: Fahrettin Göğüş, Mücahit Taha Özkaya, Semih Ötleş



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Source: Olive Oil / Fahrettin Göğüş, Mücahit Taha Özkaya, Semih Ötles



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8. Project Recommendations and Evaluation Criteria for Olive Value Chain

When evaluating the sector, Value Creation Analysis was used instead of SWOT Analysis. This analysis is preferred because it fits better with ILO's economic, social, environmental and institutional criteria.

The data obtained from the one-on-one interviews and focus groups held in November 2017 in Gaziantep and Kilis, and the outputs from literature review and desk study are grouped according to the following two parameters:

I – Products, processes and operations that do not create value in the sector, which will reduce costs if discontinued or reduced (green triangle in the following figure)

II- Areas in which the sector can create more value and innovate (red triangle in the following figure).

These two parameters are charted against ILO’s economic, social, environmental and institutional criteria (boxes in the following figure):

<p><b>Economic dimension:</b></p> <ul style="list-style-type: none"> <li>• Market and Entrepreneurs (+/-) growth trends</li> <li>• Sector's ability to create value added</li> <li>• Innovation approach</li> </ul>	<p><b>Social dimension:</b></p> <ul style="list-style-type: none"> <li>• Gender equality, prioritizing employment of women and young people</li> <li>• Identify barriers to employment and entrepreneurship</li> <li>• Prevent child labour</li> </ul>
<p><b>Environmental dimension:</b></p> <ul style="list-style-type: none"> <li>• Use of natural resources (water, energy etc.) and natural materials</li> <li>• Impact of production on the environment</li> <li>• Energy use, carbon emissions, carbon footprint</li> </ul>	<p><b>Institutional dimension:</b></p> <ul style="list-style-type: none"> <li>• Whether sector players are ready to act in concert</li> <li>• Whether they accept a win-win philosophy against competitors, suppliers, employees and customers</li> <li>• Whether they are experienced and competent for projects to be developed</li> <li>• Official and legal obstacles</li> <li>• Institutions with which they are ready to cooperate</li> </ul>

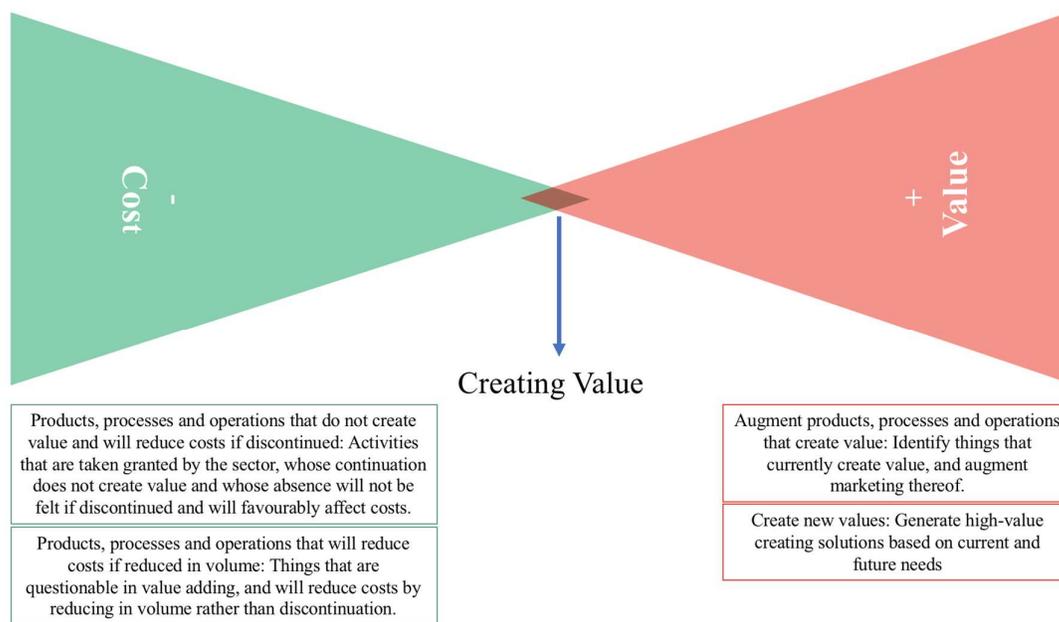


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Value Creation Analysis

The two parameters of creating value are further divided into two:



**Minus (-) Cost Parameter (cost reduction):**

- a) Products, processes and operations that do not create value and will reduce costs if discontinued: Activities that are taken granted by the sector, whose continuation does not create value and whose absence will not be felt if discontinued and will favourably affect costs.
- b) Products, processes and operations that will reduce costs if reduced in volume: Things that are questionable in value adding, and will reduce costs by reducing in volume rather than discontinuation.

**Plus (+) Value Parameter:**

- c) Augment products, processes and operations that create value: Identify things that currently create value, and augment marketing thereof.
- d) Create new values: Generate high-value creating solutions based on current and future needs

**8.1. Products, Processes and Operations that Do Not Create Value and Will Reduce Costs If Discontinued**

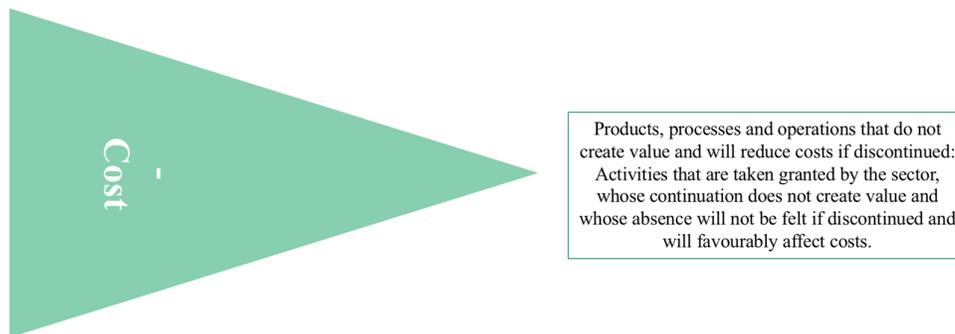
a) This area includes issues that bring costs to the sector, do not add value, or even cause damage. The sector cannot continue these operations on accounts of habits, intensity of daily operations, majority being engaged in these practices, or current agricultural policies. The pioneers or common sense in the sector must say 'stop' to these practices.



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As grouped according to ILO's **economic**, **social**, **environmental** and **institutional** criteria; products, processes and operations that do not create value and will reduce costs if discontinued are listed below.



#### **Economic Dimension**

1. Alternans in olive farming has high impact in the region: As a tree is aged, wood content increases, product quality decreases, and alternans increases. This is due to both climate change and inadequacy of cultivation practices (nutrition, irrigation, pruning, time and mode of harvest etc.). To remedy such inadequacy, the gap in information and technology needs to be closed. Olive groves switched from sparse planting to dense planting; therefore, there are more olive trees than before. This requires more irrigation. In addition, Gemlik and Ayvalık varieties of saplings were planted next to traditional saplings indigenous to the region. In particular, Gemlik gives 40-60% yield each year and suitable for brining. However, Gemlik and Ayvalık varieties of saplings require water. It is important to determine the water requirement, raise the farmer's awareness and develop irrigation projects.

#### **Social Dimension**

2. The reduction in supply of agricultural workers is attributed to the “social assistance programmes” implemented by the General Directorate of Social Assistance, Ministry of Family and Social Policies (including but not limited to cash aid, in-kind aid of fuel-coal, education aid, conditional education and medical aid, salary for people with disabilities, pension for senior citizens beyond 65, aid to widow women, aid to soldiers’ families in need etc.). The disappearance of agricultural labour causes the disappearance of agricultural lands. In different projects (Maraş Pepper Clustering- EU Project, Rize Tea Promotion Project etc.) similar problems have been encountered. Problems such as labour shortage, lack of capital, and lack of incentives cause the farmers to shy away from production, which ultimately causes land dispossession. The lack of production causes an increase in imported products and weakening of the self-sufficiency economy. On the other hand, TURKSTAT data show that the rate of unemployment for the population aged 15 and above was 10.3% in October 2017 in Turkey. In the same period, the rate of non-agricultural unemployment was estimated at 12.3%. In the young population (15-24 years) the unemployment rate was 19.3%, while in the 15-64 age group this rate was 10.5%.



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#### **Environmental Dimension**

3. During harvest, damage to shoots and sprouts should be avoided. The increase in capacity and the birch method to collect olives in high branches damages the branches that will shoot in subsequent years, resulting in lower yield. Harvesting can be done by hand-picking or with soft combs specially designed to increase the mechanical harvest capacity. It is also possible to reach high branches with tripod ladders.

4. No saplings unsuitable for the region should be planted. Saplings must be selected according to resistance to soil and adverse climatic conditions, resilience against diseases and pests, suitability for early yield, and mechanical harvest. Planting mode and density of saplings are also important. For traditional farming, density is less than 10 trees per decare whereas it is possible to plant 30 trees per decare where rainfall is above 700 mm.

5. Olive is known as a dry (arid) plant which under normal circumstances suffices with rainwater. Only approximately 10% of olive trees in the world are irrigated (Olive Oil, Eflatun Yayinevi, 2009 p.21). In autumn and winter, water is stored in the soil and is used in the development of both shoots and branches. In April and May, the formation of inflorescence and flowering occurs even when there is a low amount of water. In June, if the water is insufficient during the fruiting, the tree drops the fruits it cannot feed. In the case of olives for oil, oil formation is most yielding in October and November. Both quantity and quality increase under sufficient humidity. Studies have shown that savings are obtained with drip irrigation and yield is increased. It is found that the most effective irrigation is in the period two weeks before harvest. In June-July when kernels become hardened, non-irrigation increases the ratio of flesh (mesocarp) to kernel (stone). Climate change, drought, dams etc. reduced ground water, even making it unreachable in some places. As a result, irrigation projects are needed. As the need for pressurized water increases, electricity consumption for irrigation also increases. In line with climate action, there is need for correct irrigation projects and natural energy resources for drilling instead of electric power.

#### **Institutional Dimension**

6. Processes above 25 degrees degrade oil texture and aroma. Manufacturers should be trained in hot pressing for they generally prefer pressing at 40 degrees. Processing facility owners are unable to convince farmers to adopt pressing in cold or low temperatures. When olive processing facilities insist on cold pressing, their insistence is perceived by farmers as avoiding electricity consumption.

7. The sale of products that are non-branded, non-labelled, and with dubious food safety, called “white tin can”, should be stopped. Sales of olive oil at barber shops, roadsides, etc. should be regulated and certified.

#### **8.2. Products, Processes and Operations that Do Not Create Value and Will Reduce Costs If Reduced in Volume**

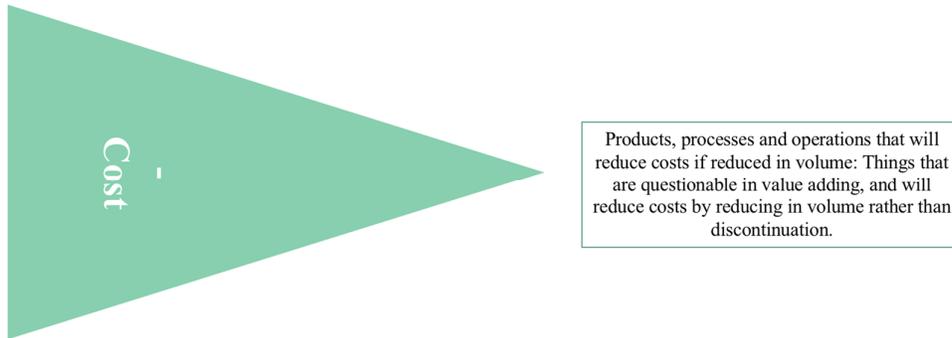
b) Areas that contribute to the sector and the region but do not add much value in terms of costs may be identified and reduced instead of being discontinued completely.

As grouped according to ILO's **economic**, **social**, **environmental** and **institutional** criteria; products, processes and operations that are questionable value adding and will reduce costs if reduced in volume are listed below.



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#### **Economic Dimension**

1. Gemlik varieties of trees give fruit if irrigated from the year they are planted. These trees give up to 60% fruit each year. Other saplings that are not well-yielding should be reduced by doing inventory work.

2. Galvanized, sheet and plastic containers should not be used during or after harvest. The use of plastic or fabric bags in harvest should be reduced. Olives should be processed as soon as they are collected because olives lose humidity if kept unprocessed. For every 100 kg of olives that are pressed, 25 kg of oil is obtained, regardless of whether it has been taken immediately after harvest or stored for 20 to 30 days. This leads farmers to hold a misconception that holding does not adversely affect yield. This however causes fresh olives to be kept in bad conditions where quality degrades over time. Thus, high-quality olives are made inferior by human intervention.

#### **Institutional Dimension**

3. While the price of 1 tin can of olive oil is around 300 TL, the laboratory fee is 180 TL. Making the laboratory price affordable and even free of charge will increase the number of analyses. This will be an important step in preventing adulteration (i.e. producing food items and substances/materials in contact with food in specifications not compliant with the regulations or authorised specifications).



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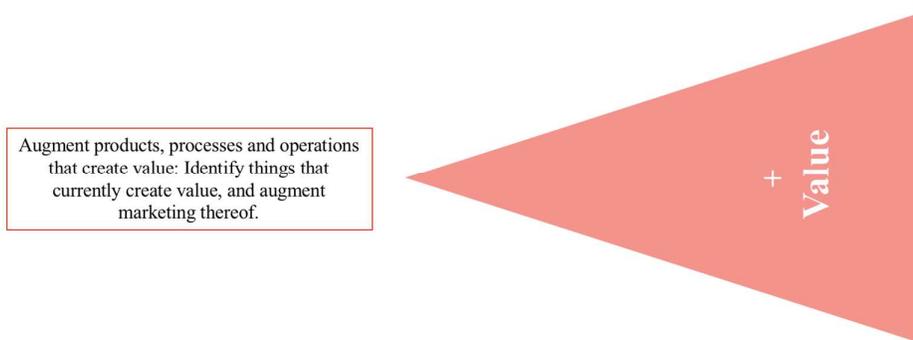
A summary of the items above is given in the following table:

a) Discontinue: Products, processes and operations that do not create value and if it is not done, it will not be perceived and will affect the cost positively.	b) Reduce: Products, processes and operations that are questionable in value adding, and will reduce costs by reducing in volume rather than discontinuation
1. Abandon the beliefs and attitudes that irrigation is not needed, incorrect pruning or harvesting and similar practices; implement irrigation projects.	1. Reduce the number of saplings that are not well-yielding by making an inventory study.
2. Investigate reasons for decrease in supply of agricultural labour, and formulate policies to prevent.	2. Reduce the use of plastic or fabric bags in harvest, or process olives as soon as collected.
3. Prevent harvesting modes that damage shoots and sprouts.	3. Rearrange fees for laboratory analyses on the basis of the price of 1 tin can of olive oil
4. Raise awareness of climate change, prevent drilling and dam building.	
5. Prevent planting of saplings unsuitable for the region.	
6. No pressing over 25 degrees (cold press preferable)	
7. Stop the sales of products that are non-branded, non-labelled, and with dubious food safety, called “white tin can”.	

**8.3. Augmenting Products, Processes and Operations that Create Value**

c) This section covers the products, processes and operations that create value. It is necessary to augment some practices and products in order to increase value in the sector (correct sapling, adequate irrigation, etc.).

As grouped according to ILO's **economic**, **social**, **environmental** and **institutional** criteria; products, processes and operations that create value and need to be augmented are listed below.



**Economic Dimension**

*1. Crop estimation studies* are based on observation or with a small sample. For accurate and reliable information, it is recommended that trees be tagged and counted with the assistance of a public engineer, and that wide sample areas be used in the counting process.



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#### **Social Dimension**

2. More women can be employed in *stamp printing and packaging* in soap factories or workshops. In the factories that were visited in Nizip, men mostly worked in production whereas women worked in quality control, packaging and stamping. It is possible to create more jobs in this area.

#### **Institutional Dimension**

3. Each factory needs at least 1 or 2 machine operators, namely technicians. The necessary number of operators can be increased with training. In the interviews and focus group meetings, it was stated that around 70% of the factories had a demand for this. It was underlined that the operator would be suitable also for women. Moreover, women were considered more stable and reliable. The operator is not a heavy job but a job that requires care and attention. Although the operator seems to be working only two months in a year, after the olive harvest, this line of work can be continued in other months with the production of brine and saplings projects over the next few months. It is also noted that the earnings per month of good operators correspond to the annual minimum wage.

4. Olives should be harvested into cases instead of plastic sacks or bags and olives should be kept ventilated in these cases until processing. *Since the quality of olives on the ground is different than that of olives on the branch, keeping them in different coloured cases and separating olives will increase quality.*

5. *Increasing the number of packaged – branded products* will increase value to the sector. Although there is intensive production in olive oil, the packaged – branded products are almost nil. This shows that the products have unreliable quality, which causes the quality products to become worthless along with the poor ones.

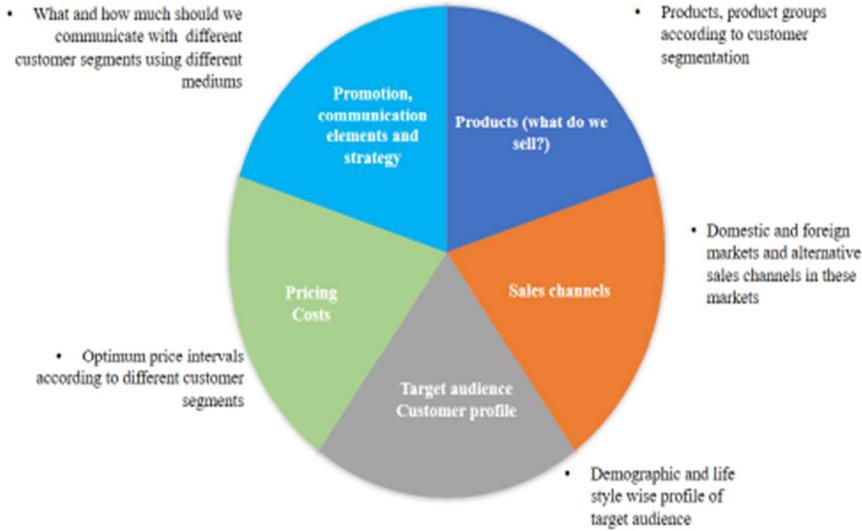
6. *Marketing strategy* ensures business development and long-term planning. Learning and implementing the marketing strategy will make the sector valuable. Work must be undertaken in the sector for brand architecture, brand positioning, 4Ps of marketing (product, price, promotion, and placement). In order to engage in marketing activities, it is necessary to define the product (e.g. olive for oil, olive for table etc.), sub-segments for products (e.g. virgin olive oil, high quality table olive etc.), and identify target markets and customers. The price will be set on the basis of products, production process, and customer base/profile and sales channels.



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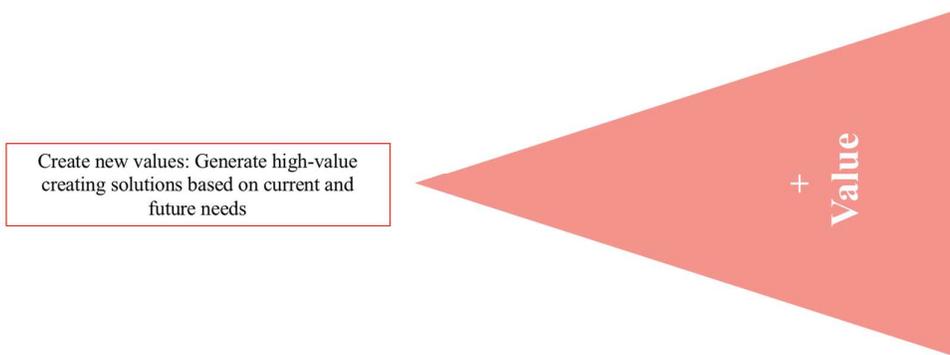
MARKETING ACTIVITIES



8.4. Creating New Values

d) The realization of new/innovative products, processes and operations will increase the value of the sector.

As grouped according to ILO's economic, social, environmental and institutional criteria; products, processes and operations that are new and create value are listed below.



Economic Dimension

1. In the growing of saplings, suitability for the region/suitability (insitu)/climate-resilient selection is important. It is necessary to encourage the planting of saplings belonging to their place and true-to-type, and to carry out the regional inventory work. Certified sapling growth should be encouraged for the true-to-type.



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2. Experts agree that 100,000 saplings “suitable for the region”, “true-to-type/certified”, and “well-yielding” be planted in the pilot area. The sapling project will contribute to further employment because it is not seasonal, and because nurseries require continuous care. Most of the Syrians living in the region are of rural origin, so they are predisposed to farming and willing to work with the land. Sapling growing can be targeted in the framework of scientific organic diversity.

3. The establishment of a facility in Gaziantep, Nizip, and Kilis for *brined olives* obtained from new saplings and traditional olive trees will increase the value of the sector. At least 10 tanks of brined olive investment are required in each region. Women workers are required to work in salting, ventilation, sieving and selecting, and packaging of olives. There is no seasonality in the brining facility.

4. The Olive Research and Development Centre is needed to keep the units in the value chain together and conduct scientific research and follow up on developments. The establishment of such a centre can also be pioneered. One such research centre is located in Izmir and another in Hatay. The centre in Hatay can be observed for its geographical proximity.

#### **Environmental Dimension**

5. Electricity is used in irrigation, water drilling and olive processing, and electricity costs are increasing steadily. It is important to increase the use of renewable energy sources such as *solar panels to reduce electricity costs*. In India, Bare Foot College teaches women from Africa to build, install, and repair panels. Thus, women who return to their villages are able to establish their natural energy sources in their villages.<sup>13</sup>

#### **Institutional Dimension**

6. Olive oil must be stocked in stainless steel containers for healthy storage. A *licensed warehousing project* should be established in this respect. Licensed warehousing is a practice where agricultural products are stored in healthy conditions and according to the quality classes; and product is priced according to quality classes under free competition conditions. The government determines the minimum requirements for licensed warehouses. These warehouses, which provide long-term and healthy durability of agricultural products, allow manufacturers to find buyers for their products at value without worrying about deterioration.

7. *Establishing a cooperative and an integrated facility* through which the blackwater can be treated to recover remaining polyphenols using advanced technology. High-value added products can be obtained in the form of microalgae oil, animal feed and fertilizers. It is also intended to make soap from olive pomace oil in this facility. The quality of olive pomace oil mostly affects the quality of soap produced by Syrians in Nizip.

8. The relationship between olive and oil and correct methods should be explained to farmers. An informative video-film can be produced *on proper preparation and care* of the soil, correct saplings, correct harvesting and correct process and shown to farmers waiting in the pressing factories.

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<sup>13</sup> <https://www.barefootcollege.org/solution/solar/>



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A summary of the items above is given in the following table:

<b>c) Augmenting products, processes and operations that create value</b>	<b>d) Creating new values</b>
1. Undertake an accurate and reliable crop estimation study	1. Encourage “suitable for the region” and “true-to-type/certified” sapling planting, conduct regional inventory study.
2. Employ more women <i>in stamp printing and packaging</i> at soap factories or workshops.	2. Plant 100,000 saplings that are “suitable for the region”, “true-to-type/certified”, and “well-yielding”
3. Increase the number of technical personnel needed by factories by giving machine operator and technician training.	3. Establish brining facilities in Gaziantep, Nizip, and Kilis for new saplings and traditional olive trees.
4. <i>Separately collect olives of different quality on the ground and from branches by supplying different colour boxes.</i>	4. Increase the use of renewable energy sources such as solar panels to reduce electricity costs.
5. Increase the number of packaged/branded products.	5. Establish an olive research and development centre
6. Learn and implement the <i>marketing strategy</i> .	6. Store olive oil in stainless steel containers. Build licensed warehousing project.
	7. <i>Establish a cooperative and an integrated facility</i> to recover the remaining polyphenols in the blackwater.
	8. Explain the relationship between olive and oil to farmers with correct methods

**8.5. Preliminary Evaluation of Projects with Value Chain Actors**

On 11 January 2018, a meeting was held in Gaziantep Chamber of Industry where the results of field study and project recommendations were shared with value chain actors. The list of participants is given in Annex-2. The 15 project recommendations in the following table were evaluated by the participants in terms of: a) importance and value added to the sector, and b) ease of implementation. The evaluations were made on a 10-point scale (10 points maximum, 1 point minimum) and the participants were reminded that they could score between 1 and 10 points. The 15 project recommendations have an average degree of importance of 9.3 points and average applicability of 7.1 points.



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Project Recommendations	a) Importance and value added to the sector	b) Applicability – ease of implementation
1. Increase the number of technical personnel needed by factories by giving machine operator and technician training.	9.9	8.1
2. Provide training on olive harvest and under what conditions the olive should be stored after harvesting (using ventilated cases instead of plastic or fabric bags). Meet the need for post-harvest equipment.	9.2	6.8
3. Undertake an accurate and reliable crop estimation study.	9.1	5.6
4. Increase the number of packaged/branded products.	9.6	5.7
5. Provide 4Ps marketing (product, price, sales channel, promotion) information and strategy training and consultancy for companies that want branding.	9.4	7.2
6. Employ more women in stamp printing and packaging at soap factories or workshops.	8.7	7.4
7. Rearrange fees for laboratory analyses on the basis of the price of 1 tin can of olive oil.	9.3	7.4
8. Encourage “suitable for the region” and “true-to-type/certified” sapling planting, conduct regional inventory study.	9.6	6.5
9. Plant 100,000 saplings that are “suitable for the region”, “true-to-type/certified”, and “well-yielding”.	9.1	7.7
10. Establish brining facilities in Gaziantep, Nizip, and Kilis for new saplings and traditional olive trees.	8.4	7.2
11. Store olive oil in stainless steel containers. Build licensed warehousing project.	9.6	6.8
12. Establish a cooperative and an integrated facility to recover polyphenols by treating blackwater, make soap from olive pomace oil, and obtain high-added value products (microalgae oil, animal feed, and fertilizers)	9.8	6.2
13. Increase the use of renewable energy sources such as solar panels to reduce electricity costs.	9.1	8.1
14. Explain the relationship between olive and oil to farmers with correct methods. Produce an informative video-film on proper preparation and care of the soil, correct saplings, correct harvesting and correct process and show it to farmers waiting in the pressing factories.	9.7	8.5
15. Pioneer the establishment of an olive research and development centre.	9.6	6.5
<b>Average</b>	<b>9.3</b>	<b>7.1</b>

A gap analysis was conducted taking into consideration the average 'high value' and 'applicability' scores. The analysis results are grouped under four categories:



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- 1. Higher value, easier implementation:** Project recommendations that create value above average and easy to implement above average,
- 2. Lower value, easier implementation:** Project recommendations that create value below average (which should be considered high for each recommendation) and that are easy to implement above average,
- 3. Lower value, more difficult implementation:** Project recommendations that create value below average (which should be considered high for every recommendation) and easy to implement below average,
- 4. Higher value, more difficult implementation:** Project recommendations that create value above average but are relatively difficult to implement.

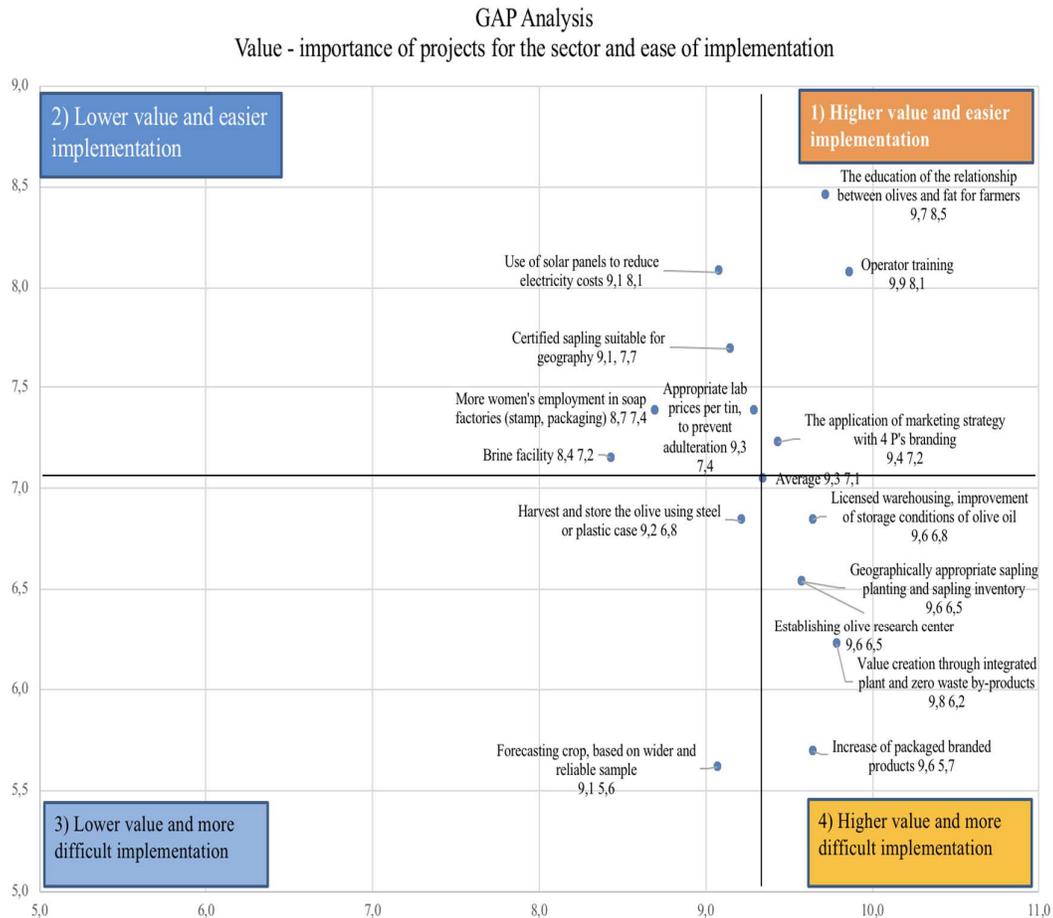
<i>Lower value, easier implementation</i>	<i>Higher value, easier implementation</i>
1. Increase the use of renewable energy sources such as solar panels to reduce electricity costs.	1. Explain the relationship between olive and oil to farmers with correct methods. Produce an informative video-film on proper preparation and care of the soil, correct saplings, correct harvesting and correct process and show it to farmers waiting in the pressing factories.
2. Plant 100,000 saplings that are “suitable for the region”, “true-to-type/certified”, and “well-yielding”.	2. Increase the number of technical personnel needed by factories by giving machine operator and technician training.
3. Rearrange fees for laboratory analyses on the basis of the price of 1 tin can of olive oil.	3. Provide 4Ps marketing (product, price, sales channel, promotion) information and strategy training and consultancy for companies that want branding.
4. Establish brining facilities in Gaziantep, Nizip, and Kilis for new saplings and traditional olive trees	
5. Employ more women in stamp printing and packaging at soap factories or workshops.	
<i>Lower value, more difficult implementation</i>	<i>Higher value, more difficult implementation</i>
1. Provide training on olive harvest and under what conditions the olive should be stored after harvesting (using ventilated cases instead of plastic or fabric bags) Meet the need for post-harvest equipment	1. Store olive oil in stainless steel containers. Build licensed warehousing project.
2. Undertake an accurate and reliable crop estimation study.	2. Encourage “suitable for the region” and “true-to-type/certified” sapling planting, conduct regional inventory study.
	3. Establish a cooperative and an integrated facility to recover polyphenols by treating blackwater, make soap from olive pomace oil, and obtain high-added value products (microalgae oil, animal feed, and fertilizers)
	4. Pioneer the establishment of an olive research and development centre.
	5. Increase the number of packaged/branded products.



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The results in the table above are charted in the figure below. Since both value and applicability criteria are taken into consideration in the evaluation of the projects, gap analysis and two-dimensional graphs were used instead of line or bar graphs.



**8.6. Overall Assessment**

When assessed against the four criteria of ILO, the project recommendations that will add high value to the sector can be listed as sapling growing, brining facility, operator training, and cooperative establishment. The following paragraphs provide conclusions on the value and rationale of each project recommendation, and the institutions and individuals that can cooperate within the framework of the project:

**Sapling Growing Project:** Olive sapling growing in Turkey is conducted according to the “Regulation on Certification and Marketing of Fruit/Grape Saplings and Reproduction Materials” published in the Official Gazette of 03.07.2009 issue 27277 (31.10.2006/5553-Article 6).



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The sapling growing project is important in terms of meeting domestic demand in olive and olive oil, growing climate and soil resilient “true-to-type/certified” olive saplings, providing employment for women and young people and eliminating seasonal work in olives. In short, the sapling growing project is one that can serve the institutional dimension by providing active participation of many actors such as producers, processors, research centres, universities and regulators in the value chain. In addition, the project includes a strong “peace” mission and message, as it symbolizes the peace of olives and the employment of Syrian women and young people. Even if the Syrians who work in this project go back to their country someday, the project area may continue as *“Peace Memorial Nursery”*.

Among the regulators and bridging organisations to be involved in the sapling growing are the General Directorate of Plant Production (BUGEM) and Department of Seeds of MoFAL, and Gaziantep Chamber of Commerce.

The planting of 100,000 saplings in the first stage was foreseen by the value chain actors interviewed. At this size, a minimum of 20 and a maximum of 50 employees are needed for a nursery. If 100-150 people are invited to the training and one third of the participants are willing to work after finishing their training, 50 employees will be employed to work on the sapling growing project.

In the growing of saplings, 8 to 10-cm long, and semi-wood with two leaves and branches not too young are used. The grafted replicant (cutting) to which the rooting hormone (IBA) is applied is rooted in bulk (perlite, peat) or preformed cocopit base paper pots under mist. Climate control during rooting is provided by mist systems. In approximately 60 days, the replicants (cuttings) with bare roots are placed in small plastic pots and those with large roots are placed in paper pots. The saplings are offered for sale when they are two or three years old.

The sapling growing centre may only focus on growing saplings as well as carry out different activities at the same time: making and marketing of Aleppo soap, playing a role in correct pruning, propagation by cuttings and teaching the right relationships between the olive and the soil, and between the olive and its oil. Depending on the experience of the experts who will work there, consultancy can be given on the marketing and branding issues that the industry needs.

***Brining Facility Project:*** Almost all participants agree that a brining facility would be beneficial for not-for-oil olives and large calibre olives. A brining facility is about to be completed by Kilis Organic Olive Producers’ Association, and a space for 8 to 10 tanks owned by farmer Mr. Recep Akar is available for use who also owns olive groves in Burç village of Gaziantep.

The drying method can produce brined olives. The project “Promotion of olive production with drying method and consumption of table olives” initiated by some Provincial Directorates of MoFAL in the scope of agricultural extension activities aims to produce ready-to-eat, salt-free olives without consuming chemicals. This project can also be initiated in Gaziantep and Kilis.

The crude olive, harvested in November and December, is kept in salty water pools for as long as 6 to 8 months and its water changed several times until June to finally become brined olive. The drying method in olive production can be done in a short time, even a day. Energy, water, warehouse rent, and labour costs are high in the production of olives in usual brining methods. In the oven drying method,



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production costs are very low. While chemical substances are used in olive production in usual brining, only vegetable oil, salt and vinegar can be used in production by the drying method. The salt content of the table olive which is produced in usual brining is at least 8-10% and the salt content of the table olive which is produced by the drying method can be reduced to 3-4%. This production method can be performed with very low investment and operating costs, and because production is made in a drying room or a desiccant to be placed in the field, there is the possibility to start production soon. For more information on different methods of brining, contact Instructor Mr. MÜcahit Kırak at Edremit Vocational Collage, Department of Olive Culture.

***Cooperative and Integrated Facility Project:*** In addition to the Organic Olive Union in Kilis, cooperatives and associations are needed for the olive produced under natural conditions but not organic. In this context, Kilis has a culture that is more conducive to forming a cluster.

The integrated facility can be set up as an innovative facility in the areas of blackwater, olive pomace and brining. By cooperating with Gaziantep University's Food Engineering Faculty, the blackwater can be treated with advanced technology to recover the remaining polyphenols and obtain such high value-added products as microalgae oil, animal feed and fertilizers.

One of the areas where the facility will make a difference may be the oil of olive pomace for cooking and cosmetics. For example, Spain has a 70% share in culinary olive pomace oil production, while Turkey has a very low share. The high amount of water in the olive pomace leads to increased free fat acidity and also affects the quality of products such as cosmetics and soap. Soap producers in Nizip can tolerate up to 40% acidity rate, but they cannot produce in high volumes because the acidity rate in the present products is increased to 70-80%. In the soap sector, the biggest market is Iraq. Since the price barrier in Iraq is below the medium, it is a market that is resistant to high price increases.

Olive pomace is a renewable energy source because it does not contain sulphur and has a low ash content, and is also used in the production of animal feed, fertilizer, biogas, activated carbon, and phenolic components.

***Machine Operator Training Project:*** The need for operators in the region was more emphasized by the Friends of Olive Association to which other participants agreed. If 150 women and young people receive operator training and one third of them continue, the operator needs of 70 enterprises in the region will be met. The more stable and determined women increase demand for women operators. The argument of the operator against the four-month seasonal employment is that the four-month earnings of good operators correspond to a yearly total of minimum wage.

Food technology training programmes are given within the framework of the lifelong learning programme of MoNE by conducting surveys with the actors of the sector across the country to determine clear directions and needs for development in the relevant occupational fields. Processing and hygiene training programmes are provided for those working in olive processing areas. In cooperation with this programme, the Friends of Olive Association has given an operator's course in 2015.

***Expectations of Syrian refugees for decent work and living spaces:*** Before the crisis, Syria's share in olive oil production and consumption was above that of Turkey and Tunisia; after the crisis it dropped



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to 3%. Although there has been no inventory of the status and number of olive trees in Syria since the start of the Civil War, Syrians living in Nizip and Gaziantep still speak of the existence of olive trees and olive production in Syria. Syrian soap manufacturers have demands that they be allowed to import high quality olive pomace oil for use in cosmetic and personal care products, and at least reduce customs costs.

In addition to the above-listed projects related directly to the olive sector, expectations can be determined by carrying out inventory studies related to the Syrians' profiles and abilities. Although the answer to whether they will stay or not in Turkey varies according to foreign relations, policy and economic conditions, tendencies and reasons for stay can be investigated. In light of such data, it may be possible to identify occupational areas that can match with Syrian refugees, and formulate policies and a roadmap.



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**Annexes**

**Annex-1: List of Interviewees**

A list of the participants who were interviewed to define the value chain and build project recommendations in November 2017 is given in the following table:

Association	Organisation	Title	Region
Rami Sharrack	Syrian Economic Form	Secretary General	Gaziantep
Tamam Albaroudi	Syrian Economic Form	President	Gaziantep
Emel Yılmaz	Ravanda Women's Association	President	Kilis
Aynur Durna	Ravanda Women's Association	Vice President	Kilis
Hayriye Öztürk	Ravanda Basin Rural Development Project	Field Coordinator	Kilis
Melek Kanbaglı	ACEV- Mother Child Education Foundation	Field Trainer	Kilis
Murat Çetin	Murat Olive Oil and Olive Friendly Association	Owner/President of Association	Gaziantep
Abdulbasit Dibo	SIAD-Syrian Businessmen Association	Expert ICT	Gaziantep
Khaled Babilli	SIAD-Syrian Businessmen Association	President	Gaziantep
Institution-Organisation-University	Organisation	Title	Region
Vakkas Koca	Silk Road Development Agency	Coordinator	Gaziantep
Abdulmenap Ertaş	Silk Road Development Agency	Programme Manager	Gaziantep
İbrahim Sarı	Özsarı Bulgur/Nizip Commodity of Exchange	Owner/President	Nizip
Hacı Gündoğdu	Gaziantep Provincial Directorate of MoFAL	Farmer/Olive Expert	Gaziantep
Prof. Dr. Fahrettin Gögüş	Gaziantep University Food Engineering	Dean of Food Engineering Faculty	Gaziantep
Derya Koçak	Gaziantep University Food Engineering	Asst. Assoc. Dr	Gaziantep
İbrahim Yılmaz	Gaziantep Metropolitan Municipality	Head of Agriculture Department	Gaziantep
Hamit Dogan	Project for Reducing the Impact of the Syrian Crisis on the South-eastern Anatolian Region (UNDP)	Key Expert	Gaziantep
Filiz Hösükoglu	Project for Reducing the Impact of the Syrian Crisis on	Team Leader	Gaziantep



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	the South-eastern Anatolian Region (UNDP)		
Mehmet Özyurt	Nizip Chamber of Commerce and Industry	President	Nizip/Gaziantep
Serpil Gündođdu	Nizip Chamber of Commerce and Industry	Secretary General	Nizip/Gaziantep
Hasan Tursun	FAO	Field Expert	Gaziantep
Özge Dursun	Gaziantep Chamber of Commerce	Freelance Consultant	Gaziantep
Ahmet Bağcı	Kilis Provincial Directorate of MoFAL	Engineer, Deputy Director	Kilis
Subhi Kord Arabo	Gaziantep Chamber of Commerce	Syrian Desk Expert	Gaziantep
Figen Çeliktürk	Gaziantep Chamber of Commerce	Deputy of Secretary General	Gaziantep
Kürşad Göncü	Gaziantep Chamber of Industry	Secretary General	Gaziantep
Sinan Atakan	AFAD- Gaziantep	Provincial Director	Gaziantep
Sedat Gökoglu	Gaziantep Provincial Directorate of MoFAL	Agricultural Engineer	Gaziantep
Adnan Keçeci	Ministry of Foreign Affairs Gaziantep Representative	Former Consul General of Aleppo Ambassador	Gaziantep
Tahir Canarşlan	Kilis Chamber of Commerce and Industry	Expert	Kilis
<b>Retail-Sales-Machinery</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Nuri Delibaş	Delibaşlar Agricultural Market	Owner	Gaziantep
Reşat Bozhöyük	Oli Market- Local Market	Manager of Market	Gaziantep
Sakine Karagöz	Oli Market	Purchase- Manager of Olive Oil	Gaziantep
Fatoş Erol	Oli Market	Purchase- Manager of Table Olive	Gaziantep
Mustafa Almacı	Almacı Pazarı-	Owner	Gaziantep
<b>Association</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Sinan Şahinalp	Kilis Province Organic Olive Producers' Association-Kilizi	Agricultural Engineer	Kilis
Hüseyin Polat	Kilis Province Organic Olive Producers' Association-Kilizi	President	Kilis
<b>Syrian- Olive Oil Soap Producer</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Waddah El Tahhan	El Tahhan	Owner	Nizip
Samer Al Najjar	Bayram Najjar Kimya	Owner	Nizip
Nader Barakat	Nader Barakat and Son's Co.	Owner	Nizip
Yahya Barakat	Nader Barakat and Son's Co.	Owner's son	Nizip
Hasan Raji	Alshahbaa	PR Manager	Nizip
Emin Barakat	Alshahbaa	Owner	Nizip



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M. Nour Elddien Barakat	Alshahbaa	Owner	Nizip
<b>Syrian Farmers</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Sabah	Women who work in the field	Syrian Agricultural Worker	Burç Village of Gaziantep
Shahud Haj Abbas	Farmer- Sapling producer/Friendship Association Of Syria	Father/President of Association	Kilis
Kemal Abbas	Farmer	Son	Kilis
Nimet Kevser Abbas	Farmer	Wife	Kilis
<b>Processors-Farmers</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Necdet Ceyhun Deniz	Deniz Tarım Ürünleri San.	Owner	Nizip
Ayhan Akpek	Güvenal Zeytin	Owner	Nizip
Bekir Karabacak	Yag Gıda ve Tarım Ürünleri San. Ltd. Şti.	Owner	Nizip
Esat Keskin	Beşler Food-Ülfet Yag	Production Manager	Nizip
Zafer Sever	Beşler Food-Ülfet Yag	General Manager	Nizip
Kadir Gümüüş	Gümüüşoglu Olive Co.	Son of Owner	Nizip
Bülent Özdemir	Özdemir Agriculture Co	Agricultural Engineer	Nizip
Maruf Marufoglu	Honorary President Of Olive-Pistachio Association	Lawyer and Farmer	Nizip
Kamil Filik	N.Filik Sabunları	Owner	Nizip
A. Rıza Dayı	Farmer and Processor	Owner	Nizip
Arif Ladin	Farmer	Farmer	Nizip
Necip Karakuş	Çavuşoglu Olive Oil	Owner	Nizip
Mustafa Çapan	Çapanogulları Olive Oil	Owner	Nizip
İbrahim Özkaya	Özkaya Soap Co		Nizip
Ali İhsan Öztaş	Farmer and Processor		Nizip
Burak Polat	Farmer and Processor		Nizip
Abdulkadir Kocaman	Farmer and Processor		Nizip
Bakr Ghazi Mohammed	Hayyawi		Nizip
Hafız Özaslan	Özaslan Olive Oil Co.	Owner	Nizip
Fatma Zehra Erbay	SBN Chemical Co	Owner	Nizip
Halil Ögüt	Şahin Soap and Olive Oil Co.	Owner	Nizip
Arif Çetin	Soap Factory	Owner	Nizip
A. Mithat Uygur	Soap Factory	Owner	Nizip
Hasan Pala	Soap Factory	Owner	Nizip
<b>Farmers - Dealers</b>	<b>Organisation</b>	<b>Title</b>	<b>Region</b>
Recep Akar	Tümosan Tractor Dealer	Farmer and Engineer	Gaziantep



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Levent Ziddioglu	Toros Fertilizer and Agrochemical Drinking- Sprinkler Irrigation System Dealer	Dealer and Farmer	Kilis
Mümtaz Akıncı	Akıncı Co.	Farmer and Processor	Kilis



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### Annex-2: List of Workshop Participants

A workshop was held on 11 January 2018 between 14.00 and 18.00 hours, where preliminary results and projects related to the olive sector were shared and evaluated. Participants in the workshop included ILO short-term experts, ILO Project Manager, President of Olive Friendly Association, Silk Road Development Agency official, Syrian Economic Forum directors, Ravandan Women's Association, Kilis ACEV Field Officer, Gaziantep Metropolitan Municipality Agricultural Services Units, Kilis Organic Olive Producers' Association, Kocayeyli Agricultural Cooperative President, Soap producer from Nizip, Sapling producer from Şanlıurfa, Kilis Chamber of Commerce and Industry and Gaziantep Chamber of Industry officials participated. The attendance sheet of participants is presented below.

		KATILIM İMZA FORMU			GAZİANTEP SANAYİ ODASI
Toplantı/Eğitim Konusu : ILO ZEYTİN VE ZEYTİN YAĞI SEKTÖR TOPLANTISI					
Toplantı/Eğitim Tarihi ve Süresi: 11.01.2018 / 14:00					
Sıra No	Katılımcı Adı-Soyadı	Firma/Kurum Adı / Ünvanı	Cep Telefonu	E-mail Adresi	İmza
1	Funda SURAN	ILO - Kısa dönem Uzman	532 3420505	funda.suran@gmail.com	
2	Norhan Turan Keleş	"	533 4796354	norhankeles@gmail.com	
3	Mahammad Damour	Syrian economic forum	5333683286	mdamour@syrianet.org	
4	Mualla Belta	GSO	542279766	s.alih@ese.org.tr	
5	WADDAH TAHHAN	GSO	5395634600	WADDAH2164@gmail.com	
6	Aynur DURAK	Ravandalı Kadınlar Derneği	05350194069	-	
7	Melek KAVRATCI	ACEV Saha Sorumlusu	05075678466	melekacw@gmail.com	
8	Hanide POLAT	S.S. Kocayeyli Tarımsal Köp	5539335760	-	
9	Hüseyin POLAT	Kilis organik zeytin üreticileri birliği	5303136155	huseyinpolat742@hotmail.com	
10	MURAT GEZİN	Zeytinbasi Denek Bşk. 678 Malazgirt	0 532 2865710	gezinmurat73@hotmail.com	
11	MARALYA AY	G.B.B. Tarımsal Hizmetler D.B.	532 432 5002	aymaralya73@hotmail.com	
12	Veynel Çelebi	Gaziantep Sanayi Odası	572 2265089	veynel@sgo.org.tr	
13	Hüseyin BİRZİK	Kocayeyli Fidançılık Projesi	5463316684	huseyinbirzik@gmail.com	
14	Vakılas KOCA	İKA	537-9177669	vakilas.koca@ika.org.tr	
15	Ayşe Gül ÖZBEK KANSU	ILO Program Sorumlusu	03124919770	ozbek@ilo.org	

		KATILIM İMZA FORMU			GAZİANTEP SANAYİ ODASI
Toplantı/Eğitim Konusu : ILO ZEYTİN VE ZEYTİN YAĞI SEKTÖR TOPLANTISI					
Toplantı/Eğitim Tarihi ve Süresi: 11.01.2018 / 14:00					
Sıra No	Katılımcı Adı-Soyadı	Firma/Kurum Adı / Ünvanı	Cep Telefonu	E-mail Adresi	İmza
1	Gülseren Nizip Akdoğan	Alkoz? Fırınları	572 2661500	akoz@dalart.com	
2	Mehmet ÖZGÜLÖZ	Kilis Ticaret Odası	0532 4118424	mehmet.ozguloz@hotmail.com	
3	Levent ZİDDİOĞLU	Ziddioğlu Ticaret ve Sanayi Odası	05426950491	toos78@gmail.com	
4					