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Turkey Resilience Project in
Response to the Syria Crisis (TRP)

Sectoral Roadmaps: **Food Sector in Turkey**

UNDP

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Designer: Arzu Çelik

Turkey Resilience Project in Response to the Syria Crisis (TRP)

JOB CREATION COMPONENT

2020

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2. Overview of the Turkish Food Sector

The number of companies producing food products in Turkey has slowly but consistently increased in the last five years, except for 2015. Furthermore, the revenues of these companies (in TRY) increased consistently between 2013 and2017. However, due to the fluctuations in the exchange rate, their sales volume in USD terms appears to have decreased in 2015 and 2017.

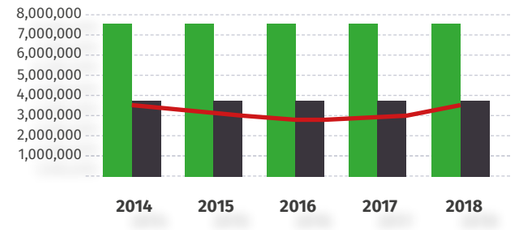
According to the latest statistics published by TURKSTAT, there were 47,617 food processing companies in Turkey as of 2017, and 595 companies producing beverages. The food industry made up 14.25% of all manufacturing industry by sales value in 2017 and the beverage manufacturing industry 0.70%. On this basis, the food and beverage producing sector is the second largest manufacturing industry in Turkey after motor vehicles. [1]

By the end of 2018, there were 611 instances of direct foreign investment in food and beverages with 101 investors from Germany, 44 from the Netherlands, 33 from France, 31 from the USA, 30 from Italy, 26 from Russia, 25 from Iran and 25 from Switzerland.[2]

1.1 Overview of Foreign Trade in the Food Sector

Despite economic fluctuations, the food sector has a foreign trade surplus and this trend is expected to continue. Iraq is the main export market for the sector with a share of 19.4%. Geopolitical risks in Syria and Iraq appear to be the main risks to exports.

Figure 1: Foreign Trade Balance of the Food Sector (USD 1000)



The food sector had a foreign trade surplus of USD 3.3 billion in 2015 and USD 2.6 billion in 2016. The foreign trade surplus remained the same at USD 2.6 billion in 2017 due to a rise in imports. In 2018, the foreign trade surplus was USD 3.4 billion.[3]

[1] Overview of the Agriculture and Food Sector in Turkey - O. AÇIKGÖZ, A. GUNAY 2018

[2] investinturkey.com

[3] Global Industry Outlook Report, Gulfood, 2019

Although Turkey's food imports are lower than its exports, Turkey imports intermediate goods, livestock and animal feed. An increase in average imports has been observed in recent years. According to the Harvard Economic Atlas, Turkey imports USD 5 billion worth of food and beverages every year. Raw materials used for food production, which amount to USD 3 billion, constitute a high proportion of these imports.

1.2 Trends in the Turkish Food Sector

The food producing/processing industry in Turkey has benefited from ongoing economic growth, and at the same time been one of the drivers of growth, for over a decade. In years when the pace of GDP growth has stagnated or declined, the food producing/processing and food retailing sectors have always been the least affected. The sales volume of the processed food industry is expected to increase in the years ahead. This anticipated growth will be fuelled by continuing urbanisation, a large young population more accustomed to consuming processed food than the older population, and the increased participation of women in the labour force. Particularly in large cities, the number of single-person households, which tend to consume processed, packaged and frozen foods, is increasing.

The Turkish food sector produces a broad range of products from meat and fish to vegetable oil and animal fat, and from processed fruits and vegetables to alcoholic beverages. It has a prominent place in the manufacturing industry with respect to the number of companies, employment, foreign trade, value added and turnover. However, due to its low-technology structure, it underperforms in other indicators such as R&D and capacity utilisation rates. The food sector is a labour-intensive sector due to its low use of technology, limited automation and mechanisation, and the large number of small companies in the sector. It ranks first among all manufacturing industries in terms of the number of companies but comes third after textiles (13.7%) and clothing (12.7%) in terms of the number of people employment.

Although Turkey has significant advantages in agriculture, crops and livestock, it has not yet achieved the desired level of efficiency in food safety.

In recent years, the food sector has been going through a structural adjustment process. Consumer preferences, changes in income levels, changes in the population structure and new life-styles have been affecting the sector increasingly. The sector has also been affected by globalisation and the liberalisation of world trade and agricultural markets, including emerging markets. In addition, fundamental changes in technology, including information technology and biotechnology, have led to the introduction of new products and new ways of organising supply chains.

Fluctuations in the supply of food resources and the related price volatility have added to the importance of using existing raw materials more efficiently. Changes in domestic and foreign demand have pushed the food industry to become more innovative and use advanced technology. The food industry has become much more focused on issues such as food safety, environmental awareness, foreign trade and corporate competitiveness.

The growth in the numbers of young people and migrants in the population, the growth of tourism and the expansion of organised food retailers have had a positive impact on the performance of the Turkish food sector. In recent years, an increase has been observed in the consumption of organic and functional foods and beverages as well as healthy and healthily processed foods. There has been significant growth in e-commerce in the sector.

The production of field crops in Turkey is heavily externally dependent in technology. Most companies are also dependent on foreign resources for technical know-how. There are striking contrasts in the levels of technology used by companies in the various sub-sectors. In this complex environment, both products which are competitive on foreign markets and products produced under rudimentary conditions are able to find buyers on the domestic market.

The following key issues have been identified in the Turkish food sector:

- The sector is undergoing major, rapid changes, and SMEs are having to adapt quickly in order to be able to compete on national and international markets. Companies are also having to adapt to new concepts and standards such as quality standards and other certification requirements, and to consider issues like green production, environmental responsibility, water consumption and climate change.
- The food sector cannot be considered separately from the agricultural sector, which provides it with its raw materials.
- Differences between the food sectors of different countries in the word can be linked to differences in the levels of development of their agricultural sectors. Companies also appear to diverge depending on the structure of demand for their products. Every country or group of countries tries to adopt the legal, economic and commercial approaches which respond best to their own interests and further their self-sufficiency.
- Natural disasters such as drought and flooding affect the development of the sector and influence the political attitudes of countries with respect to food products.
  Companies are facing significant challenges due to the demands of the market for high quality food, food safety and hygiene, and to new packaging trends, product diversity etc.. In this context, R&D, innovation and the use of advanced technologies can improve their competitiveness.
- Clustering is one of the most important tools which small and medium-scale companies can use in order to remain competitive and to increase their influence in the food sector value chain.
- Companies need the support of other stakeholders and the relevant institutions in order to bring about improvements in the realms of legislation, basic infrastructure, the availability of qualified employees and access to financing.
- Although companies in different sub-sectors vary in terms of competitiveness and future goals, they also face similar problems and challenges.

2

Global Trends in Food Processing

The food processing industry is a traditional sector which is experiencing difficult times due to increased food safety demands, low confidence and the demands of consumers for more sustainable, higher-quality food.

The sector is affected significantly by many external factors including climate change, demographic changes, new commercial partnerships and global population growth projections, as well as economic trends.

Agriculture and food processing continue to be important sectors. Although these sectors are most commonly associated with developing countries, the successes of some developed countries such as Denmark and the Netherlands (which are among the leading countries in the world in milk exports, poultry etc.), indicates that further development can be achieved in the sector.[4]

The agriculture and food sectors are important for achieving shared prosperity that provides employment and development opportunities for less qualified segments of the labour force in less developed regions. A competitive economy depends on many factors. These include:

- Creating efficient institutions
- Investing in physical infrastructure
  Creating an enabling macroeconomic environment
  Investing in healthcare and education
  Improving market access
- Providing fertile soil markets
- Providing access to marketing
- Adopting innovativeness, efficiency and technology

Efficiency is the main driving force of economic development in the long term and the main source of differences among countries in GDP per capita. For most developed countries, innovation tends to be the main driving force behind efficiency and particularly, multi-factor efficiency. Innovativeness is the key to future growth and competitiveness and is also required to address social and environmental challenges including energy supply and climate change. Innovation may contribute significantly to increasing labour efficiency and thereby assist in maintaining low labour costs per unit and strengthening international competitiveness. Innovation may also help companies to enhance product quality, upscale company outputs or offer radically new products and services.

Today, the food supply chain has become more global, longer and much more complex than ever before. Due to increased imports and exports, processed foods are now dependent on longer supply chains, which create major challenges in ensuring food safety.

[4] The Future of Food and Agriculture, Trends and Challenges, FAO, 2017

3

Future Scenarios

Reports published by the United Nations indicate that world population will reach approximately 7.7 billion in 2019; 8.5 billion in 2030, 9.7 billion in 2050 and 10.9 billion in 2100. Overall food demand is expected to increase by between 59% and 98% by 2050. Along with this increase, the growing global middle class is demanding better quality food. As a result, existing food production levels will need to be almost doubled. Yet while increasing the demand for food, the world's growing population is putting more and more pressure on agricultural land, forests and water resources.

By 2030, India is expected to have the largest population in the world, amounting to a third of the Asian population and 17% of the total world population. By 2050, it is believed that India, China, Indonesia, the Philippines and Pakistan will make up more than 50% of the world's population.

It is predicted that two thirds of the world population will be living in cities by 2050 and that the demand for processed foods and meat protein will increase.
It is also predicted that 65% of the global middle class will be living in the Asia Pacific region by 2030 and the increased disposable income in developing economies will increase the demand for food products.

Meanwhile, groundwater resources are being depleted rapidly and biodiversity is being eroded significantly. Each year, billions of tonnes of greenhouse gases are being released into the atmosphere due to the burning of fossil fuels, leading to global warming. The global demand for irrigation water is expected to increase by 19% by 2050. It is estimated that 69% of freshwater resources will need to be used for agriculture.

4

Findings of the Field Study on the Food Industry in the Region

- **Company infrastructure:** While 59% of the companies in the analysis have boards of directors, 18% are run by their owners. This situation tends to reduce the amounts of resources which companies allocate to other activities in the value chain. The management of only 12% of the companies is influenced by R&D and technical departments.

- **Human Resources Management:** 67% of the companies in the study stated that they have difficulties in finding qualified employees to work in production.

- **Technology Development:** Although most companies have low technological capacities, they use software for operational processes. Companies gravitate towards Middle Eastern markets instead of markets that require high R&D expenditure and high standards. While 30% of the companies stated that they are competitive in European markets, 35% mentioned that they are more competitive in Middle Eastern markets. Of all the companies surveyed, 44% consider their levels of technology to be adequate for competing on the international market. A further 38% consider themselves adequate for the national market and 13% for the market in their own region, whereas 6% report that they are not competitive in terms of technology.

- **Procurement:** Almost half of the companies have difficulty in procuring important inputs. Moreover, companies are observed to have to allocate significant resources to procurement activities due to the high number of intermediary inputs in the final product.

- **Inbound Logistics (the process of obtaining and storing inputs):** Inputs used by companies are mostly procured from local and regional sources. The import dependency of production processes was found to be 33%. It was observed that significant gains could be made by minimising transport costs in the first link of the supply chain.

- **Production Operations:** Although the technology used in production processes is new, there is still a shortage of qualified human resources. Stock management software is being used in production processes but is still not yet adequate for organising large-scale operations. Supporting companies with know-how (expertise) would provide them with the opportunity to grow and development more rapidly. Efforts should therefore be made to add information and innovation to the value chain and ensure that joint projects are conducted with universities in order to utilise their R&D and innovation capacity.

- **Outbound Logistics (Distribution Process):** During the distribution process, products go through a check point before leaving storage, but although companies have storage control systems, they are observed to experience difficulties in the distribution process.

- **Marketing and Sales:** It was found that 5% of companies focus on local sales channels, 11% on regional channels, 37% on national channels and 47% on international channels

- **Post-sales Services:** A majority of the companies consider post-sales services important and a significant proportion have identified a method for measuring customer satisfaction.

The following conclusions were drawn on the basis of the findings from the interviews conducted with the enterprises:

- Branding is not a priority for companies as a means of increasing competitiveness and awareness of the benefits of marketing activities is low.

- Manufacturing companies are mostly small-scale/family companies. Corporate management is insufficiently institutionalised.

- Personnel competencies and the degree of professionalism are not high.

- There is some awareness about future trends in the sector, but it needs to be increased. Since investment is necessary for increasing competitiveness and adapting to new market trends, support should be provided to increase the access of the companies to financing and/or for the facilitation of access to finance by the government. Other fundamental limitations are also closely related to the policies implemented by the government.

- The production costs of agricultural products are high and this reflects negatively on the food production sector. Exchange rate fluctuations have had a negative impact on input costs both for agriculture and for the food sector.

- The sustainability of the quality and quantity of agricultural products should also be considered one of the main challenges.

- Exports from the study area are mostly oriented towards the Middle East market. One reason for this is the region's geographical advantage. Another is that higher value-added and product and service quality are required in order to be competitive on the domestic market and in European markets.

5

Main Challenges Faced by the Food Sector in the Study and Recommendations

Although the study area has a significant competitive advantage in terms of field-grown food due to its climate and geographical characteristics, it is unable to use this advantage. This problem may be caused by insufficient investment in the standardisation, processing and marketing of field-grown food. It is particularly striking that products with high value added cannot be manufactured in the area, and that the performance of the food sector in terms of R&D and innovation is below average for Turkey. The other main challenges of the sector which need to be resolved are as follows:

- High input costs
- The current economic climate and country risks – These constitute the greatest challenge to the further development of companies
- Challenges in accessing financing for routine operations as well as R&D and new technology investments
- Obstacles to sales, distribution and marketing in international markets
- Lack of awareness of the benefits of branding and marketing
- Problems with finding qualified employees
  Poor coordination and cooperation among sectorial actors and public entities

Agricultural inputs are vital for the food sector. As income levels in developing countries increase, the food industry will need to meet a variety of new requirements from consumers with high economic status. In return, the food industry will have to support agriculture through its own efforts to address new challenges and opportunities. The food industry will need an increased supply and variety of better-quality agricultural products and commodities. With the downward pressure on agricultural product costs, agriculture will also be called upon to provide supply not seasonally but throughout the whole year.

The reliability of the quantity, quality and timing of supplies will take on added importance and become the key criterion in the selection of suppliers. Meanwhile, innovative producers who are able to produce more easily or at lower cost, and who can provide a greater variety of products are likely to gain a competitive advantage. Meanwhile, health-related issues will become increasingly more important in food consumption. All in all, there is a need to focus on the agriculture and food sectors simultaneously and create stronger links between them.

For these reasons, it is recommended to focus on the following goals, which correspond to the goals of the Strategic Plan of the Ministry of Agriculture and Forestry, to enhance competitiveness and food safety in the project area.

- Enhancing the capacities of institutions
- Creating an enabling macroeconomic environment
- Investing in human resources and their training
- Supporting efforts for collaboration
- Improving market access
- Developing Quality, Efficiency and Food Safety systems
- Supporting product diversification and product development efforts
- Developing innovative and technological practices
- Ensuring sustainable management of natural resources

Recommendations

The following solutions were set as the objectives of the Strategic Plan of the Ministry of Agriculture and Forestry[5], which is the governing body of the agriculture and food sector, for 2018-2022:

- Carrying out research and development activities to increase quality and productivity in agricultural production,
- Ensuring accessible and sustainable supply of agricultural products and creating an agricultural sector with high national and international competitiveness,
- Ensuring food and animal feed safety by complying with international standards from production to consumption to protect natural resources and human health
- Taking preventive measures for plant health, controlling and exterminating animal diseases and pests, ensuring animal welfare,
- Improving the rural economy and enhancing agricultural, social and physical infrastructure of rural areas,
- Protecting aquaculture resources and ensuring their sustainable operation, developing aquaculture production,
- Carrying out research and development activities to increase quality and productivity in agricultural production,
- Enhancing institutional capacity.

The conduct of activities in the region and the implementation of the recommended Sectorial Roadmap will require the support of the central government and legislators. The sector needs support and additional regulations. The recommendations of this report are in line with the Strategic Plan of Ministry of Agriculture and Forestry.

The following sections of this report will outline the various potential areas of improvement which will constitute the focal points of the food sector roadmap of the region. The roadmap itself will serve as a guideline for making the sector more competitive and developing it as a better source of employment. The areas of improvement are addressed under five categories.

A. ORGANISATION AND CAPACITY BUILDING

A.1 Local and national level organisation

The institutions and stakeholders which will be involved in ensuring the supply of the diversity of services which the sectorial actors in the region need, based on the goals recommended above, must first be organised. All the stakeholders should coordinate their efforts to avoid duplication and waste of resources. To this end, it is very important to create an institutional framework involving regional and local decision-making and implementing bodies to coordinate agriculture and food related policies. The first step that needs to be taken to improve the sector is to create institutions in the region which can focus on providing solutions for the problems that have been identified. These institutions should then carry out work to address problems at different levels, all of which need to be taken into account.

It will only be possible to implement the roadmap if local stakeholders adopt and own it, and take the necessary steps to implement the strategies recommended.

A.1.1 Identification of Local Stakeholders

It is important for local stakeholders to take ownership of the roadmap. The first step should be to identify the local stakeholders and ensure their commitment.

A.2 Development regional and national infrastructure

This is the development axis which will constitute the backbone of the work to enhance the competitiveness of the sector. Actions to be undertaken at regional and national levels, improvements to be made in the legislation and the infrastructure of training and counselling services and activities aimed at the development of SMEs operating in the agriculture and food production sectors will be conducted under this group of activities.

In this regard, institutions should be established in three different areas. These are:

1. the organisation of a sectorial network structure to take ownership of and implement the roadmap and form the implementing team,
2. the organisation of stakeholders at the regional level, and
3. the organisation of stakeholders at the national level.

A.2.1 Ensuring coordination among relevant regional institutions in the food, beverages and agriculture sectors and between these and government entities

The relevant local stakeholders should form a coordination infrastructure to ensure that the recommended actions in the areas of improvement are accurately conveyed and implemented. The establishment of a sectorial network in each province of the project region is recommended. This could be called the Regional Food Network Platform (RFNP). The network should then select and appoint an Implementing Team to carry out the actions suggested by the roadmap.

[5] Strategic Plan, Ministry of Agriculture and Forestry, 2017-2018

The RFNPs should also communicate with each other. Their primary duties can be summarised as follows:

- Coordinating stakeholders as they implement roadmap actions
- Lobbying central government for the adoption of necessary policies, reviewing legislation related to roadmap actions and making proposals
- Monitoring and evaluating the activities of the implementing team

A.2.2 Improving existing legislation to support the development of the agriculture and food industry and its adaptation to the new trends in the sector

Significant progress has been made within the last decade towards strengthening the legal and institutional framework of the field-grown food sector. However, more effort is necessary to transform state economic enterprises into economically viable units operating under competitive market conditions. The information and innovation system of the sector, which has received a very limited share of the support that has been provided so far, requires greater public investment.

It will be beneficial to focus on research and incentives that will support and contribute to an increase in the competitiveness of the agriculture and food sectors through the production and branding of products with high value added. Legislative arrangements may be made to transform the public research institutions in the region into international centres of expertise for one or more significant agricultural or food products in which there is potential for expansion in the region.

Efforts should focus on:

- Reviewing Turkey's policies with regard to innovation, structural change, and access to and utilisation of natural resources, as well as to climate change mitigation and adaptation, which will be a major consideration for increasing efficiency and the sustainable use of resources,
- Steering agricultural policies towards the sustainable use of natural resources as well as improved agricultural efficiency and income growth instead of simply meeting production targets,
- Shifting towards policies that will provide producers with adequate flexibility to respond to market conditions, as an alternative to product-specific subsidies which distort output and input prices,
- Raising investments to meet the needs of manufacturers and investments aimed at agricultural innovation, human resources (training and skills) and strategic physical infrastructure,
- Scaling down the structures of state economic enterprises, shifting towards a more balanced distribution of public resources including the termination of existing support provided to these enterprises and agricultural cooperatives, and so freeing up additional resources for agricultural information, plant and animal health and food safety systems,
- Reviewing the legislative framework with a view to facilitating the establishment of cooperatives and supporting their activities and investments based on successful outcomes in terms of quality and food safety,
  Exploring the opportunities offered by the new national agricultural information system to produce more comprehensive and up-to-date evidence on trends in and determinants of agricultural efficiency,
- Enhancing the efficiency of water consumption by cooperating to develop and modernise irrigation systems, implementing simple, official, transparent water sharing mechanisms and ensuring the financial feasibility of irrigation systems,
- Integrating climate change mitigation and adaptation efforts as a cross-cutting issue into agriculture and agriculture-related environment policies; raising awareness among all stakeholders of climate change, and as far as possible involving local stakeholders in monitoring at local level,
- Evaluating the long-term financial and actuarial soundness of the existing subsidised agricultural insurance scheme with climate change risk in mind; monitoring the scheme to ensure competitive services, and equipping farmers with various risk management tools including accessible information and adapted tax and social security mechanisms,
- Strengthening and improving the rural diversification activities being conducted by various institutions and under various programmes (for regional and rural development, labour force and education); emphasising rural diversity in regional and rural development investments within the context of a coordinated national rural diversification framework that focuses on the development of rural industries including those with agriculture-based inputs.

A.3. Institutional capacity building

Once structures have been established to support sectorial development, institutional capacity should be built to ensure their effective operation. Capacity building work should concentrate on:

- Building the capacities of the proposed Network and the Implementing Team,
- Building the capacities of stakeholders in each province,
- Building the capacities of agricultural actors (producers and small and medium-scale enterprises - SMEs) in each province, as well as those of food sector SMEs

The capacity building work for SMEs and producers should be initiated immediately since they are the decision makers and no activity can succeed without their commitment. The focal point in this regard should be well-run corporate management.

A.3.1 Enhancing the capacities of institutions in the agriculture and food sector; ensuring the sustainability and effectiveness of training and counselling activities

One activity that can be implemented in the short term is to devise an education and awareness-raising policy including amendments to legislation that will contribute to a productive society similar to those found in the countries where modern agricultural practices are implemented, and restore the mutual trust of producers and their confidence in the system, thereby ensuring that agricultural institutions are cohesive and economically effective.

The economic sustainability of producers and SMEs depends on well-organised producers' organisations. Guidance should be provided to SMEs in this regard.

It is particularly important to address the problems of vocational education and training and to encourage other institutions besides government entities to focus on these areas, to encourage public and private entities to cooperate in the field of education, to ensure cooperation among industrial and professional associations for the development of training packages together and the updating of existing packages, and to support job placements and vocational and higher education in the field-grown food sector.

A.3.2 Establishing and implementing a training and certification infrastructure for training qualified personnel and intermediate personnel (investment in human capital)

The food production sector can also be improved by developing qualified personnel capable of keeping up with new trends and the rapid changes in the world. Some of the approaches that may be adopted are listed below:

- Forming a partnership between the educational system and the industry to improve educational standards and better meet the employment needs of the food production sector,
- Providing support for on-the-job training, apprenticeship and vocational programmes via tax incentives and additional state fund allocations provided to food production companies,
- Developing a Regional Operator Certification Training Programme for the food industry at vocational level and/or for high school graduates,
- Utilising pilot facilities financed by the state to train chemicals operators, technicians and other food processing personnel.

A.4 Increasing the impact of the support and incentives provided for the agriculture and food sector and ensuring their effective distribution

This area of improvement can only be addressed by decisions of central government. However, it will suffice for local stakeholders to be empowered to act as leaders in mitigating certain legislation-related challenges encountered at different levels, such as regulatory procedures and administrative burdens related to entrepreneurship and in particular to establishing new businesses.

Existing regulations and procedures should be examined and critical areas should be identified for further financial support. It is important to improve the incentives for those operating in the field-grown food sector. This will develop the environment for private investment in agricultural enterprises. The following activities are particularly recommended:

A.4.1 Support clustering and cooperation activities

Cooperation and clustering initiatives involving producers and SMEs could be subsidised. Provided there is evidence of commitment on the part of the relevant sectorial actors, written protocols may be drawn up or documented clusters formed.
Cooperatives in Turkey are incorporated under three different fundamental laws, which leads to disparities and inequalities:
Law No. 1163 on Cooperatives (1969)
Law No. 1581 on Agricultural Credit Cooperatives and Unions (1972)
Law No. 4572 on Agricultural Sales Cooperatives and Unions (2000)
All these laws need to be combined into a single integrated law covering all cooperatives. Creating awareness of the issue will be helpful.

A.4.2 Supporting contracted agriculture

Contracted agriculture practices should be supported to develop the field-grown food sector, lower the input costs of industrialists, ensure a continuous supply of raw materials and achieve sustainable quality. A mechanism could be established to monitor developments in this regard, and producers and SMEs willing to work in this way could be subsidised.

A.4.3 Reviewing existing incentives to achieve greater efficiency and competitiveness in the sector

Various incentives are available from different ministries to the project's target group in the areas of employment, investments, production, exports, marketing and R&D and innovation activities. Most manufacturers and SMEs benefit from these incentives. However, these incentives should be reviewed and adapted to new developments in the sector and their contribution to competitiveness should be enhanced.

There is a need for close coordination among local stakeholders and regional representatives of government agencies. The main goal should be to ensure regional competitive advantage and determine the incentives needed to achieve this as rapidly as possible.

A.5. Devising policies to reduce input costs in agricultural production and the food industry

The local stakeholders who take ownership of the roadmap should take the initiative in proposing policies to national government and ensuring their adoption and implementation. The most important recommended policies are listed below:

A.5.1 Policies for agricultural production inputs

Agricultural producers need consistent and adequate incomes if they are to remain in agriculture and continue providing inputs to the food sector. However, producers cannot estimate their revenues accurately due to the dependence of agricultural production on natural conditions, the low supply and demand elasticity of agricultural products, and the fact that agricultural product prices are sensitive to risks and uncertainty. One of the unchanging goals of agricultural policy is to balance producer revenues. Policies for the utilisation of inputs can be used as an important tool for achieving this goal.

If the costs of agricultural inputs such as fuel, fertilizer, pesticides, labour and seeds are high, then the prices of agricultural products, which are the inputs of the food sector, will also be high.
In the mid-2000s, the necessary arrangements were made for the development of the seed sector in Turkey and remarkable progress was made in terms of quality and quantity. However, since seeds are the main raw material of production, and dependence on inputs is a risk in terms of food prices, the sector needs to be developed with this in mind. It is very

important to focus on local seed production and on R&D efforts to produce local seeds in certain products. This will confer an advantage as long as the domestic raw materials are able to compete with foreign ones in price and quality. Biosafety legislation will increase the cost of imported inputs both in factories and in livestock raising, while GMO analysis will emerge as a new cost factor. In future regulations, all institutions are recommended to make use of the common definitions and terminologies used by the European Union and international organisations. It is important to take the recommendations of the European Food Safety Authority (EFSA) into account while implementing the law. For example, differentiation based on the raw materials, seeds and materials to be directly used in the food industry may be prioritised as a supportive policy to cover new costs.

A.5.2 Managing resource efficiency in the food sector

Resource efficiency has become a significant issue for maintaining the competitive position of the manufacturing industry due to the increased environmental harm caused by technological and industrial developments, the rapid decrease in non-renewable natural resources and the rising cost of resources. Resource efficiency is defined by the United Nations Environment Programme (UNEP) as the sustainable production, processing and consumption of natural resources and the reduction of the negative environmental impact created during the production and consumption of products throughout their life cycles. In contrast to traditional pollution control methods, it aims to prevent or reduce waste generation at source and minimise the environmental impact caused by production. In this way, in addition to higher profitability, it encourages the development of new technologies and increases employment, releasing potential for innovation and growth. The development and implementation of new production processes also leads to the design of eco-efficient products and increased recycling and re-use of waste (Europe EEIG, 2012).

While industrialisation was prioritised in the past, policies for increasing "competitiveness" are being followed today. For the Turkish manufacturing industry, which faces competitive pressure from countries with low labour costs such as China and India, policies and strategies focusing on competitiveness are extremely important. Turkey has achieved great progress in its manufacturing industry since 1980s. Strategies will be identified for integrating the manufacturing industry into the global industry, using resources (energy, raw materials, water) efficiently, decreasing costs, improving the transport infrastructure and R&D activities, developing a qualified labour force, enhancing the capacities of businesses and developing environmentally friendly production policies. These strategies will also increase Turkey's competitiveness.

For the management of resources, which constitutes the key factor in sustainable competitiveness for both and the food sector, it is necessary to focus on efficiency. The first things that come to mind under resource efficiency are the efficient use of energy, water and raw materials.

Energy Efficiency

Energy efficiency encompasses a range of measures in areas such as preventing energy loss, ensuring the recovery and utilisation of waste, reducing the demand for energy through the use of advanced technological processes, introducing energy recovery systems and developing more efficient energy resources.
Ensuring sustainability in energy depends on reducing import-dependency, alleviating the burden created by energy costs on the national economy and promoting the efficient use of energy resources. While energy demand and prices have risen, a continuous decrease is envisaged in the use of fossil fuels, which currently serve as the primary fuel resource. Together with energy security and other environmental factors, all this needs to be taken into account when focusing on energy efficiency to keep the planet liveable. This means that we need to use renewable energy resources a lot more in the future and focus more on energy efficiency.
Like all sectors, the food industry is closely concerned by issues such as energy efficiency, energy accounting, control systems, insulation, new technologies and industrial processes, raw material properties, product varieties and properties, climate conditions and environmental impact and capacity utilisation.
Energy is one of the major input costs for agricultural and food production. Some initiatives have been taken in the region to generate renewable energy, but these initiatives remain very limited. One of the clustering activities could focus on renewable energy. If supported with incentives, this could encourage further new investments.

Raw Material Efficiency

Turkey's sustainability principles for raw material efficiency are mostly reflected in its national development policies. The 10th Development Plan highlighted the importance of utilising environmentally friendly techniques in industry and aimed to achieve more efficient production and reduce waste. In Turkey, efforts to achieve raw material efficiency are very important in sectors operating within the manufacturing sector such as chemicals, textiles, food, main metals and non-metal mineral products, since these have particularly high levels of raw material consumption and potential savings.

Water Efficiency

The quantity of water resources on earth is stable but their distribution is irregular. Along with pollution and climate change, the rapid increase in the world population and the increase and diversification of the demand for water have turned this vital resource into a strategic issue, especially for water-poor countries. There is an ugent need to develop strategies to ensure water efficiency at the national level to make water a sustainable resource (Greco Initiative & Regional Activity Centre, 2007).

Efficient use of water needs to be ensured by developing policies for using the right quality of water in the right place, such as using drinking water or higher-quality water in food and beverage production.

Various activities are currently being carried out in Turkey for the harmonisation and implementation of the EU Water Framework Directive. This directive envisages the management of water resources within a framework of environmental and economic sustainability. Policies for "determining water tariffs" are included in the directive. Consequently, policies for formulating water tariffs are very important if the directive is to achieve its goals, especially in reducing the use of water and encouraging its recycling. Currently, since Turkey has not yet fully adopted the EU Water Framework Directive, particularly in terms of determining water tariffs, groundwater can be used in manufacturing industry at very low cost or for free. Moreover, some enterprises do not measure or monitor their water use regularly, since water costs are very low or non-existent, and consequently they do not try to make any improvements to achieve water savings.

In addition to the policies to be developed and measures to be taken to encourage more efficient use of resources in both the agriculture and food industries, and to promote practices to conserve water, energy and raw materials, the consumption of these resources in manufacturing industry in general also needs to be regulated and supervised effectively, and they need to be priced in a way that reflects the actual costs.

B. IMPROVING COLLABORATION

Commercial cooperation among SMEs should aim to create a network that involves a group of companies which use combined resources to collaborate on joint projects. Business networks may take different forms and serve different purposes. Different commercial/legal models may be employed. SMEs could simply come together by themselves and engage in joint activities, or they could form consortia or cooperatives or enter into network contracts. The same approaches can be taken in collaborations between SMEs and producers.

Forms of collaboration

Strong.....Weak

Type of cooperation	Mergers & Acquisitions	Cooperatives	Partnerships	Private Alliances	Non-private alliances	Contract partnerships
Justifications/ Benefits	Portfolio diversity; Geographical expansion; Vertical integration to ensure supply safety; Internalisation of margins; Synergy revelation	Economies of scale Increased bargaining power	Acquiring free skills Cost/risk sharing	Acquiring free skills Cost sharing	Acquiring free skills Cost sharing	Supply safety Creating value added

Source: KPMG International, 2013

B.1 Improving field-grown food, business and industry clusters among SMEs and manufacturers

Small companies may achieve what they cannot do on their own by coming together as a group that can act a single entity, and competing as individual companies that are part of larger, more competitive companies. Even where there is strong competition among companies, a high level of cooperation may be achieved if different stages of the production processes are undertaken by different companies. In other words, small, specialised companies may divide up the work process and group together or re-group depending on the needs of the market. This model will allow for flexibility and short response times, which cannot usually be achieved by large companies with fixed assembly lines. Mutual connections among companies need not make them dependent on one another.

Collaborations vary in importance and intensity and companies only establish and maintain those that are valuable to them.

The primary benefits of partnerships include reduced operating costs, enhanced personnel qualifications, better access to private information, a larger labour force supply, easier access to financial resources, technology-based improvements, more innovation, the development of new products, and higher international sales and competitiveness. The partners complement one other. Since innovation is affected by cooperation, when SMEs maintain their close "collaborative competition", this leads to further innovations and potential advantages in production.

The recommended Sectorial Network Platforms for the region should take the initiative to:

- Supporting the preparation of cooperation policies,
- Set the environment for the business world and build trust among target groups,
- Raise awareness and motivation for cooperation within the target audience,
- support the commercial cooperation initiatives of producers and SMEs.

Regions have their own specific characteristics. As mentioned earlier, Adana, Hatay and Mersin have strengths in the production of field crops, vegetables and fruits. Based on this, the most appropriate activities for clusters could include:

- Training farmers and food enterprise owners on Good Agricultural Practices and their implementation,
- Processing and packaging field crops, vegetables and fruit (especially citrus fruit),
- Storing and transporting products jointly and thereby lowering costs,
- Creating a regional brand for the products produced,
- Marketing products in ways that ensure food safety and sustainable quality.

B.2 Encouraging the establishment of field-grown food cooperatives and supporting their activities

Cooperative entrepreneurship needs to be developed in Turkey by raising awareness about cooperatives and focusing on education. Organisational improvements will also contribute to increased competitiveness in the agriculture and food sectors.

It is also recommended that field-grown food cooperatives in the region – and even confederations of cooperatives – should be encouraged to work together.

Newly established and effectively operating

cooperatives will enable farmers to act together when procuring inputs that will lower their costs and strengthen their positions in markets such as fruits, vegetables, food products and meat in Adana and Mersin, fish and poultry in Hatay, and olives, pistachios etc. in Gaziantep and Kilis. This may also lead to opportunities for joint investments in business and logistics facilities.

In addition to these short-term initiatives and actions, there is a need to improve the education, counselling, information and research activities already foreseen in the Cooperative Strategy and Action Plan of Turkey.

Educational activities should be conducted to raise awareness about entrepreneurship, partnership culture and cooperatives, beginning in primary schools.

The cooperatives' umbrella organisations should provide their partners with regular training to raise their awareness about the rights and obligations of cooperatives.

Briefing programmes should be organised about cooperatives. The projects of voluntary organisations engaging in training, research and dissemination activities should be supported.

C. INNOVATION, INVESTMENT IN R&D AND ADOPTING TECHNOLOGY

Agricultural enterprises and cooperatives, innovation clusters, non-governmental organisations, research institutes, government agencies and international organisations all play a significant role when cooperating to create and disseminate innovation. Proper institutional incentives, good governance and an enabling infrastructure are all very important for facilitating innovation.

Innovative field-grown food products not only generate increased revenue from the existing demand for these products but also enhance international competitiveness. Since agriculture is often associated with low-margin commodities and decreasing revenue, the potential for innovation in agriculture to make the sector more competitive and also more sustainable is often overlooked. It is important to simplify management and facilitate the coordination of sectorial and multi-sectorial infrastructure development initiatives at the national, regional, provincial and local levels.

The field-grown food sector in the region offers various opportunities for innovation in both products and processes. The market is growing rapidly and provides various opportunities for innovation. Developing markets also demand innovation.
The goal here should be to undertake activities which develop the innovation infrastructure of the food sector in the region. This requires:

- Establishing an innovation structure in the region,
- Building institutional capacity,
- Cooperating with innovation networks,
- Motivating SMEs and institutions for innovation activities.

The first step would be to make the RFNP a part of the business strategy for all the stakeholders in the food sector in the region to focus on innovation and to make innovation successful and competitive.

Managers of SMEs need be trained or coached in innovation management, dissemination and promotion in order to achieve the expected results and bring about innovation in line with the demands of the market.

C.1 Simple actions for developing innovation activities

The actions recommended for the development of innovation in the food sector in the region are described below.
Since coordination among stakeholders is essential, the first recommended action is the establishment of a "Regional Food Innovation Committee". The support of the RFNP and the active contributions of the Implementing Team will be essential for the effective dissemination of innovations. For a functioning organisation, it is recommended that the RFNP should act as the coordinator of the key/primary stakeholders, plan the actions to be taken at the regional level and take charge of technology transfers among local stakeholders and connections with research institutions and universities.

Developing a Regional Food Innovation Policy should provide a general framework for innovation in the regional food sector, facilitating the development of innovation and the participation of relevant parties from all levels of the sector. Within the scope of this innovation policy, the Committee should ensure harmony within the food sector in the region in terms of scope and strategy in order to ensure that common innovation goals are identified, and to encourage the regional food sector to adopt innovation at all levels.

Training will be need to be delivered at all levels of the regional food sector in support of innovation. The training should be designed with a view to equipping and encouraging key/primary stakeholders to think of innovation as a core strategy, and to instil awareness of the fact that innovation is the key to competitive advantage for the food sector in the region. Regional SME managers should ensure and demonstrate leadership and commitment to innovation. Managers should be responsible for the effectiveness of the innovation process and express the importance of innovation.

The Committee should design a training programme to train individuals at all levels about how the main tools and methodologies can be utilised to reach their development goals, to encourage them to develop their own projects and to ensure that they are competent enough to complete them successfully.

Some simple actions that can be put into practice swiftly are:

- Establishment of the "Regional Food Innovation Committee",
- Development of a regional Food Innovation Policy,
- Design of training with a view to training and encouraging key/primary stakeholders, since training will be necessary to support innovation at all levels of the regional food sector,
- Design of a training programme to train people how to utilise the main tools and methodologies to achieve their development goals,
- Provision of support and assistance for the establishment, implementation and continuity of Design and Development (D&D) units,
- Development of an international network for the implementation of innovation strategies,
- Development of proper quality functions at field-grown food SMEs,
- Provision of personnel and training to SMEs so as to transfer technology to the regional food chain,
- Facilitation of the establishment of new SMEs for new initiatives in the food sector,
- Launch of a periodic "Food Innovation Award" competition and ensuring that innovation development achievements are recognised.

C.2 Establishment of the Regional Food and Agricultural Research Centre

There are 49 Agricultural Research Institutes affiliated with the General Directorate of Agricultural Research and Policies of the Ministry of Agriculture and Forestry. These institutes carry out a very broad range of work in the field of agricultural research. In addition, it is recommended that the private sector should establish a university-level Regional Food and Agricultural Research Centre to monitor developments in food production/processing and agricultural production in the region continuously and to support the work being done.

It is recommended that this centre should be established in Gaziantep, which is geographically close to all of the provinces in the project region with large numbers of food-producing SMEs.

The main purposes of this centre should be to conduct scientific research on food and agriculture, cooperate with universities and industry in its fields of study, address and resolve challenges in agriculture and the food industry, manage the implementation of these solutions and, most importantly, to focus on agricultural biotechnology.

In summary, the priorities of the centre should be as follows:

- Planning scientific and technological research that will support the development of agriculture in the region, providing the necessary means and implementing policies in this regard,
- Organising and delivering theoretical and practical training programmes, developing publications, disseminating information and contributing to the scientific research being carried out at universities.
- Conducting research and practical work in areas identified by the industry and other entities, undertaking research on the socio-economic and political changes in the region, developing projects related to food and agriculture in the region and making the necessary preparations for the implementation of the said projects.

C.3 Development of university-industry cooperation

In order to increase R&D and innovation activities in the food and agriculture sectors, resources need to be improved and the effectiveness of the activities conducted under existing structures needs to be strengthened. It is recommended that efforts be made to ensure that existing Technology Transfer Offices, Techno Parks and Incubators operate effectively and to establish other complexes such as Research Parks, Science Parks, Technology Parks and Design and Development (D&D) Centres. The Regional Food and Agricultural Research Centre mentioned earlier is one of these structures.

All these organisational arrangements facilitate the creation of innovative technology by assisting recently-established new technology initiatives or individuals and organisations with simple research-based projects in establishing collaboration with a university or research institute. Projects at research parks, for instance, are supported until such time as a prototype is produced.

R&D activities can make the way in which agricultural production and food processing are organised more efficient and economically effective, increase the quality and suitability of materials used in plant and animal production, and raise the competitiveness of product manufacturers. Once the organisational arrangements described here have been put into effect, R&D and innovation work should be accelerated to develop high quality varieties and types, to support integrated pest control and biological/biotechnical control, to increase the use of forecasting and early warning systems in crop production and to support product diversification and dissemination initiatives through public-private sector collaborations.

In addition, R&D and innovations efforts should be directed towards increased value added and food safety in the food industry, improved packaging of products, including the use of new designs, and the development and diversification of products.

D. BUSINESS DEVELOPMENT

Competitiveness can also be improved through work to be conducted under the following headings:

D.1 Improvements in logistics chains (investment to prevent food waste and loss) and the organisation of intermediary activities

Improvements need to be made in logistics chains (investment to prevent food waste and loss) and in the organisation of intermediary activities. Licensed warehousing should be regarded as a way of improving trade and efforts should be made to make it more widespread and active in practice.

A spot-market agricultural commodity exchange should be established to ensure that supply and demand are met with the minimum level of transaction costs and that the price is determined in a way that will maximise social wellbeing.

Additional steps should be taken to develop the logistics (transport/warehousing) system in the country in the light of a review of good practices. Every effort should be made to ensure that commodity exchanges switch from serving as offices for registration and approval to fulfilling their true role of trading in commodities and facilitating commerce.

As stated in B.1, common facilities could be established to meet the cold storage needs of food sector SMEs in Mersin at a very reasonable investment cost, benefiting both the farmers and the SMEs in the province. This could be achieved through a cluster initiative. It could result in lower energy, labour and logistics costs and significantly increase competitiveness.

D.2 Dissemination and Implementation of Smart Agriculture/Industry 4.0 in Agriculture, Food Safety and Good Agricultural Practices

Ensuring food safety requires multi-stakeholder cooperation to enhance efficiency, to support the necessary investments in agriculture, warehousing, transport and distribution, and to facilitate risk management in the agriculture sector.

Sustainable development is one of today's most important concepts. It refers to the ability to meet the needs and requirements of the current generation without compromising the ability of future generations to meet their own needs. This concept has become a fundamental principle in the food processing industry as well. Sustainable development in the food processing industry raises issues such as organic agriculture, food safety, smart agriculture and food quality.

Meanwhile, supplementary tools such as "smart agriculture" and "good agriculture" can be utilised increase the efficiency of production using sustainable, low-costs, high-quality inputs, resulting in a more competitive food production sector.

In conjunction with relevant stakeholders, the Regional Food Network Platform should establish the necessary infrastructure to carry out training, counselling and advisory activities in order to disseminate knowledge and experience in this area.

The regional directorates of the Ministry of Agriculture and Forestry and the Ministry of Technology in each province could also take up this issue and draw up programmes of awareness-raising, training and dissemination activities. The provincial directorates could assume a coordinating role while the

implementation of the activities could be undertaken by regional NGOs and chambers of commerce and industry, which can be more flexible in policy implementation. The proposed Implementing Team could facilitate the coordination and organisation of these activities.

D.2.1 Implementation of Smart Agriculture/Industry 4.0

Smart agriculture makes use of advanced technologies and modern information systems, including the Internet of Things, to increase the efficiency of agricultural production. It makes the work of producers easier while at the same time increasing efficiency and the quality of the products. Farmers engaged in smart agriculture are able to monitor their fields remotely via a tablet computer or mobile phone, and to keep track of a range of operations from irrigation to soil control.

The benefits of smart agriculture can be summarised as follows:

- It reduces the use of chemicals, resulting in healthier, higher-quality products,
- It lowers the cost of chemicals,
- It reduces environmental pollution,
- It reduces costs,
- It increases soil fertility.

D.2.2 Dissemination of Good Agriculture practices

Good Agriculture is about ensuring the fundamental environmental and operational conditions which are required to produce safe and healthy crops. Good Agriculture provides guidance in utilising the best methods to help reduce the risk of microbial contamination in fruit and vegetables. Good Agriculture practices encompass worker hygiene and health, use of fertilisers, harvesting processes, and water quality.

Growers, packers and transporters are all expected to assume a proactive role in minimising potential food safety risks related to fresh produce. Awareness of the common risk factors addressed by Good Agriculture practices, and the adoption of measures to minimise them, will result in a more effective and coherent response to emerging concerns about the microbial safety of fresh fruit and vegetables. Processors should encourage their partners to adopt safe practices throughout the food chain from the farm to the final consumer, including distributors, exporters, importers, retailers, carriers and service providers.

D.2.3 Using Smart Agriculture/Industry 4.0 in agriculture; Raising awareness of the use of Quality Management Systems, Food Safety and Good Agricultural Practices in the agriculture and food sector

Food safety and hygiene are becoming the two major requirements in the food industry and emerging as a universal problem. Ensuring food safety and hygiene is therefore essential if food sector entrepreneurs are to be able to survive in today's competitive markets.

Food safety is a scientific discipline which defines the use, preparation and storing of food in such a way as to prevent food-borne illnesses. Various routines have to be followed in order to avoid potentially serious threats to health. Food safety often overlaps with food security in avoiding any harm to consumers.

Food safety encompasses both industry and market practices and incudes topics such as food labelling, food hygiene, food additives and the avoidance of pesticide residues. Achieving food safety requires both the use of biotechnology and the adoption of appropriate food policies and auditing and certification systems for exports and imports.

The International Standards Organisation has developed the ISO 22000 standard for the management and assurance of food safety. It has identified the following conditions for a food safety management system:

- Interactive communication
- Systems management
- Prerequisite programmes
- HACCP principles

A food safety management system defines, evaluates and controls food threats at all levels of the food supply chain including component procurement, food preparation, packaging, storing and transport.

Although many exporting companies in the region have ISO 22000 certificates, the importance of this standard still needs to be explained, the relevant personnel need to be trained and the implementation of the standard needs to be monitored. In addition to the efforts of individual companies, a training and counselling pool should be created to support monitoring and inspection activities.

Most food processing companies also have Quality Management Systems in line with ISO 9001. However, these systems are not fully utilised in practice. The Total Quality Management System and Quality Management System are systems which aim to mobilise all the resources of a company to ensure customer satisfaction at the most reasonable price, increase the company's competitiveness and ensure the continuous improvement of products and services as well as human resources. Total quality management can only be implemented in an enterprise successfully if the senior management believes in it and takes a strategic decision to adopt it. Training is needed in order to develop this culture as well as to build efficiency and responsibility at all levels. The success of this cultural transformation requires the company to put certain innovative concepts and practices into effect in the areas of: Customer Orientation; Importance of Quality; Team Work, Work and Training; Continuous Improvement; Management Approach and Trust; Decision Making, Participation, and Social Responsibility. The adoption and implementation of these concepts by all companies could be one of the most important tools for increasing competitiveness.

It is recommended that all field-grown food enterprises should be informed about the Total Quality Management/Quality Management System and trained to put it into practice. Enterprise owners and managers in particular should be trained in these concepts and should make a commitment to implementing them successfully in their businesses.

D.2.3 Supporting and encouraging organic agriculture and organic food

Organic agriculture is a globally growing industry and a profitable and sustainable line of business for agricultural producers who are willing to go through the required certification process to enter this market. Organic production is a human and environment-oriented approach to production which is based on protecting and improving ecological diversity by using the minimum amount of inputs. Consumer and environment-oriented approaches are encouraging consumers to consume and manufacturers to manufacture more and more organic products (İnci et al., 2017: 137). The process of buying organic products starts with perceiving the difference between these products and others. Organic products are preferable to consumers on account of their special characteristics from the points of view of food safety, animal welfare, and environmental protection. All this requires certification. Significant changes have been observed in the consumer demand for safe food in recent years, and the demand for organic products has been increasing throughout the world, including Turkey. Nowadays, consumers want to be sure that the products they will buy are safe and suitable for human health, and they actively prefer products which are manufactured in accordance with these criteria (Eryılmaz et al., 2015: 200; Ilgar, 2017: 161).

The project region is one of the most suitable areas for organic agriculture and food processing. This opportunity provided by the growing market should be utilised effectively. It is recommended that investments should be made in the following activities to disseminate and support organic agriculture:

- Capacity building in farming, processing and marketing,
- Training and counselling.

The project region is very suitable for organic agriculture due to its climate, water resources, and soil fertility and diversity. In order to benefit from this high potential and achieve the same level of performance in organic agriculture as developed countries are achieving, the first thing that must be done is to increase understanding of the importance of the issue. These efforts will need to take the sociological, cultural and economic conditions in the region into account. It is important that the results are shared with economic institutions and stakeholders and a conscious demand is created. In addition, policies should be devised to provide technical and economic support to manufacturers during and after production. Producers who wish to enter the organic production sector and survive in it will need to keep abreast of global developments. They should be provided with financial and technical support, particularly when it comes to marketing and cooperation with other producers. These producers, and SMEs in the various sub-sectors, could be provided with support in creating a regional organic food brand through marketing and promotion activities. Since organic agriculture requires a wide area, producers and SMEs may need to create clusters such as consortia or cooperatives.

Although there are very suitable areas for organic agriculture, especially in Adana, Mersin and Hatay, only a handful of initiatives have been taken so far with respect to organic agriculture and food processing.

D.3 Strengthening Industry 4.0 in the Food Production Sector

The fourth industrial revolution usually refers to the new wave of digital industrial technology. The aim is to create an integrated, automatic and optimised production flow.

The dynamics of Industry 4.0 offers benefits at all levels of the production process including:

Quality: To begin with, the quality of products benefits from additional sensors and actuators monitoring production in real time. In case of a failure, useful information is quickly sent to the relevant receiver.

Efficiency: Efficiency increases not only because automation shortens production time but also because assets are utilised better and inventories are managed better.

Speed: Manufacturers may create a prototype of their new ideas quickly and simulate various scenarios and thereby shorten the time they spend when entering the market.

Flexibility: All of these can be achieved flexibly, using machines and robots which can be easily re-purposed to work on a wide variety of products that can be manufactured in a one-piece flow.

It is recommended to focus on creating an infrastructure that aims to overcome the problems about expertise to prepare companies for Industry 4.0.

Many examples around the world indicate that companies face fewer problems in acquiring the technology necessary to implement Industry 4.0 but encounter a lack of in-house digital culture, vision, training and expertise. For example, if a company does not have a department to track data analytics, this will create a barrier to the implementation of Industry 4.0.

In Turkey, the state has launched various efforts and initiatives for the transformation of companies to Industry 4.0. The Platform for Industrial Digital Transformation supported by the Ministry of Industry and Technology has already prepared a “Digital Transformation Roadmap for the Manufacturing Industry” . This roadmap will provide a good guide and support the activities of the Food Production Sector with respect to digitalisation.

In addition, the Ministry of Industry and Technology is implementing a programme to establish Applied Capability and Transformation Centres in various cities of Turkey. One of these is being established in Mersin, within the project region. It is recommended that the RFNP should develop a joint programme of work with these centres by setting up a structure within the chambers of industry, and engage in capacity building and experience sharing activities for all kinds of digitalisation activities.

D.4 Establishing Business Incubators

Business incubators could be established in cooperation with local youth associations in each province in the region or even with municipalities. This kind of infrastructure may also prove to be a great tool for the economic, social and cultural cohesion of Syrian refugees. People who want to become entrepreneurs, particularly young people and women, should be given easy access so that they can develop their skills or ideas. Two approaches may be employed:

D.4.1 Business Incubators for Innovation and Young Entrepreneurship

One of the aims of this recommendation is to strengthen the younger generation and improve employment opportunities by encouraging their active participation in the economic development of their region. The training offered would develop youth entrepreneurship and their innovation skills, and improve their sense of responsibility. It would also:

- Enhance the culture of entrepreneurship,
- Contribute to the implementation and development of innovative projects carried out by existing initiatives and institutions,
- Launch new initiatives,
- Offer counselling services to encourage the promotion of business innovation processes and methods.

D.4.2 Commercial Incubators for Field-grown Food and Organic Food Processing

One of the aims of these centres would be to assist food processing companies by providing support services for innovation and technology exchange.

Another aim would be to support women in the region who want to run their own businesses by preparing traditional food products. This initiative would also support gastronomic tourism activities in the region.

The incubators would provide professional food processing services for products such as dairy products, fruit juices and beverages, convenience foods, bakery products, meat and seafood products. In addition, there would be an incubator centre that provides services such as research and development, office space and pilot facilities, to assist with the development of business initiatives. This system would support individuals who need help in developing their business ideas to their full potential and turning them into sustainable businesses.

The training, capacity building and mentoring activities to be carried out at these centres would focus mainly on:

- Innovation and business development tools,
- Discovering an individual's innovation skills and talents,
- Well-managed, open innovation processes,
- Developing a precise business model,
- Technological review and discussion of ideas,
- Process facilitation,
- Funding,
- Seeking and matching private partners,
- Administration of management and development projects.

Each province in the project region could focus on the sub-sectors with the highest potential for competitiveness. For example, Hatay might focus on meat and sea products, Adana and Mersin on fruit and vegetables, Gaziantep on bulgur, pasta, grains, pistachios and pulses, and Gaziantep and Kilis on pistachio and olives.

D.5 Innovative product development/ diversification

Product development

The field study conducted in the region gave the impression that companies are not very enthusiastic about developing new products. A number of reasons for this were identified, such as their reluctance to take risks, their belief that such investments are likely to be costly, and their lack of R&D and innovation activities.

However, market dynamics and the rapid technological advances of recent years have forced companies to conduct more research on new product development and product diversification. In this highly competitive environment, the key to corporate growth lies in developing capacity for new product development and achieving success in this area. Companies must differentiate and diversify their products in order to retain their existing customers, acquire new customers, compete more successfully, achieve above-average profitability and survive in the future.

To this end, companies need to take and complete the following steps:

- Identify market opportunities
- Develop concepts
- Evaluate concepts/projects
- Develop products
- Introduce the new products to the market

It is recommended that the training and awareness raising activities to be offered to companies should have a strong focus on product development. It is particularly important that local stakeholders should undertake sector-oriented work to identify market opportunities, keep companies informed and offer encouragement. The initiatives described in Section C are relevant in this regard. Innovation is also important if companies are to take the right steps forward and be steered towards product diversification.

Packaging of Field-grown Food Products

Due to the increased consumer demand for fresh products with long shelf lives and well-controlled quality, packaging requirements have increased and manufacturers need to provide more modern and safe packaging. More than 30% of the food products produced around the world are wasted each year due to lack of proper storage and packaging facilities. The current approach to increasing global food security prioritises reducing food damage and waste during storage. It is therefore very important to invest in developing new technologies for food packaging.

Plastics are the dominant food packaging materials. Existing plastics are slowly being replaced by bio-based polymers in the packaging of various food products such as bread, beverages, eggs, juices, meat and fizzy drinks.

Biopolymer based food packaging is a rational approach, especially for developing countries such as China, India and Brazil, since it can be produced from low-cost raw materials such as wood waste and molasses. The majority of R&D activities focus on developing the mechanical qualities and resilience of various biopolymers through the addition of various additives and plasticisers. Meanwhile, consumers display a preference for the greater transparency offered by smart packaging that allows for visual authentication and shows the state of the product. Both the developers of packaging materials and the consumers are in favour of reducing food waste. Consumers also demand environmentally friendly, sustainable packaging and many are willing to pay extra for this, since they are aware of the negative effects of plastic packages. Companies wishing to stand out from the crowd in global competition need to be aware of these issues and to take steps to meet the market's requirements. They could also be guided towards investments in the manufacture of these new packaging materials, which are currently not produced in the region.

E. IMPROVING MARKET ACCESS VIA INTERNATIONALISATION, CREATING AND MARKETING A REGIONAL BRAND

In order to increase its exports, the food sector in the region needs to develop suitable marketing strategies for the internationalisation of SMEs by promoting clusters and networks and adopting innovative exporting practices. As a prerequisite, the regional food sector should act to raise awareness among industrial agriculture actors and SMEs of the opportunities provided by internationalisation strategies.

Internationalisation means more than just exporting, and relevant strategies and supportive measures should extend towards other forms of internationalisation as well. In our case, the regional food sector should make an effort to strengthen the food value chains operating in the region, bringing them together and facilitating cooperation among them with a view to the establishment of SME joint ventures aimed at target export markets. This process

should include internal and external strategies.

The internal strategy would pay attention to strengthening export-oriented value chains and the business environment in the domestic market by strengthening the supply of existing support services, mapping them and identifying ways of devising support plans to ensure that SME exports are more consistent.

The analyses clearly point to a need to strengthen information and counselling services for SMEs with a potential to trade across borders. In this context, considerable support should be made available to SMEs, particularly those who are thinking of going international for the first time.

The external strategy involves the sector gaining initial access to the priority markets and organising activities in these markets in line with sectorial marketing strategies while at the same time seeking to eliminate any barriers to international trade.

E.1 Branding, Marketing, Supportive Services for Foreign Trade

This service will be quite valuable and will accelerate the regional development of the sector. The field-grown food sector should therefore develop a marketing counselling service programme to support SMEs. This service programme could include the following;

- Market research,
- Marketing planning,
- Product and packaging design,
- Preparing products for markets,
- Brand management,
- Strategic communication management, and Media planning and advertising management

E.2 Establishing a network system for SMEs by creating a joint e-commerce/ online sales platform to promote exports

The stakeholders of the regional food sector should seriously consider promoting the establishment of SME business networks to support exports further by building relationships and exchanging information and business experience. Since the regional food sector stakeholders have the capacity to reduce the barriers to internationalisation for smaller companies, SMEs should take measures to promote the use of e-commerce and the Internet.

The development of an online regional food portal, a digital platform for the promotion of regional food sector and SMEs, would improve access to services and information in areas like basic sectorial data, international marketing standards, market prices, market trends and analysis, commercial opportunities, export procedures, transport procedures, financial opportunities and sectorial communication.

The online regional food portal should provide a commercial web portal that aims to:

- Include small and medium-scale regional food exporters into the export value chain,
- Facilitate commercial opportunities by ensuring the exchange of information between the regional and international food markets.

This platform could be coordinated by the RFNP and established at the Gaziantep Techno Park from where it could serve the whole region.

E.3 Marketing of Ethnic and Traditional Food

E.3.1 Food and Gastronomic Tourism

The region has a high potential for gastronomic tourism. Each city in the project region has its own specific dishes and desserts and all of these local dishes can be regarded as important tourism assets. The local foods, desserts, beverages and other products could be powerful tools for turning the region into a centre for tourism, including rural tourism, thereby creating employment opportunities. They can also play a role in reinforcing the region's image, contributing to the marketing of the region, protecting its cultural heritage and raising the recognition level of local food products. They will stimulate the food and beverage sector first and then other sectors, with positive impacts on employment and the economy.

There are already some significant initiatives in some cities of the project region. For example, Gastroantep in Gaziantep has been operating successfully in recent years and has had a very positive impact on local food marketing as well as rural development. However, further improvements are possible. For example, a gastronomy route could be developed within the region through the joint efforts and initiative of the various cities.

As mentioned above, this approach would create strong employment opportunities. Syrians may also participate as entrepreneurs.

E.3.2 Geographical Indication (GI) certificates

Geographical Indications (GI) are a rising trend under intellectual property rights. They are defined as indications used for products that have a specific geographical origin and therefore boast superior qualities linked to this origin.

Their benefits can be summarised as follows:

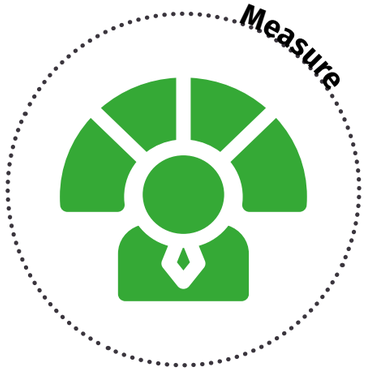
- An important marketing tool,
- Protecting and increasing value,
- Increasing exports, revenues and employment,
- Development of regional tourism,
- Economic reinforcement of rural communities.

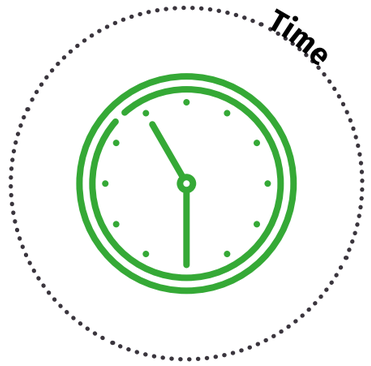
Geographical indications are an important topic for the European Community. GI products spark manufacturers' interest because consumers desire diversity, because manufacturers gain value based on typical and high quality products, and because they constitute the foundation of the EU's quality policy for agricultural products. Many of the success stories in the agriculture and food sectors in EU countries are based on the contribution of GI in the marketing of products. When investing in GIs, it is important to focus on a variety of products. Current GI activities for the various food products of certain regions and provinces (e.g.: Antep bulgur, Antep baklava, Adana kebab) are limited to the market in Turkey. In order to attain international competitiveness, more effort should be directed towards the more difficult task of acquiring international GI certification.

5.1 Recommendations for Sector Strategy and Action Plan

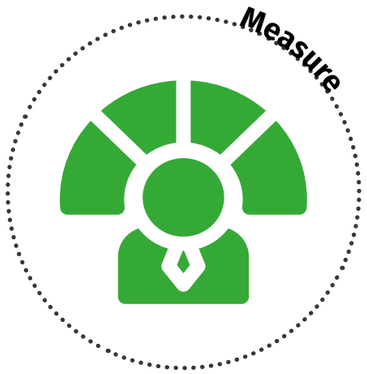
(Actions, responsibilities and time plan for public entities and other sectorial actors to accelerate activities for adapting to sectorial trends and transforming the sector)

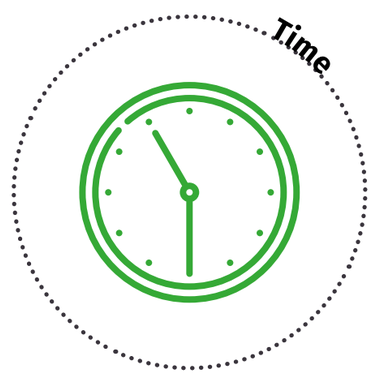
Development Area: A - ORGANISATION AND CAPACITY BUILDING





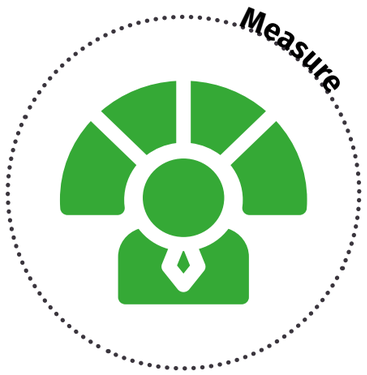
A.1 Local and national level organisation	A.1 Identification of Local Stakeholders in each city and establishment of Sectorial Network Platform (Regional Food Network Platform)	Ankara/Project Region	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders	Within the first 6 months
A.2 Developing a regional and national infrastructure	A.2.1 Ensuring coordination among relevant regional institutions in the food, beverage and agriculture sectors as well as with government entities A.2.2 Improving the existing legislation to support the development of agriculture and food industry and its cohesion with new sectorial trends	Ankara/Project Region	Sectorial Network Platform	Within the first 6 months

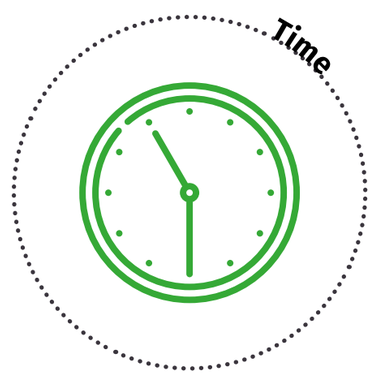




A.3. Institutional capacity building	A.3.1 Enhancing the capacities of institutions in the agriculture and food sector; ensuring the sustainability and effectiveness of training and counselling activities A.3.2 Establishing and implementing a training and certification infrastructure to train qualified personnel and intermediate personnel (investment in human capital)	Project Region	Sectorial Network Platform Roadmap Implementing Team	Within the first year
A.4 Increasing the impact of the support and incentives provided for the agriculture and food sector and ensure their effective distribution	A.4.1 Supporting clustering and cooperation activities A.4.2 Supporting contract agriculture A.4.3 Reviewing existing incentives to acquire more effective results in terms of efficiency and competitiveness in the sector	Project Region Ankara/Project Region	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	Within the first year
A.5. Devising policies to reduce input costs in agricultural production and food industry	A.5.1 Policies for agricultural production inputs A.5.2 Plans for energy costs in agricultural production and food production sectors	Ankara/Project Region	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform	Within the first year

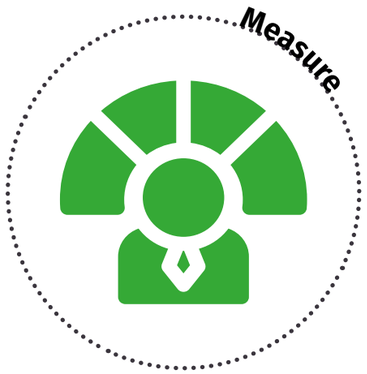
Development Area: B IMPROVING COLLABORATIONS

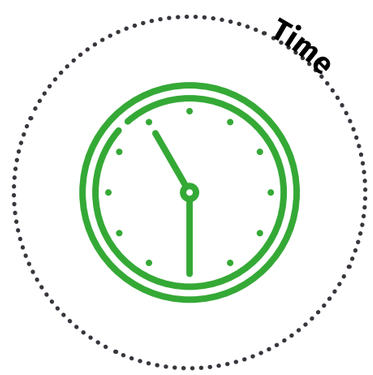




B.1 Improving field-grown food, business and industry clusters among SMEs and manufacturers	B.1.1 Supporting the preparation of cooperation policies B.1.2 Setting the environment for commercial collaborations and building trust among the target group B.1.3 Raising awareness of the benefits of cooperation and motivating the target audience B.1.4 Supporting the commercial collaborations of manufacturers and SMEs about their initiatives on fruits, vegetables and field crops	Ankara/Project Region Each province in the project region Adana, Hatay, Mersin	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	In 2 years In 3 years
B.2 Encouraging the establishment of field-grown food cooperatives and support their activities	B.2.1 Review successful examples of cooperatives B.2.2 Review the legislation of cooperatives B.2.3 Raise awareness on the benefits of the cooperative business model and supporting the development of sectorial actors B.2.4 Organising trainings and seminars for manufacturers and SMEs	Ankara/Project Region Each province in the project region	Sectorial Network Platform Roadmap Implementing Team	In 2 years

Development Area C. INNOVATION, INVESTMENT IN R&D AND ADOPTING TECHNOLOGY

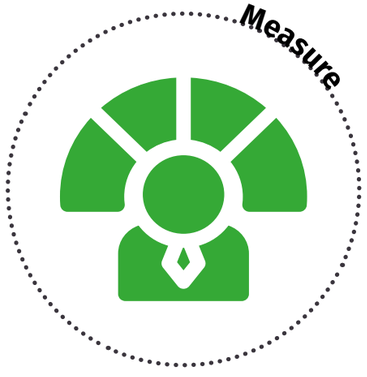


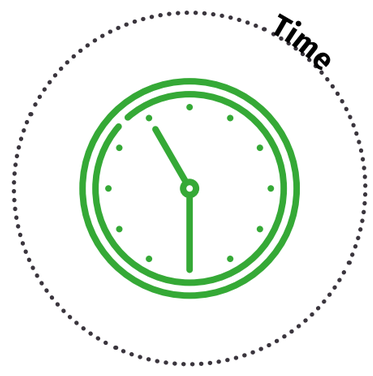


Measure	Activity	Place of Activity	Institution in Charge	Time
C.1 Simple actions to develop innovation activities	C.1.1 Coordination among stakeholders and establish the “Regional Food Innovation Committee” C.1.2 Developing a regional food innovation policy C.1.3 Training to support innovation at all levels of the regional food sector C.1.4 Designing training programmes to implement main tools and methodologies for the improvement targets C.1.5 Support and assistance for the establishment, implementation and maintenance of design and development (D&D) units in food producing SMEs C.1.6 Developing an international network for the implementation of innovation strategies C.1.7 Developing suitable quality functions for the personnel in food producing SMEs and their training C.1.8 Supporting the development of new SMEs in the food sector through a start-up facilitation strategy and other tools designed to promote the establishment of new SMEs C.1.9 Initiating a “Food Innovation Award” aimed to define, promote, select and award the most innovative initiatives accepted by regional food producing SMEs and thereby recognising improvement	Gaziantep, Adana, Hatay, Mersin, Kilis	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	In 2 years

Measure	Activity	Place of Activity	Institution in Charge	Time
C.2 Establishment of the Regional Food and Agricultural Research Centre	C.2.1 Identifying locations and participating entities C.2.2 Preparing the infrastructure for the centre	Gaziantep	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	In 2 years
C.3 Developing the university-industry cooperation	C.3.1 Ensuring coordination among partner entities C.3.2 Identifying the areas of cooperation and relevant institutions C.3.3 Raising awareness among sectorial actors C.3.4 Initiating work on possible projects	Gaziantep Hatay Kilis Adana Mersin	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	In 2 years

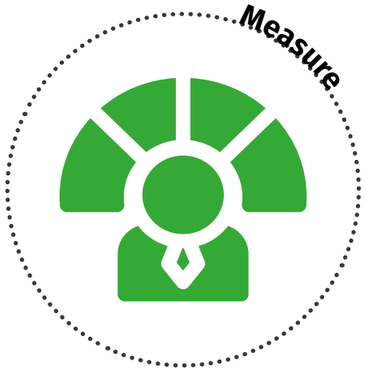
Development Area: D. BUSINESS DEVELOPMENT

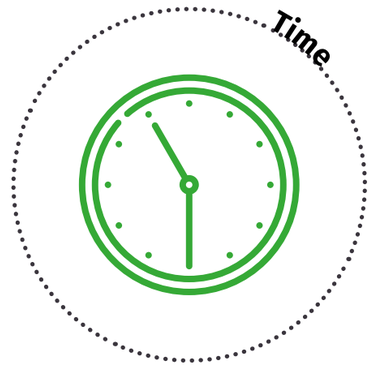




D.1 Improvements in logistics chains (investments to prevent food waste and loss) and arrangements in intermediary activities	Establishing shared cold storages Creating a commodity exchange for fruits and vegetables	Mersin Adana	Ministry of Agriculture and Forestry and Provincial Directorates of Agriculture and Forestry Local Stakeholders Sectorial Network Platform Roadmap Implementing Team	Within the first year
D.2 Dissemination and Implementation of Smart Agriculture/Industry 4.0 in Agriculture, Food Safety and Good Agricultural Practices	D.2.1 Implementation of Smart Agriculture/Industry 4.0 D.2.2 Dissemination of Good Agricultural Practices D.2.3 Using Smart Agriculture/Industry 4.0 in Agriculture; Raising awareness of the use of the Quality Management System, Food Safety and Good Agricultural Practices in the agriculture-food sector; Ensuring training and counselling D.2.3 Supporting and encouraging organic agriculture and organic food	Gaziantep Adana Mersin Hatay Kilis	Sectorial Network Platform Roadmap Implementing Team	In 2 years
D.3 Strengthening Industry 4.0 in the Food Production Sector		Gaziantep Adana Mersin Hatay Kilis	Sectorial Network Platform Roadmap Implementing Team	In 2 years
D.4 Establishing Business Incubators	D.4.1 Business Incubators for Innovation and Young Entrepreneurship D.4.2 Commercial Incubators for Field-grown Food and Organic Food Processing	Gaziantep Adana Mersin Hatay Kilis	Sectorial Network Platform Roadmap Implementing Team	In 2 years

Development Area: E. IMPROVING MARKET ACCESS VIA INTERNATIONALISATION, CREATING A REGIONAL BRAND AND MARKETING



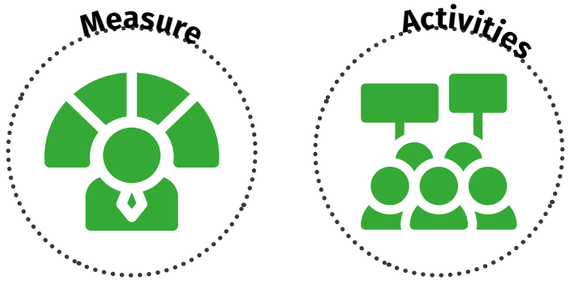


E.1 Branding, Marketing, Supportive Services for Foreign Trade		Gaziantep Adana Mersin Hatay Kilis	Sectorial Network Platform	In 2 years
E.2 Establishing a network system for SMEs to promote exports		Gaziantep Adana Mersin Hatay Kilis	Roadmap Implementing Team	In 2 years
E.3 Creating a joint e-commerce/online sales platform		Gaziantep Adana Mersin Hatay Kilis	Sectorial Network Platform	In 3 years
E.4 Marketing of Local Ethnic and Traditional Food	E.4.1 Food and Gastronomic tourism E.4.2 Certification for Geographical Indication	Hatay Adana	Roadmap Implementing Team	In 2 years

5.2. Recommendations for the Sector on Labour Absorption Strategies

A number of programmes and projects are already under way with the aim of integrating Syrians and members of host communities into the workforce. These efforts range from the development of policy recommendations for the economic integration of this group to activities currently being conducted as part of the support provided to Syrians by the Turkish government. Since long-term measures require long-term policy changes, this document will recommend only short and medium-term measures. Most of these measures can be put into practice the RFNPs referred to above.

Recommended measures and activities



Legal arrangements	
	Making it easier to obtain work permits
	Reviewing the legislation on working conditions and the minimum wage
	Implementing employer-oriented support programmes for the employment of Syrians and host community members
	Establishing a separate body in each project province, in addition to ISKUR, specifically for the economic integration of Syrians and host community members, with a focus on effective activities for the employment of members of these groups: This body could function as a centre that provides information about aspects of the labour market such as work permits and other regulations affecting Syrians and members of local communities and clarifies and disseminates information about the rules for employing Syrians.
	Reducing restrictions on the sectors which may employ Syrians
	Increasing awareness on available governmental incentives for the employment which could be benefited for Syrians and also other incentives provided in the framework of Projects conducted by UN Agencies and NGOs.

Matching talents and needs

Determining and evaluating the knowledge and skills of the Syrians in order to guide and develop a proper method of matching employees and employers:
It is very probable that Syrians have greater competences (knowledge of a foreign language, higher education, etc.) and experience that are in line with the needs of local employers for technical jobs, marketing, exporting and so on. Organising fairs which bring employers and potential employees together would be an effective way of meeting the needs of both sides.

Focusing on business language training:
Although Turkish language training programmes are being provided by government entities, Syrians may need additional language courses for the purposes of employment, working life and their professions. These additional language courses, which could be financed by chambers of commerce and industry, would fill potential gaps in the programmes financed by government entities. They would assist in meeting the specific language needs of individual refugees and ultimately the needs of employers. Another approach could be to integrate language courses into vocational training programmes, to help the refugees understand the terminology used in the workplace.

Offering needs-based training:

When designing a training programme, the existing skills and backgrounds of the participants should be recognised. While most of the Syrians who take part in training courses have some relevant skills for services or manufacturing work, there are also those who do not have such skills. Examples include people who have only worked on their own farms throughout their lives, and women who never participated in the labour force in Syria. Training should therefore be organised based on actual needs, including:
• the skills required in the region (to be determined in cooperation with employers and entities such as chambers of commerce and industry). These may include maintain machinery, operating construction equipment operation, and building maintenance and facility management (plumbing, carpentry, electricity),
• entrepreneurship skills and business ideas
• short-term vocational training
• orientation training for beneficiaries already possessing skills

Evaluating and certifying the skills of employees:
Many potential employees have skills which they are not able to certify and which are therefore not recognised by employers, making it harder for them to find jobs.

Sector-specific activities

Agricultural activities:

- Selecting Syrians who have previously worked in agriculture (farmers/breeders and others engaged in agricultural activities)
- Providing support for those wishing to own or rent land and obtain agricultural inputs (seeds, fertiliser, tools, livestock)
- Offering training or guidance on vocational and skills development training for agricultural technologies, agricultural business development and sales and marketing
- Matching producers with buyers (food manufacturers, retailers, wholesalers etc.)

Developing skills for employment in the field-grown food sector:
- Providing basic communicative language courses for potential employees
- Offering special vocational training courses in various aspects of food and agriculture (orchard/forest management, harvesting, greenhouse operation and post-harvest processing, hygiene, quality etc.)

Entrepreneurial activities:
Providing additional support mechanisms to enable Syrian refugees to develop and make use of their entrepreneurial skills, for example by:
-Offering guidance and training on entrepreneurship in commerce and establishing centres within the offices of chambers of commerce to provide individual counselling services on establishing a business and preparing feasibility/business plans
- Creating funds to encourage entrepreneurship through low-interest loans
- Prompting sponsorship activities for large companies to initiate social responsibility projects

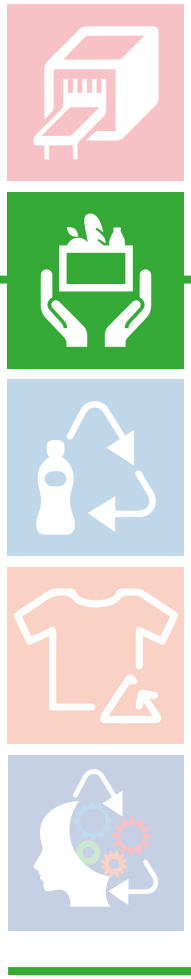
Preparing the business and employment environment

Building empathy and trust between the local community and employers:
Awareness should be raised among the local community and employers to avoid negative perceptions of refugees and prevent their marginalisation. Such activities could be undertaken not only by NGOs but also by local authorities, chambers of commerce and industry, employer representatives and other institutions.

Turkey Resilience Project in Response to the Syria Crisis (TRP)

JOB CREATION COMPONENT

2020



Sectoral Roadmaps: **Food Sector in Turkey**