

# **National and International Agricultural Policy in the Post-pandemic Period**

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## National and International Agricultural Policy in the Post-pandemic Period<sup>1</sup>

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### **Abstract**

The COVID-19 pandemic caused mobility to decrease and thus economic activities to shrink. Agricultural sector has also been adversely affected, particularly due to disruptions in the food processing and provision, economic contraction, and difficulties in accessing food. However, due to the specific characteristics of agriculture, contraction was less than other sectors. Turkey, given the variety of products being very climate of agriculture; market viability due to high demand for food products; agriculture is open to development; being close to countries with high imported food consumption; ancient agricultural culture and endemic species richness; by using the advantages well, the pandemic can be turned into important opportunities. In this section, evaluations are made by taking into consideration the specified advantages of the agricultural sector and associating them with the pandemic, and suggestions are presented for the future. Self-sufficiency in food supply, which stands out with the pandemic, will be achieved by supporting the advantage of product variety with advanced technology. Increasing tendency to access more natural, cleaner and halal food caused by the pandemic will highlight sustainable agricultural policies. The tendency to prefer rural life, which has been observed to be strengthened by the pandemic, will support reverse migration if supported by improving working and living conditions in the rural. Online digital technology solutions for provision of food forced by the pandemic will be an important tool in eliminating the current problems of the food value chain. The fall in prices due to the contraction of demand for food will requires Turkey increase food exports by using the advantage of being close to the countries depending import in food consumption. Increasing social awareness of the strategic importance of agriculture will be helpful in eliminating main problems of agriculture and the rural.

### **Keywords**

*Agriculture, COVID-19, Turkey, agricultural policies, advantages, opportunities*

<sup>1</sup> This study is a translation and updated version of the paper previously published in the book titled "Küresel Salgının Anatomisi: İnsan ve Toplumun Geleceği" by TÜBA in June 2020.



## **Introduction**

Agriculture that exists with human beings is called for crop and animal production and small-scale product processing activities to meet the compulsory needs by using soil and seeds. Type of agricultural activities, technologies used and understanding of agriculture are rapidly being changed. Despite the expression “using soil and seeds” in the definition, today, we can produce soilless and even seedless crop production. Besides soil and seed, water and solar energy gain more importance in agriculture and thus production can also grow vertically. While family business maintains its importance, the trend towards mass agricultural production is increasing. Sustainable agriculture, rural development, food safety<sup>2</sup> from farm to fork and good agricultural practices take place more on the agenda. In addition to these, after the COVID-19 pandemic, self-sufficiency tendency will come to the fore in food production.

A New Zealand three-person family farm who produce large quantities of kiwi, avocado and corn only makes business decisions and gets her business in the field done by professional firms. In Saudi Arabia, a large dairy farm has 85,000 dairy cows, and can produce an average of 41 liters of milk per cow per day in the middle of the desert, with four milking per day. Farmers in Japan can produce seedless crop production on the water by vegetative reproduction method. A farmer producing soybeans and corn in the United States is able to sell his product, which has not yet been produced in the futures markets by phone or online. A Finnish dairy producer, using an automatic milking system where cows that need to be milked are milked by their will, establishes the welfare of the animals. In Italy, a family farm can both offer and sell her products to the customer who came to the highland by processing the milk they obtained from their cows into butter and cheese, on the rental plateau where she went for three months in the summer (Yavuz, 2017a). These forms

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<sup>2</sup> Food safety means high quality and reliable foods that are suitable for health in terms of content.

of agricultural activities, which can be given many different examples, show the wide range of technology use and application differences in agriculture. These differences, which are the products of the human mind, point out that many more expansions can be made in agriculture.

Turkey's agriculture has the advantages of product diversity provided by climate differences, rich gene resources, ancient agricultural culture, and market vitality due to increasing population and income, and proximity to the countries with high food consumption based on imports. Turkey that has not reached the desired level of productivity in terms of food security<sup>3</sup> and the presence of important problems in food safety from farm to fork<sup>4</sup> requires using of these advantages. Since the rural life and work conditions are not good enough, the young and qualified population is leaving the countryside. A human-oriented approach to solving problems in agriculture has been overlooked and focusing more on technical problems has prevented a holistic approach and thus the desired level of success has not been achieved. The yield gap<sup>5</sup> remains more or less in most production areas. In addition to these advantages, increasing social awareness of strategic importance of agriculture because of COVID-19 pandemic may provide an opportunity to solve these problems with a holistic approach.

Although the use of fast-renewed technologies in agriculture is one of the basic conditions for increasing efficiency and thus eliminating the yield gap, the main difficulties in solving the technical problems of agriculture are knotted on socio-cultural, socio-economic and direct economic problems (Ülkümen, 1966). These social, cultural and economic problems of agriculture still prevent to solve technical problems. Without having a better living and working conditions in the rural areas, agricultural supports that are met at farm level and valued price and market security for agricultural products, the desired level of technology will not be achieved in agriculture. Besides, it is clear that rural development and agricultural growth will not reach the desired level without developing systems that will activate the material and moral power of rural residents and agricultural producers. Therefore, it is necessary to approach the problems of the agricultural sector with a holistic and multi-solution approach that puts people at the center.

The importance of policies to improve agriculture stems from the fact that it responds to a mandatory need such as the nutrition of the society. The verses of the Qur'an in Surah Yusuf, stating that the wheat was stored and distributed to the people at scarce times, and the words of Confucius, which explains how long a state can last depends on how many years the food stock lasts, pointed to the importance given to agriculture in the past (Yavuz, 2015). Today, on the one hand, hunger and poverty in many countries of the world, on the

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<sup>3</sup> Food security corresponds to the amount of food that meets the needs and guarantees the nutrition of the public.

<sup>4</sup> The concept from farm to fork / table is used to emphasize food safety. It is the process from agricultural production to processing, packaging, storage and sales to consumption.

<sup>5</sup> The yield gap is the difference between the yield that can be obtained from the unit and the animal under ideal conditions and the current yield.

other hand, food shortage crisis experienced even in the richest countries, such as the embargo made to Qatar, clearly reveals the importance of correctly structuring policies towards agriculture and the food sector. This importance will increase further in the future due to the constant agricultural production resources despite the rapidly increasing world population. The difference in development between the countries of the world is because these countries produce correct and disciplined economies and thus agricultural policies and practices rather than the wealth of natural resources. In countries such as Turkey where the share of non-agricultural sector exceeds 93 % of the economy, economic growth will increase agricultural domestic demand, have advanced institutions, establish advanced infrastructures for agricultural production and marketing, and thus have a role that enhances the agricultural sector. Therefore, a wider and holistic approach to the problems of agriculture is necessary rather than the understanding that connects all successes and failures to agricultural policies and agricultural supports.

In this book section, it is aimed to produce versatile solutions for the basic problems of agricultural sector with the concept of sustainable agriculture by making use of growing social awareness of strategic importance of agriculture during COVID-19 pandemic and advantages of Turkey's Agriculture. In line with this perspective, the existing structure of agriculture and the current agricultural policies will be re-examined within the framework of the opportunities created and will may be created by the COVID-19 pandemic, and if necessary, policy changes and new policy actions in terms of improvement will be foreseen. In the second part of the book section, the global food supply security, potential of Turkey's agriculture under the sub-heads of crop production, animal production and food products and beverages manufacturing and rural development and natural resources policies in relation to the new situation created by the COVID-19 pandemic will be explored extensively. In the third part, global developments and expectations during and after the pandemic, precautions and policies on a global and national wide, and policy suggestions that can turn the crisis into opportunities will be presented.

### **Overview of the Situation Before the Pandemic**

To expose the possible effects of the pandemic in a better way and to see and assess the opportunities that will be created by the pandemic and to provide foresights with respect to these opportunities, it will be useful to examine the global food security situation, the potential and current situation of Turkey's agriculture and rural development and natural resource policies by relating with COVID-19 pandemic.

## Global Food Supply Security and Safety

The constraints of agricultural production for the growing world population have been a source of debate and concern since the past. Tertullian<sup>6</sup> brought the issue to the agenda in the 3rd century first, followed by Malthus<sup>7</sup> in the late 18th century, and the debate continued with Paul Ehrlich's<sup>8</sup> "population bombardment" more recently. However, with the use of mechanical and chemical, then biological and recently digital technology in agricultural production, food production has not only increased much faster than the population, but also per capita food consumption has increased. In addition to these technological innovations, a process leading to smart technology production systems with satellite support in farm management and the latest developments in agriculture 4.0 offer important opportunities in reducing costs, increasing productivity, and increasing quality.

The global population increased by 3.2 billion in the forty years between 1970-2010 and reached 6.9 billion. This population is projected to increase by only 2.15 billion to 9.15 billion in the forty years between 2010-2050. This decrease in the global population growth rate indicates that the increase needed in agricultural production will decrease in the future. Considering the estimation that per capita income will increase by 1.8 times in the next forty years, it can be predicted that the demand for animal feed, land and water resources to be used in their production will increase (Alexandratos & Bruinsma, 2012). Although it is thought that the use of corn, sugar cane, vegetable oils and cereals in biofuel production is beneficial for producers, it is highly likely that low-income people will suffer from this development. On the one hand, while agricultural resources are demanded for the production of crops used in fuel production, on the other hand, the risk of food security for countries due to the COVID-19 pandemic raises self-sufficiency and the sustainable use of resources by emphasizing sustainable agriculture.

In general, sustainable agriculture means using a wide range of solutions including nature and technology (CropLife, 2012). Sustainable agriculture is to meet the increasing global food demand, to maintain environmental quality and protect natural resources as well as to achieve effective use of advanced technologies, renewable natural resources, and on-farm resources by considering natural biological cycles. Many global developments affect food security and the overall sustainability of agricultural systems for food production. It is estimated that there will be a significant increase in the demand for agricultural products if the global population reaches around 10 billion by 2050. On the other hand, based on 2013, economic growth is projected to be 50 % by 2050. The increase in income in developing countries will increase the consumption of meat, fruits and vegetables compared to cereals and cause a shift in food preferences and thus more pressure on natural resources (FAO, 2018). Therefore, sustainability will gain more importance in agriculture.

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<sup>6</sup> Christian religious scientist Tertullian (MS 160-220).

<sup>7</sup> Economist Thomas Robert Malthus (1766-1834).

<sup>8</sup> Medical Scholar Paul Ehrlich (1854-1915).



The vital elements of food systems, especially seeds; it becomes capital-intensive, vertically integrated and less aggregated, that is, monopolized. In this case, small-scale producers and landless families will be the first losers and will increasingly seek employment opportunities outside agriculture, as a result of the migration of men in rural families, “women” in farming will occur in many regions of the world. Although hunger and extreme poverty have been reduced globally in the past 30 years, around 700 million people, most of whom live in rural areas, are still very poor today. Despite the undeniable improvement in reducing malnutrition and improving nutrition and health levels, around 800 million people are chronically hungry. About two billion people are faced with a lack of micronutrients. If additional efforts are not made to support pro-poor growth, by 2030, 653 million people will still be malnourished.

Global conflicts, crises and natural disasters increase in number and intensity, reducing food production, disrupting access to food and healthcare, pushing a large number of families affected by crisis and natural disasters back to poverty and hunger, fueling the heartsickness migrations, increasing humanitarian aid and weakening social protection systems. The proportion of people living under the starvation limit in low-income countries subject to crises for a long time, is 2.5 to 3.0 times higher on average than in other low-income countries.

These global developments cause many challenges for food and agriculture and require multidimensional measures. With the use of technology, it is necessary to implement innovative systems that increase productivity in production while preserving and improving natural resources. There should be a transformative process for “holistic” approaches such as ecological agriculture, agroforestry<sup>9</sup>, climate-friendly agriculture, good agriculture and protective agriculture based on local and traditional knowledge. Technological advances help intensify natural hazards that affect all ecosystems and all aspects of human life, as well as climate change. Further international cooperation and effort are needed to prevent cross-border agricultural and food system threats through pests and diseases that cross country borders.

It is essential to rethink food systems and management to overcome existing and potential challenges. All countries are interdependent in the path of sustainable development. This requirement was seen much more clearly during the COVID-19 pandemic. Sustainable development is a perspective that goes beyond the division of countries with its “advanced” and “developing” approach. Sustainable development, which requires fundamental changes in the production and consumption of all societies, is a universal imperative and a shared responsibility for all countries. This responsibility is also an approach that takes into account Turkey to look again to agriculture and agricultural know-how Turkey has is necessary to move beyond the borders of the country in this direction.

<sup>9</sup> The agricultural system in which crop and animal production, tree and other similar forest products are produced together is called agroforestry.

On the one hand, while countries that have yield gap problem in agricultural production widespread the use of productivity-enhancing technologies without compromising food safety, on the other hand, countries that have sufficiently covered the yield gap should focus on environmental friendly alternative agriculture. In this way, it will be the best approach to try to balance the world in terms of sustainable agriculture. In this context, Turkey that has the potential to make very significant progress both within and outside the country must mobilize this potential in benefiting from the opportunities created by the COVID-19 pandemic.

### **Potential of Turkey's Agriculture and COVID-19 Pandemic**

The total value of agricultural production in Turkey, ranged from 6 % to 3 % of the world according to different calculations. Turkey, in terms of agricultural production value of 51.7 billion dollars is among the world's top 10 agricultural producer (FAOSTAT, 2020). The share of agricultural production value in GDP has decreased from 15.4 % to 6.3 % in the last quarter century. This downward trend is an indicator of development as it brings it closer to the share in developed countries.

Turkey lags behind developed countries in terms of yield per unit area and per animal in the majority of crop and animal production, respectively (FAOSTAT, 2020). On one hand, Turkey gets closer to the countries with high yield in corn and sunflower, on the other hand, lags a little behind of these countries in sugar beet yield. Turkey, being a good wheat producer in the world lags far behind the developed countries in per hectare yield of wheat excluding Russia. Turkey, that gets closer to the northern European countries including Russia in meat yield per cattle, lags behind many European countries in milk yield per cow, especially the United States. This information shows that high yield gap in both crop and livestock production of Turkey. It therefore reveals how important it is to develop not only productivity, but also low-cost production systems in Turkey.

Turkey's agriculture has many advantages that are (1) diversity in agricultural production because of the regions with different climates, (2) agricultural market viability resulting from rapidly increasing population and increased demand per capita, (3) closeness to the countries with high food consumption due to imports, (4) enhancement caused by the elimination of current structural problems, especially the yield gap, (5) having important gene resources and (6) embracing the ancient agricultural culture (Yavuz, 2017b). These advantages can carry Turkey into a place where Turkey can play an important role in ensuring the national and international food supply and demand balance.

Climatic differences in different geographical regions of Turkey cause diversity in agricultural production. The variety of products provides important advantages to the agricultural sector. By producing multiple products, a farm

can reduce the damage caused by a product due to its adverse climatic or market conditions from other products produced. Likewise, the risks in the agricultural sector in a country decreases due to the production environment with this diversity. On the other hand, climate diversity enables the development of trade between the regions that concentrate on the production of different products, thereby increasing the vitality in agriculture and economy. Moreover, this diversity enables Turkey achieving self-sufficiency in food production and food consumption and contributes to the reduction of dependence on foreign agricultural products. Product diversity advantage also contributes self-sufficiency in food that became an important policy after COVID-19 pandemic.

The increase in the population, the number of foreign tourists and immigrants, and the per capita income of the Turkey in the last fifteen years have led to an increase in the domestic demand for agricultural products and thus the viability of the agricultural sector. Increases in population, foreign tourists and immigrants naturally increase food consumption at the same rate. On the other hand, rising per capita income in terms of purchasing power parity plays an important role in closing the gap in food consumption, especially animal products, in other words, increasing food consumption per capita. Thus, unlike developed countries, income growth in Turkey increases primarily food consumption, mainly in meat and dairy products and keep alive the agricultural sector. Since the stop of tourism due to the COVID-19 pandemic and the decrease in income due to the contraction in the economy will adversely affect the occurrence of this vitality, efforts to increase exports, will be beneficial until the effects of the pandemic pass.

Turkey can take an important role in the balance of the world food supply and demand after COVID-19 pandemic by increasing its production that would meet the increasing food demand within the country besides agricultural exports. Closeness to the countries with high import-based food consumption and the difficulties experienced after COVID-19 by small and / or island countries whose economy depends on Tourism and food consumption totally based on import provide significant export opportunities for increasing agricultural production potential.

Although the structural problems suitable for improvement, such as the productivity gap experienced in many crop and animal production, are considered as a disadvantage, but they offer important opportunities for the rapid development of the agricultural sector in case of solution. Important genetic resources and ancient farming culture in Turkey, is an important potential especially for improving local seed production and breeding because of self-sufficiency policy that became important after the COVID-19.

If Turkey approaches the agricultural sector by being aware of these advantages, it remains not only to have a growing economy, but also to produce correct agricultural policy actions and to implement these policies in a disciplined

manner. The crises in food production and especially in accessing to food during COVID-19 pandemic could be converted into opportunities by using these advantages so that Turkey takes more important position in national and international food supply-demand balance.

### *Crop Production*

In the last 15 years, an increase of approximately 25 % in plant production occurred. The fruit and vegetables included in this production increased 55 % and 20 % respectively (T.R. Agriculture and Forestry Ministry, 2020). These increases are much higher than the population increase of about 14 % in the same period. In the same period, there was a decrease in the cultivation areas of wheat, barley, cotton and sugar beet, while an increase occurred in corn and sunflower (FAOSTAT, 2020). Despite these reductions in the cultivation area of some crops, unit area yields increased. Despite the decreases in wheat and barley production, continuous yield increases in the long run increased total production. This trend, which gradually closes the yield gap, should continue in the direction of approaching the countries with high yields without compromising food safety. Production costs need to be reduced not only by increasing productivity per hectare but also by using production resources more effectively.

Despite the decrease observed in the cultivated land areas, the areas where fruit production is made increased (TURKSTAT, 2020a). Turkey must shift fruit orchards to the sloping lands so that field crops could be produced on the base lands where two or three harvests are made annually. Turkey is a major exporter of fruits and vegetables. In addition to hazelnuts, citrus fruits, raisins, apricots and figs, cherry and tomato are among the important export products. Good agricultural practices and organic agriculture should be made widespread for these export products and thus a good image could be attached to Turkey's export products. In this way, Turkey's share of international market could increase by making use of the opportunity that occurs from increasing awareness of food safety because of the COVID-19 pandemic.

The greenhouse cultivation area, which has intensive input use, has increased by 40 % in the last 15 years. The increase in income and the rapid change in out-of-season consumption habit necessitate a faster increase in greenhouse production. The ornamental plants sector, which has a relatively small share but great potential in terms of trade volume and is quite young and dynamic compared to competing countries, has grown 2.5 times in the last fifteen years (TURKSTAT, 2020a). Despite this increase, the foreign trade deficit continues in the ornamental plants sector. The allocation of unused quality treasury lands to the producers of ornamental plants through long-term leases will make significant contributions to the sector. Since the products whose product value chain, especially greenhouse and ornamental plants, are complex and sensitive, are most affected in the COVID-19 pandemic, it is necessary to closely follow and strengthen the market supply chain of these products for sustainability and self-sufficiency.

### *Animal Production*

Turkey's share of animal products in the production value of agricultural production value in 1995 was 18 % rose to 25 % in 2003, to 34 % in 2017 (TURKSTAT, 2020). While this rate is 43 % in European average, it is 50 % in Northern European countries (EROSTAT, 2020). The continuous increase of this share shows that the trend is in the right direction. It is observed that animal numbers increased by 66 % in bovine and 81 % in ovine in the last 10 years, and the number of animals increased to 17.8 and 48.5 million, respectively (T.R. Agriculture and Forestry Ministry, 2020a). It is essential that the significant increase in yields observed in meat and milk production continues with good care and feeding conditions as well as versatile breeding and selection. The fact that animal husbandry supports, which have increased from 5 % to 30 % in the last 15 years, increased by 40 % in 2020 indicates that these positive developments in animal husbandry will continue (T.R. Presidency, 2020). Ovine breeding can be done more profitably with a good herd management by increasing the twin birth rate and reducing costs.

Chicken meat and eggs, which are mass-produced by concentrating in certain regions, both take very important part in the nutrition of the society and bring foreign currency to the country through foreign sales (T.R. Agriculture and Forestry Ministry, 2020b). Turkey has the largest companies in the poultry industry. It is stated that there are 1.5 million people working in many fields such as pharmaceuticals, vaccines, sub-industry, transportation, marketing, as well as farmers, tradesmen, raw materials producers who make a living from this sector. Corn and soybean which is the main material of the feed constituting 68 % of the production cost of the poultry sector as well as breeding material are imported significantly. The continuation of the developing momentum of the poultry sector depends on its success in reducing the dependence on imports of input.

Turkey carries out the production of 650 thousand tons of aquatic products, including hunting by half and the cultivation by other half with an important of navy and hence fisheries. Approximately one third of its aquaculture production is obtained from inland waters and the rest from seas. More than 90 % of the production made by hunting was from the seas, the rest from inland waters. The total foreign trade amount of the sea products exceeded 1.1 billion dollars in 2017, yielded a trade surplus and provided foreign currency. The per capita consumption of fishery products is around 6 kilograms. This figure is under the world and European average. Although this low level of consumption, the increase in fish prices in recent years could not be prevented (T.C. Agriculture and Forestry Ministry, 2020b). Among other efforts to increase domestic consumption of seafood, value added tax should be reduced to 1 % in wholesale and 8 % in retail. This fragile structure of the fisheries sector, which is one of the sectors most affected by the Cov-19 pandemic, should be improved.

Turkey is the world's second largest honey producer where honey production increase of about 50 % in the last fifteen years. However, it ranks low in terms of productivity per colony (hive) (T.R. Agriculture and Forestry Ministry, 2020b). It is necessary to increase the production of other beekeeping products such as pollen, royal jelly, propolis, which provide a significant amount of additional income and to market them at sufficient value. It is also important for beekeeping sector to produce queen bees suitable for the conditions of different regions, to expand organic honey production and to continue current supports with increased amount. Also working with high yield, strong and healthy colonies; keeping the colonies in rich pastures where natural conditions are suitable; use of modern equipment and providing sufficient knowledge and experience for the beekeepers will improve beekeeping sector in Turkey (Yavuz et al., 2016).

#### *Food and Drink Manufacturing*

The agricultural products produced on the farm reach the consumers with a marketing chain that goes from “field to fork” with its commonly used expression. Each of the transport, storage, processing and exchange activities in this chain creates added value by generating benefits (Kohls & Uhl, 1990). The food and beverage manufacturing industry, which performs one or more marketing functions, primarily by changing the shape by processing agricultural products, plays an important role in the industrialization of the country besides its social and economic well-being. Turkey, located in the world's first twenty economies, is the world's 15th exporter in the food and beverage industry (Keleş, 2013).

The main problem of the food and beverage industry related to the agricultural sector is the inability to supply the desired quality and quantity of raw materials to the industry in a sustainable way. According to the assessments, the ratio agricultural products processed in developed countries is 70 % while it is an average of 30 % in Turkey. Therefore, it is important to expand the integration of the agriculture and food industry, to increase the quality of raw material production, to include diversifying activities, to increase the efficiency of small manufacturing enterprises, to make technological renewal in all branches of the food industry, to establish and implement quality management systems effectively.

The future technologies, called “Industry 4.0”, which have undergone a great change in the food and beverage manufacturing industry through digitalization, should also be on the agenda of the food and beverage industry. This digital change is expected to increase in all stages of the food value chain after the COVID-19 pandemic. Rapid dissemination of content and product labels such as halal food, good agriculture, organic farming, geographical indication will also increase due to food safety sensitivity during the pandemic.

## **Agricultural, Rural Development and Natural Resources Policies**

Although agricultural policy objectives vary between countries due to different agricultural problems, the three main objectives are similar in all countries of the world. These; To ensure the nutritional needs of the society, to increase the income level of those who work with low earnings in the agriculture sector and to ensure that family businesses, which make up a large part of the agriculture sector, can make sustainable agriculture (Yavuz, 2017c). The main purpose of rural development policies is to improve the work and living conditions in the countryside.

### *Rural Population, Structure and Development*

Rural population growth, mechanization, the inability to create non-agricultural employment, and factors such as increased ease of transportation has brought migration from villages to cities throughout Turkey. Due to the fact that the yield gap in agricultural production could not be closed yet, sustainable sufficient income cannot be obtained and the work and living conditions in the rural areas are not at the desired level, and thus the young people move away from agriculture and rural areas. As a result, it is seen that middle age in agriculture, that is, in the rural areas, is quite high compared to the cities. While the average age is 31 in Turkey, the median is 52 in agriculture (Donat, 2018). It is not possible to revive economic activities and improve working and living conditions where people are not young. Therefore, it is necessary to make more emphasis on rural development policies that will prepare the ground for return to the village and to make investments in the food and beverage manufacturing sector, which will provide employment in rural areas to the population drawn from agriculture.

The fragmentation of the lands through inheritance or sales has greatly adversely affected agricultural production efficiency. The average farm size in Turkey has dropped to 5.9 hectares. This size is 53.8 hectares in the UK, 52.1 hectares in France, 45.7 hectares in Germany (Aksöz, 2014). The Law No. 6537 on the Amendment of the Land Protection and Land Use Law was published and put into effect to prevent the division of the lands by inheritance (Official Gazette, 2014). Acceleration of land consolidation works for fragmented and scattered lands with similar purposes with this law has also been an appropriate practice. While the consolidation works are carried out for 450 thousand hectares between 1961-2002, the area whose planning works have been completed from 2003 to 2014 is 4 million 532 thousand 785 hectares with the ones continuing their applications.

Programs, projects, investments, and supports are being continued to improve working and living conditions respectively in agricultural activities and rural areas. Rural development projects are being carried out with the LEADER program, especially the EU IPARD program, the Agriculture and Forestry Ministry's Young Farmer support, grants by regional development agencies and other rural development supports. In a rural area where social, economic, cultural and organizational living conditions are not improved and young



people are not attracted, there will be no future of the agricultural sector. Rural development programs that contribute to the creation of improved working and living conditions that will attract young people should have the characteristics of mobilizing local initiatives, developing a project work habit, evaluating local potentials and learning from each other by making good practice examples visible.

#### *Agricultural Inputs and Supports*

The most important inputs that increase productivity in crop and animal production are diesel oil, chemical fertilizer, seed, feed, agricultural credit, and irrigation. The main objective of the input policies is to remove the restrictions on the availability of the quantity, quality and conditions needed in these inputs. The optimum use of chemical inputs is of particular importance for food safety, which is becoming increasingly important. Diesel, which is one of the most important inputs and cost items of agricultural production activity, has become more important with the increase of mechanization in agriculture. While the seed was considered as the main source of only plant production in the past, today it is also considered as the basis of plant health and food safety. Supports given for water use and irrigation investments are important for the desired use of irrigation water, which is a very important input. Along with the supports given to fertilizers, medicines and seeds, the increasingly strong oligopoly structure should be prevented and dependence on import should be reduced.

The agricultural supports given to guide the agricultural sector in the desired direction are government interventions that are put into practice and terminated when there is a need and no need respectively to solve the problems arising in the sector, to adopt new technologies and to eliminate production deficiencies. The main goal is to create a sector that is competitive and not dependent on supports, that is, which can stand on its own feet (Official Gazette, 2019). Therefore, agricultural supports are expected to both positively affect farmer income and contribute to the solution of the sector's problems. However, the shock caused by the COVID-19 pandemic highlighted self-sufficiency as in countries around the world, as well as competitive agriculture. Therefore, agricultural supports will be shaped in this direction after the pandemic.

Agricultural supports have increased continuously in the last sixteen years, from about 1.8 billion TL to 14.5 billion TL, and livestock supports within these supports have increased from 83 million TL to about 4 billion TL. When the real value of the supports, which appear to have increased by eight times its nominal value, has increased 2.1 times in real Euro and 2.6 times in real TL in the last sixteen years (Yavuz and Dilek, 2019). In 2020, the supports increased by 30 % compared to the previous year and reached 22 billion TL (Official Gazette, 2019b). Agricultural supports; It can be grouped under six headings as area-based, difference payments, livestock, rural development, agricultural insurance and other agricultural and compensatory supports. The ratio of area-based and difference payment supports that make up plant production



supports has decreased from 93 % to 50 % in total in the last 16 years. The most important factor in this decline is direct income supports, which increased to 85 % of all supports in the early 2000s. Livestock supports increased steadily in 2002, at 5 %, and have remained close to 30 % in the past 6 years. Rural development supports started in 2008 reached 10 %, agricultural insurance supports started in 2007 reached 7 % and the share of other agricultural supports reached 7 % (T.R. Agriculture and Forestry Ministry, 2020c).

In order for the supports to direct the farmers in the desired direction; they should be long-term, consumption support should be added to production-based supports when necessary, regional differences should be taken into consideration more, income risk insurance should be developed in addition to production risk insurance, and producers producing for the market should be considered primarily in terms of increasing the production value. Correct planning of supports, increasing the efforts and effects of the staff and technical personnel carrying the supports to the field in line with the targets, providing all information about the supports to the farmers and easy procedures of getting support are required for more effective support policies. It is important to encourage young and self-employed farmers to stay in the countryside and to carry out agricultural activities in order to achieve the purpose of the supports. For this, it is necessary to make the rural working and living conditions more competitive with the cities. The tendency to return to the rural area observed by the COVID-19 pandemic should be used for this purpose.

It is inevitable that farmers, producers, growers take part in the trade of what they produce by taking risks and cooperating. In order for farmers to participate successfully in commercial activities, it is imperative that cooperatives and producer unions of which they are members are functional and professional. There is a need for policy actions that will make producers' associations and cooperatives effective in order to reduce the price difference received by the producer and the price paid by the consumer. While consumer sales rate of 90 % in the case of producers' associations in developed countries, it is only 6 thousand in Turkey (T.R. Commerce Ministry, 2018). Policies that produce solutions should be developed by making good use of the digital technology to solve food supply chain problems caused by the COVID-19 pandemic in order to reach the farmer more of the price paid for food, especially fresh fruits and vegetables.

#### *International Agricultural Trade*

In countries like Turkey where agriculture is an important part of the economy, a significant increase in the supply of agricultural products occurs over time. As this increase will be higher than the increase in domestic demand, agricultural exports must be engaged in order to prevent the price drops that may occur and thus farmers to obtain sufficient income. Turkey's agricultural exports increased by about 4.4 times last fifteen years, nearly 20 billion dollars, while imports exceeded 15 billion dollars in the same period increased by

5.4 times (T.R. Agriculture and Forestry Ministry, 2020b). In international trade of agricultural products, Turkey should give priority to high value-added products, create image and brand by expanding good and organic farming practices in traditional export products, increase international market diversity and size, raise the quality standards in export products, should establish the international market infrastructure well and ensure its continuity. After COVID-19 pandemic, in order to prevent possible decline in domestic agricultural product prices in the future, Turkey should increase the existing export potential. For this; Turkey should use its advantage of being close to the countries depending heavily on imports of food consumption. Moreover, Turkey should help small island countries where food consumption totally based on imports to eliminate the difficulties they encounter in reaching food after the pandemic.

The main purpose in relations with the European Union should be not to become a member, but to make the best use of the opportunities and resources provided by the membership process. In this sense, in order to comply with the Common Agricultural Policy, it is necessary to focus on rural development policies in particular, thus making the most of IPARD rural development supports. By updating the Customs Union agreement, the range of Customs Union products will expand to cover agriculture, services, industry, and public procurement. It is also aimed at preventing the victimization of Turkey will sign the Free Trade Area of the European Union with third countries. Turkey should carry out well the negotiation process with the EU because it is the most important market in the trade of agricultural products. For this; to make maximum use of opportunities for the continuation of the process; updating existing policy tools; to develop new policies and to grow, develop and strengthen trade relations by increasing the competitiveness by making maximum use of derogation and special product privileges if necessary. In this sense, opportunities occurred after the COVID-19 pandemic should utilized for the benefit of Turkey in governing relations with EU.

Turkey that takes place in the group of developing countries according to the classification of World Trade Organization (WTO), can benefit from the privileges accorded to this group. In addition, developed countries reduce their export subsidies, customs duties and their agricultural support. As a result of all these reductions, Turkey is able to achieve some gains in terms of competitiveness of agricultural products in foreign markets. In domestic supports, there is no problem in possible liabilities if the input and price supports and premiums are less than 10 % of the total support budget. As the alternative product supports applied in hazelnut and tobacco under the blue box measures will not exceed 5 % of the total agricultural production value, there is no obligation to affect these supports negatively. It is understood that supports such as direct income, rural development, food security, infrastructure investments and general services included in the green box measures could be implemented as they are today. It is inevitable for Turkey to establish a competitive agriculture because of WTO's trade mission of a competitive free

trade. However, the self-sufficiency tendency of countries formed with the COVID-19 pandemic may require different approaches.

#### *Food safety and Consumption*

Consumer preferences, governmental incentives and producer which are the three main immersive drivers that lead to the development of alternative agriculture, called good, natural and organic initiatives should be supported (Yavuz, 2017d). In addition to supporting large-scale commercial alternative agriculture, it should expand the facility of hobby gardens in areas where there is no agricultural production in cities, facilitate vegetable production in the gardens of houses and apartments, if any, and small farmer markets, especially based on local products, associated with rural development and contacting the consumer directly. For quality, healthy and safe consumption, plant and animal health control should be done very well, food inspections should be carried out on time and on site, basic food consumption should be supported, food information pollution should be eliminated, halal food, food content and shelf life practices should be implemented, environmental awareness in the food value chain must be aimed. The tendency to reach more reliable food after COVID-19 will serve these purposes.

#### *Natural Resources, Environment and Agricultural Forestry*

Soil, water and air, which are the main components of natural resources, are the main resources used in agriculture and their careful use is essential for sustainability. Agricultural land, forest and pasture are part of the whole ecosystem and interact with each other. One of the important issues for the sustainability of this ecosystem is the misuse of forests and the other is to waste the production resources available in and around the forest in order to protect forest areas. Agricultural forestry, which is an increasing trend in the world in this context; It is a form of land use that provides combined land use and increases the productivity of the land by combining forestry, crop production and animal husbandry on the same land at the same time or in succession (Turna, 2013). Agricultural forestry with its multi functionality is also a part of the solution of environmental, economic, and social problems on the agenda. Agroforestry, which is compatible with sustainable resource use, development, agriculture, and food security policies, can be predicted to come to the fore more after COVID-19 pandemic.

A policy or practice that concerns the agricultural sector will affect the environment, as well as environmental decisions can be influenced directly (Yavuz, 2015). Agricultural activity may have negative environmental impacts on water and soil resources, biodiversity, and climate. In order to mitigate these effects, organic farming law and regulations, good farming practices, genetically modified organisms (GMO) and agricultural law, including the support for biological security and environmental protection (ÇATAK), are policies aimed at reducing these effects. In addition to improving these policies, it is to realize sustainable production, consumption, and development, which is the main purpose of environmental policies, by introducing new ones based

on the need. Instead of being at the extreme in environmental policies, there is a need for policies that find the middle way, and therefore, it is necessary to act in this direction as sustainability comes to the fore in environmental policy as in every field.

### **Foresights During and After Pandemic**

As mentioned in the history of pandemics, the pandemic COVID-19 has caused many significant changes in all areas of life throughout the world as well as in Turkey and will continue to do so in the future. After December 2019 around the world and after March 2019 in Turkey in all sectors from agriculture to health, we will be observing the impact of the extraordinary developments taking place in every field from education to working life in the coming years. Just as we were making comparisons by saying before and after the 1929 Great Depression, it seems that we will make evaluations in every field before and after COVID-19, especially in academic studies. Implications for the possible future effects of the pandemic have quickly taken place and will take place in the institutions' web pages, scientific articles, magazines, press and social media. Here, global developments during the pandemic, the situation in Turkey, measures and projections for future will be discussed in the context of agriculture.

### ***Global Developments and Expectations***

Both life and livelihoods are at risk due to the COVID-19 pandemic. Although in some countries, the spread of the pandemic has slowed, and cases have decreased; in others it continues to spread again or rapidly. It is known that the global pandemic will eventually withdraw, but there is uncertainty how fast this will happen. It is also observed that this shock is a bit unusual as it affects both food supply and demand. Unless rapid action is taken to protect the most vulnerable people, keep global food supply chains alive, and mitigate the effects of the pandemic on the food system, there will be an increasing risk of food crisis (FAO, 2020a). Closure of borders, quarantines and market, supply chain and trade disruptions restrict people's access to adequate/diverse and nutritious food sources, especially in countries that have been hit hard by the virus or are already affected by high levels of food insecurity.

In fact, there is enough food production globally to nurture everyone. All policy makers in the world should be careful not to repeat the mistakes made during the 2007-2008 food crisis and turn this health crisis into a completely preventable one. Due to the increase in unemployment rates and the greater economic effects of COVID-19; the significant slowdown of all economies in the world, and especially the weakest economies, forces countries that depend on food imports, especially in food supply. On the other hand, prices will fall in 2020 as food demand will decrease in the coming months, which will have a negative impact on farmers and the agricultural sector. Since the supply of food was sufficient and the markets were stable during the pandemic, the

cuts were reduced to a minimum despite difficulty in the supply of high-value goods such as fruits and vegetables.

As of May 2020, problems are still expected in food supply chains, especially in high-value products such as fruits, vegetables, meat, fish, milk (The Guardian, 2020b). Movement constraints and the basic avoidance behavior of workers can slow down the activities of farmers, agricultural workers and those who process agricultural products. Lack of fertilizers, veterinary medicines and other inputs can affect agricultural production. Closure of restaurants and less frequent daily needs exchange will affect manufacturers and suppliers by reducing demand for fresh produce and fishery products. The agriculture and aquaculture sectors are particularly affected by the break of tourism, the closure of restaurants, and the suspension of cafes and school meals. In all cases, the most affected are immigrants, displaced and those who are exposed to conflicts.

Around 820 million people in the world live in starvation, meaning they consume insufficient amounts of calories for a long period of time for a normal active life. According to an analysis by the United Nations Food and Agriculture Organization (FAO) on April 24, 2020, in the absence of timely and effective policies, millions of people are likely to join the ranks of hunger as a result of the stagnation triggered by COVID-19 (FAO, 2020a). This number may increase from 14.4 million to 38.2 million, or even 80.3 million, in the case of an average 10-point contraction in the GDPs of 101 countries that are net food importers in the world. According to the 2020 Global Food Crises report published in April, at the end of 2019, 135 million people in 55 countries and regions were estimated to experience acute food insecurity in situations such as the COVID-19 pandemic (FAO, 2020b). 73 million out of 135 million faced with this crisis are in Africa; 43 million live in the Middle East and Asia and 18.5 million live in Latin America and the Caribbean.

In addition, as of the end of 2019, it is likely that 183 million people in these 55 countries and regions are not at the crisis level yet, but are at risk of falling into crisis levels if they are exposed to acute food insecurity and face COVID-19 shock or stress. In addition to food security, small countries dependent on exports and tourism too much in terms of income will experience significant problems due to the pandemic (UNCTAD, 2020). These countries, which are heavily dependent on the export of primary goods such as food, raw materials, and fuel, will be affected by a significant decrease in demand from developed countries. If the countries in Africa cannot export their products such as oil and cotton, their income will continue to decrease. In addition, there are much more significant problems for small islands and regions, most of which are dependent on oil exports and tourism income. Because the main sources of income which is tourism is shut down and will probably continue like this or slow down significantly until a vaccine or treatment is provided.

Vulnerable groups include small-scale farmers, immigrant and informal workers, immigrants and fishermen who are prevented from working on their land, looking after farm animals or fishing. In addition, these segments will have difficulties accessing markets with higher food prices due to selling their products, purchasing basic inputs or limited purchasing power. Informal workers will be greatly affected by job and income losses during harvesting and processing. Millions of children are already missing school meals they obtain safely, and many do not have official access to social protection, including health insurance. Suspending school meal programs due to the pandemic puts vulnerable children's food safety and nutrition at risk, while weakening their capacity to cope with diseases. Livelihoods, food security, nutrition and trade will be negatively affected in countries based on the fisheries sector, which provides more than 20 % of the protein need of 3 billion people in the world and 50 % in some underdeveloped countries and produces the most traded food in the world.

It is a complex network that covers food supply chain producers, consumers, agriculture and fisheries inputs, processing and storage, transportation and marketing. The cuts are minimal, as the food supply is sufficient during the pandemic and the markets are stable so far. Global grain stocks are at a comfortable level, and for 2020, the outlook for wheat and other essential crops is positive. High value goods such as fruits, vegetables and fish may have difficulties that are not yet fully observed due to the locking and deterioration in the value chain. Significant market changes may occur in the fisheries and aquaculture and fishing sector, which affect prices due to restrictions in transportation, border closures, tourism developments and demand for restaurants and hotels.

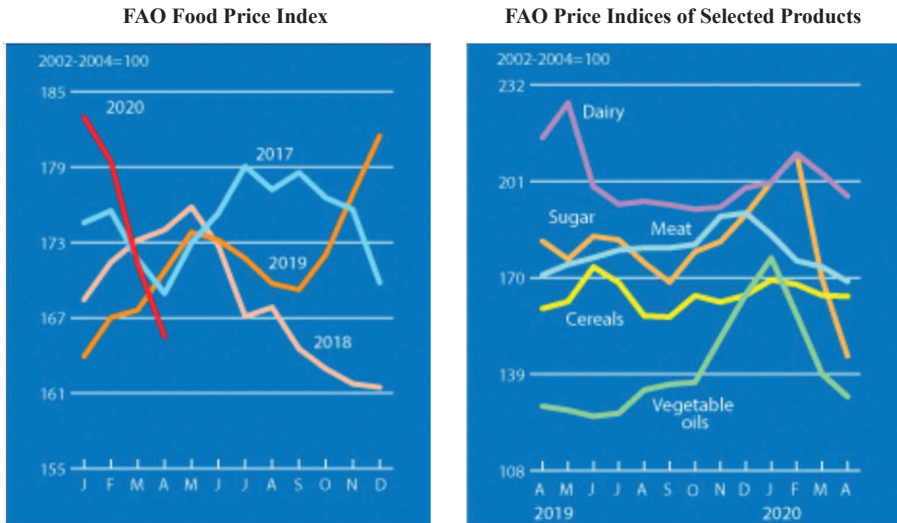
Although there has been a significant increase in demand at the beginning of the COVID-19 pandemic, food demand is generally not flexible, and although dietary patterns change, the effect of the pandemic on overall consumption will likely be limited. There is a relatively greater possibility of a reduction in animal protein consumption, with the concern that the virus is infected by animals. Sudden drops may also be seen in consumption of other high-value products such as fish, fruits and vegetables. Food demand in poor countries is more linked to income, and loss of income-generating opportunities can adversely affect consumption. Fear of contagion can lead to a decrease in visits to food markets, and it seems that there has been and will continue to be lower restaurant traffic, increased e-commerce deliveries, and home food growth changes in the way people buy and consume food.

Since the beginning of May 2020, international prices of some important food products such as corn, wheat and palm oil started to decrease. The only main food that sees rising prices is rice, and this rise was due to the export restrictions of Vietnam, which is an important exporter, on May 1<sup>st</sup> 2020. In local markets, especially in countries already affected by hunger and other crises, some food prices are rising mainly due to local logistics problems or

import difficulties. As food demand will decrease in the coming months due to the economic contraction, prices will probably continue to drop in 2020 and this will have a negative impact on agriculture and thus on farmers. According to the price indices calculated by FAO (FAO, 2020c), in the first four months of 2020, which is the pandemic process, prices have fallen sharply compared to previous years and on a product basis (Figure 1).

International commodity trade will decrease by 13 % to 32 % in 2020 due to the COVID-19 pandemic (WTO, 2020). This decline is likely to exceed the trade decline caused by the 2008-2009 global financial crisis. Trade is likely to fall sharper in sectors characterized by complex value chain links, especially in electronics and automotive products. Service trade will also be highly affected by the implementation of transportation and travel restrictions and the closure of many retail and hospitality businesses.

**Figure 1.** FAO Food Price Indices by Year and Product



On the positive side, it is stated that a quick and strong recovery is possible, provided that policy makers show a reason for businesses and households to believe that the pandemic is a temporary, one-time shock. To achieve this, they must format all their financial, monetary and trade policies in the same direction. As a return to protectionism will bring new shocks over the existing ones, it will be critical to promote a more generally favorable business environment, as well as keeping markets open and predictable.

### Turkey’s Situation and Assessments

The three major changes caused by the COVID-19 Pandemic, which started to appear in December 2019, in all societies; decreased or stopped mobility, new uncertainty/instability, and new patterns of behavior with health



reservations. These very important changes in the flow of life have affected the supply-demand balance and price formation in a shocking manner and will continue to affect. Generally, it is predicted that it will reduce production and consumption, that is, demand and supply, and thus will have an impact that will reduce global economic growth from 2.9 % to 2.4 % and 1.5 % in case of the pandemic lasts long (IMF, 2020). It is estimated that tourism services, which have completely stopped with the pandemic, will not recover any time soon. The last one month (April 15 - May 15, 2020) in Turkey consumption among the different expenditure items with credit card declined by 5 % to 93% and by 37 % on average and this decline is expected to continue during the pandemic (TEPAV, 2020). The uncertainty that emerged during the pandemic led to an incline of people to liquidity tools such as gold and dollar instead of spending and consequently a contraction in demand. On the one hand, the liquidity instruments gaining more than 20 %, and the declines in the product price indices on the other, are important indicators of this behavior result. These decreases in supply and demand for goods and services have caused and will continue to be the cause of income decline, unemployment and growth of income imbalance.

These effects of COVID-19 pandemic on the economy have been also experienced in agriculture and food sector, which is an important branch of the economy, and these effects are expected to continue. However, due to the unique characteristics of agricultural production and products, these effects will be different from the other sectors. As due to the necessity to carry out agricultural production activities in a certain period of time without delay, the length of the vegetative and animal production period, the fact that food products are mandatory goods and quick satisfaction in consumption of these products, the elasticity of the supply and the demand of agricultural products is low. Therefore, it is estimated that the contraction in agricultural production and food consumption will be much less than other sectors, but fluctuations in food prices will be higher due to the COVID-19 pandemic.

Developments in the field of agricultural production and in the market food consumption due to the pandemic support these inferences. Farmers and agricultural workers have been exempted from curfew and quarantine practices, as agricultural activities have to be done on time. The global decline of 5 % in real GDP due to the COVID-19 pandemic will result in lower food demand (IFPRI, 2020). During the time of pandemic cases first observed in Turkey on March 13, 2020 as compared to May 1, 2020, on one hand there has been an only 15 % decrease in food consumption because food is essential consumption goods for life; on the other hand, a decrease of 65 % in clothing and accessories and a decrease of 47 % in gasoline and fuel according to the expenditures made by credit cards. However, while food consumption in the tourism sector has completely stopped, eating out costs decreased by 83% (TEPAV, 2020). With the first panic of the pandemic, only 6 % of decrease occurred in food consumption in the first week of April, increased to 15 % of decrease on May 1, 2020. In other words, although it is less than other sectors, there will be an important decrease in food demand.



In mid-April 2020, covering all regions in 30 provinces of Turkey, online interviews made with farmers, agricultural engineers and veterinarians (Yavuz, 2020a) and the information obtained from a survey study (Gündüz et al., 2020) showed that winter and summer plantings were completed without problems and there will be no problems in agricultural production activities in the next production period. However, it has been determined that there may be problems such as defects in the marketing chain of fresh vegetables and fruit produced under greenhouse, increasing costs in fertilizer and feed inputs due to the rapid increase in dollar exchange rate and shrinkage in small producer markets.

In addition, it is stated that the possible problems that may occur in the export of fresh fruits and vegetables subject to export cause uneasiness. It was also stated that there will be difficulties in the provision of foreign workers employed in agricultural activities and there may be problems in the harvesting and marketing stages of agricultural products. Decline in diesel price affecting agricultural production positively, increased food stocks not hindering food supply due to the pandemic before Ramadan in May 2020, some agricultural export items being revived due to new opportunities in the international market due to COVID-19, and cultivation area increase and high yield outlook are expressed as positive developments in food supply.

Panic caused by the first quarantine practices caused an increase in food prices. However, considering the developments in the production and consumption of agricultural products detailed above, due to the COVID-19 pandemic, it is foreseen that the decrease in demand will be higher than the decrease in supply, and therefore the prices of agricultural products, especially high-value crops, will decrease with the start of the harvest season after Ramadan.

For example, in the last month (April 2020), corn, soybean and wheat prices in the USA decreased by an average of 7 %. Similar price declines trends are also observed in Turkey. According to TURKSTAT data, while annual inflation rate in April 2020 was 11.27, an average increase of 8.58 % occurred in food prices and -20.98 % annual change in fruits and vegetables prices; monthly inflation was 1.11 %, an average increase of 0.55 % occurred in producer prices and -2.77 monthly change in fresh fruits and vegetables prices (TURKSTAT, 2020). If the pandemic is taken under control in a short time in Turkey and the purpose of the slogan “it can be entered safely” in tourism can be achieved in addition to the measures taken for agricultural production, the demand may return to its normal course even if it is not in the near future. In addition, if the foreign trade surplus of agricultural products continued to increase, the fall in agricultural product prices could be prevented.

## **Global and National Precautions and Policies**

During pandemic periods, fiscal policy plays a key role in saving lives and protecting people. Governments have to do whatever it takes. So far, countries have taken approximately \$ 8 trillion in financial measures to control the pandemic and damage to the economy, that is, saving lives, protecting people from business and income losses and companies from bankruptcy.

The global emergency measures include \$ 3.3 trillion higher spending and abandoned revenues, public sector loans, \$ 1.8 trillion injections and \$ 2.7 trillion guarantees (IMF, 2020). Twenty developed and developing country groups stand out with a total of 7 trillion-dollar business. Financial support is also provided by automatic balancers, which are features of the tax and benefit system that balances income and consumption, such as progressive taxation and unemployment benefits.

FAO warned governments that protective measures taken at the national level during the COVID-19 crisis could cause food shortages worldwide (The Guardian, 2020a). The outlook to produce essential products is promising. However, there may be problems such as the shortage of field workers brought by the pandemic crisis and a movement towards protectionism such as tariffs and export bans. The worst thing that can happen is that governments restrict the flow of food, and all measures taken against free trade will be inefficient. The pandemic is not the time to put restrictions or trade barriers, but it is time to protect the food flow in the world. Governments have to resist calls from some neighborhoods to protect their food supply by restricting exports.

Kazakhstan, which has the largest agricultural resources in the world, has put restrictions on the export of wheat flour, as well as brown wheat and vegetables such as onions, carrots, and potatoes. Vietnam, the world's third largest rice exporter, has suspended its rice export contracts. Russia, the world's largest wheat exporter, is likely to threaten to restrict exports as before. The US position is doubtful, considering Trump's willingness to trade war on other goods. Trade barriers will create excessive volatility and worsen the situation, which is often observed in food crises.

Care should be taken not to break the food value chain and logistics that need skilled collectors who work quickly with the right timing. Fruits and vegetables also require very labor-intensive production and logistics. If the workforce is blocked and people cannot move, there is an important problem. COVID-19 affects the workforce and logistics problems are becoming very important. Workforce should not be restricted while protecting people. Policies need to be created so that the workforce can continue to do its work. The most important role of governments will be to keep this food supply chain running, to intervene ensuring that there are enough workers and to protect global food markets from panicking and to develop storage facilities such as warehouse receipt system platforms where farmers can deliver their products without having to go to the markets. If possible, local markets should be kept open and tight physical measures should be taken inside and outside the markets.

Fiscal, monetary, and financial policies that are put into effect in Turkey, are similar to the government expenditures made in other countries around the world with approximately 8 trillion dollars of government spending with the Keynesian approach. As of mid-May 2020, approximately 5 million families were given cash assistance, and those who lost their jobs were also included in this aid, within the scope of the resume package, approximately 137 billion TL financing was provided to 190 thousand 453 companies, 97 % of which were Small Middle Enterprises. Within the scope of the support provided for citizens with a monthly income of less than 5 thousand TL, more than 33 billion TL of resources were offered to 5 million 582 thousand citizens. Financial support of more than 23 billion TL was provided to 1 million 16 thousand 600 tradesmen. The economic amount of the Economic Stability Shield, which has been put into practice in the fight against the COVID-19 pandemic, has reached 240 billion TL, which is around 5 % of the national income (T.R. Treasury and Finance Ministry, 2020). In addition to these financial spending policies, which mostly support income, transferring resources obtained through social solidarity to those in need will also contribute to the increase in demand for agricultural products (Yavuz, 2020). Practices that exempt farmers from the limited quarantine enacted (T.R. Interior Ministry, 2020), the seed support provided to increase summer planting and the supply of treasury land for planting will prevent the reduction or even increase agricultural production.

Policies aimed at eliminating the deficiencies occurring and will occur in the supply chain of the products whose value chain is complex and / or for export-oriented products, especially green vegetables and oranges, should be implemented dynamically with close follow-up. In order for this 2020 agricultural production period to be successful after the pandemic, providing the 2020 agricultural supports payments on time and even a little ahead is necessary and will affect future harvest years positively. In this budget congestion, the implementation of cost-reducing effective trade policies is essential in the supply of inputs dependent on imports, especially for feed ingredients and fertilizers and the products with production deficits due to the increase in the dollar exchange rate.

### **Policy Suggestions Converting Crisis to Opportunities**

The latest 11th Development Plan of 2019-2023 expresses the goal of creating an agricultural sector that is competitive and not dependent on supports (Official Gazette, 2019a). However, COVID-19 pandemic caused the countries to stand self-sufficiency in food production. This trend can be expected to put forward Turkey's self-sufficiency in the grounds next to competitiveness policy. If the agricultural product variety existed because of multi-climate is supported by advanced technology usage, Turkey will be easily providing its self-sufficiency, which is food security. Besides efforts to create large mass-producing businesses to ensure food security, small family farming which is very common in farm structure of Turkey within their optimal / economic farm

size with respect to its agricultural resources and that provides much better sustainability should also be given importance. It should not be overlooked that the efforts to produce fresh fruits and vegetables for self-consumption in small production areas to be established within the gardens of the houses or the hobby gardens established in non-agricultural lands, if possible, will also contribute to food security and even to food safety. It should also be noted that although self-sufficiency tendencies increased after the pandemic shock, it should not be forgotten that agricultural sector has to be still competitive when it returns to normal and sustainable agriculture is highly likely to stand out and thus long-term agricultural policies should be in this direction.

It is pointed out that the first outlet of COVID-19 in China is the markets where unusual wild animal meat is sold. In fact, it is also stated that food produced from such extraordinary animals has a role in previous virus pandemics. After the pandemic, the tendency to consume more reliable, halal, clean and natural foods will increase. This attitude will also trigger the emergence of a sustainable agriculture that protects natural resources and the environment. In addition, it can be predicted that the habit of eating at home during the pandemic will decrease the consumption of food outside and increase the consumption at home compared to the pre-pandemic. Therefore, successful steps could be taken by taking the trends mentioned into consideration better in food safety policies in production, transportation, processing, packaging, storage, distribution and sale stages in food chain from the fork to the field.

It may be envisaged to prefer rural life after the pandemic, especially those who have migrated from village to city for various reasons, and their attitude towards returning to the village will be strengthened and therefore migration from rural to urban will gradually reverse. Accelerating the return to the rural with policies that focus on improving working and living conditions in the countryside and developing rural tourism based on local products will both reduce the overpopulation of the city and prevent the rural ejaculation, leading to social, economic and cultural liveliness in the villages. This attitude change provides an important opportunity to successfully achieve the goal of “increasing the production capacity of rural producers and the employability of rural labor force with the understanding of sustainable rural development” expressed in the Eleventh Development Plan of 2019-2023 (Official Gazette, 2019a). It is vital to evaluate this possible trend, especially in the regions where rural areas and villages are emptied, and unowned and agricultural resources remain idle.

Prior to the pandemic, using digital tools within the reach of the world’s food agenda with online shopping and even to supply fresh fruits and vegetables has entered Turkey’s agenda. This agenda was formed by the food inflation experienced in off-season vegetables, primarily potatoes and onions, in 2019. The online purchases also came to the fore a lot due to the pandemic, took an important place, became widespread and formed a habit. In parallel, the software development work for the food supply chain in the world has

accelerated as well as in Turkey. Accordingly, the Ministry of Agriculture and Forestry brought the Digital Agriculture Market (DITAP) project, which will directly bring together the producer and the buyer. The project, which is planned to be piloted first in products such as oilseeds with a production gap and in fruits and vegetables with a high marketing margin, continues. Problems in the food value chain, especially the ones such as the farmer's inability to sell his product at the value price, not being in the trade of what he produces and the high price difference between the price received by farmers and the price paid by the consumer, could be eliminated by taking advantage of the opportunities provided by the trend of digitalization, which came to the fore with the pandemic. The New Wholesale Market Law, which has been on the agenda for a long time but has not yet been concluded, and the DITAP, which has entered the new agenda, can also be concluded by taking the advantages of these trends.

During the pandemic, as the government's efforts to increase agricultural production and planting area and yield increase information from the field, showing that contrary to the decrease in the supply of agricultural products will increase, decrease in demand for agricultural products due to the contraction in the economy, eating out, tourism coming to a halt and difficulties in accessing food will probably decrease the prices of agricultural products. Turkey, by increasing the export of agricultural products, can prevent this possible price decrease. It can be done by using the advantage of closeness to the countries with food consumption based on imports, and by eliminating the difficulties in accessing food caused by the epidemic of small and / or island countries that are completely dependent on imports. This increase in exports can make a significant contribution to the country's economy with its increasing foreign exchange supply and, if necessary, to the reputation of the country with food grants, such as healthcare supplies, which were provided as grants to many countries during the epidemic. In order to reach increasing export potential at this level, the problem of yield gap, which is an important structural problem of agriculture, should be solved primarily by accelerating the transfer of high technology to agriculture.

The emergence of the strategic importance of the agricultural sector with the COVID-19 pandemic has created a positive social awareness towards agriculture. By making use of this awareness and improving the conditions of work and living in the countryside, it is very important to ensure that those, especially young people, who are related to agriculture and rural, return to agriculture and villages. In addition, this awareness should be increased by an educational policy in the form of the plays in the kindergarten, the content of the lessons in elementary school, the courses in high school, and the productions in the media that involve in agriculture, farming and role model people working in agriculture. In addition, it is essential for the future of the agricultural sector to ensure food supply security and safety to attract post-high school young people's higher education preferences to agriculture, veterinary, aquaculture, food and forestry higher education with adequate incentives and

to place some of them in agricultural higher education from the top 0.1 % slice of the students who enter university exam.

Since agricultural sector which is very much dependent on natural conditions such as climate, market changes such as prices and shocks such as the pandemic experienced in 2020 needs to be governed by regulating, supporting and inspecting policies. In order to govern agriculture sector in a better way especially in the times of pandemic, it is necessary to trace and evaluate agriculture and food market very closely so that precautions such as regulation, support and inspection could be taken to solve the problems on time. It is necessary to collect all type of data of agriculture and food market, analyze them and asses the results of analyses to trace and evaluate the market of agriculture and food. This mission could successfully be borne by an autonomous intuition namely “Agriculture and Food Market Tracing and evaluating Intuition”. Foundation of an institution by this name and the function specified became very urgent especially after the COVID-19 pandemic.

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