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COVID-19

RAPID IMPACT ASSESSMENT ON THE AGRI-FOOD SECTOR AND RURAL AREAS IN TURKEY



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About the Study

The COVID-19 Socio-Economic Impact and Response Task Team (SEIRTT) in UN Turkey, co-led by UNDP and the Resident Coordinator's Office, was established at the request of the UN Country Team (UNCT) with a view to informing the readjustment and expansion of the portfolio of programs of the UN and its partners in Turkey, including 3RP, in response to the socio-economic dimensions of the COVID-19 crisis.

The International Fund for Agricultural Development (IFAD), the UN Development Programme (UNDP) and the Food and Agriculture Organization (FAO) decided to conduct a joint study with the Ministry of Agriculture and Forestry entitled "COVID-19 Rapid Impact Assessment on Agri-Food Sector and Rural Areas in Turkey" with an aim of contribution to the SEIRTT's Socio Economic Assessment and of helping set the basis for further institutional engagement with Government and other relevant partners and stakeholders in the short to medium term.

The study was conducted by a multidisciplinary team of national experts (one agricultural economist as team leader, one agricultural economist as value chain expert, one veterinarian as epidemiologist, and 1 zootechnical expert as physiologist) under the joint supervision of the representatives of the FAO, IFAD and UNDP through Agencies Committee. The multidisciplinary team which led the data collection, analysis and report writing was composed of:

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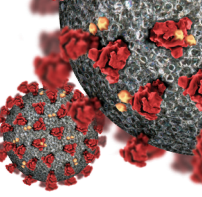
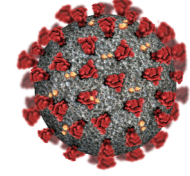
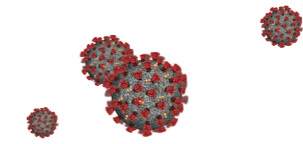
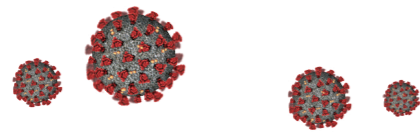
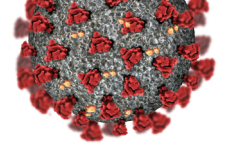
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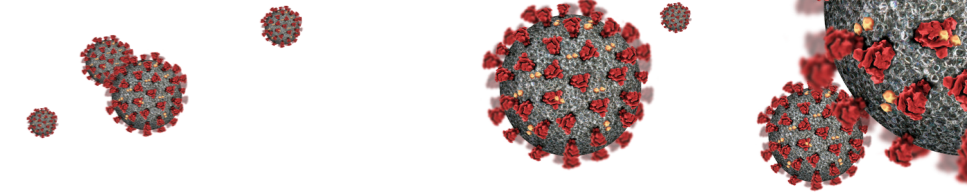
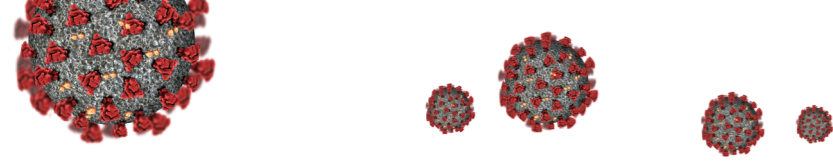
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List of Abbreviations

CFAP	Coronavirus Food Assistance Program
CGF (KGF)	Credit Guarantee Fund
COVID-19	Corona Virus Disease 2019
ÇKS	Farmer Registry System
DITAP	Digital Agriculture Marketplace Platform
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
HORECA	The Hotel, Restaurant and Catering sector
JAMA	Journal of the American Medical Association
JHU	John Hopkins University
MoAF	Ministry of Agriculture and Forestry of Turkey
MoH	Ministry of Health of Turkey
OIE	World Animal Health Organization
PPE	Personal Protective Equipment
ProMED-mail	A programme of the International Society for Infectious Diseases
RPSF	Rural Poor Stimulus Facility
SEIRT	Socio-Economic Impact and Response Task Team
SMEs	Small and Medium-sized Enterprises
TURKSTAT	Turkish Statistical Institute
TOBB	Turkish Union of Trade and Industry Chambers and Exchanges
UN	United Nations
UNCT	United Nations Country Team
UNDP	United Nations Development Programme
USA	United States of America
WB	World Bank
WHO	World Health Organization





Preface

The world is facing a global health crisis with the soaring number of infected people and deaths due to COVID-19, the pandemic is causing an unprecedented impact on myriad sectors in many countries. The measures adopted by the governments to contain the spread of the outbreak, including travel restrictions, partial or total lockdowns, quarantine measures and school closures, are having tremendous economic and social consequences, agricultural and food sectors are no exception. Necessary measures to contain the spread of the disease have translated into simultaneous demand and supply shocks to world economies.

Turkey has been implementing similar measures of movement restrictions, lockdowns as well as school and service industry closures to contain the Pandemic, calling for an urgent assessment of impact of the COVID-19 on the economy and society.

Therefore, the COVID-19 Socio-Economic Impact and Response Task Team (SEIRTT) has been established at the request of the UN Country Team (UNCT), co-lead by UNDP and Resident Coordinator's Office with an envisaged task of informing readjustment and expansion of portfolio of programs of the UN and partners in Turkey, including 3RP, in response to the socio-economic dimensions of the COVID-19 crisis. SEIRTT does an assessment of the economic and social impact of the COVID-19 crisis in Turkey, with the guiding references of 2030 Agenda for Sustainable Development and the principle of Leaving No One Behind in response to the socio-economic dimensions of the Covid-19 crisis with a medium-term perspective to contribute to the mitigation of the negative effects of the crisis on lives, livelihoods, society and the real economy.

The rural areas in which people live further apart than in cities and their livelihoods tend to be much more closely tied to the natural environment compared to urban dwellers has been also hit hard directly in terms of household income and indirectly through agricultural production. Considering relatively slow responsiveness of agricultural production because of its biophysical nature, governments make every effort to keep the gears of their agri-food supply chains moving in order to avoid food scarcity and shortages and to effectively combat the adverse effects of COVID-19. Any disruption over the agri-food chains hurt not only farmers, retailers and consumers but also seriously hit rural economies as a whole where 80 per cent of the world's poorest people live and Turkey's rural areas are not the exception. Put it differently, possible negative impacts of COVID-19 on agri-food chains could deepen the vulnerability of rural communities who are already prone to poverty. Thus, specific and timely policy interventions in agriculture plays a key role in mitigation and recovery responses for Covid-19. Studies show that economic growth in agriculture is two to three times more effective at reducing poverty than growth in any other sector.

Turkish Government has been also taking specific measures to relieve COVID-19 Pandemic related impacts on agri-food sector and rural areas. Examples of these measures are including but not limited to relaxation of movement restrictions for farmers, regulating worker movements including seasonal workers, arranging information campaigns on COVID-19 related hygiene and handling practices and consumption campaigns like `Evde Hayat, Tabakta Balik-Life at Home, Fish at Plate` to shift collapsed demand in exports and service sector to household consumption with the aim of alleviating negative impacts of the pandemic on food sector and supporting healthy diets.

A COVID-19 rapid impact assessment on the agri-food sector and in rural areas in Turkey. Therefore, UN Agencies, namely, the Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD) and the UN Development Programme (UNDP) aim at conducting this study jointly with the Ministry of Agriculture and Forestry. The study will guide the coordinated response provided in the rural sector under the leadership of the MoAF, and help identify policy recommendations to mitigate the impact of COVID-19 in the rural sector and accelerate recovery wherever needed.

1. INTRODUCTION

The COVID-19 pandemic is a global crisis. The number of people infected and dying due to the pandemic is rising, and the scale of the impact all over the world is unprecedented since the Spanish Flu of 1918. The measures adopted by governments to contain the spread of the pandemic have translated into simultaneous demand and supply shocks to world economies – and agriculture is not exempt from these shocks.

The pandemic has been ongoing since March 2020. According to WHO statistics, the number of global reported confirmed cases of COVID-19 has exceeded 114 million, including over 2.5 million deaths as of March 2021.

On March 11, 2020, the WHO declared a global pandemic. Scientists say the Index case (exact source) may never be identified: in other words, the questions of how, where and when the pathogen was first transmitted to a human could remain a mystery.

The supply and demand shocks caused by the measures taken to prevent the spread of the disease – such as quarantining, partial or total lockdowns, travel restrictions, the closure of schools and offices, virtual working, recommendations to stay at home and other social distancing rules – have affected many sectors of the world economy. These measures may also put food supply chains, food security and incomes at risk. From the beginning of the outbreak, countries have therefore taken emergency precautions in order to maintain food supply chains, sustain agricultural production and support vulnerable groups, paying particular attention to low-income families, small-scale businesses and small family farms.

Any disruption to agri-food chains not only hurts farmers, retailers and consumers but also seriously damages rural economies. Further, specific policy interventions in agriculture play a key role in mitigation and recovery responses to COVID-19. Studies demonstrate that economic growth in agriculture is two to three times more effective at reducing poverty than growth in any other sector.

Meanwhile, the COVID-19 pandemic has raised fears about food security and has highlighted the importance of agriculture. Since food is essential for survival, saves lives and livelihoods, and strengthens the immune system against the diseases, countries have made a special effort to protect the agriculture sector from any disruption. Turkey too has been taking specific measures to relieve the impacts of the COVID-19 pandemic on the agri-food sector and rural areas. These have included relaxing movement restrictions for farmers, regulating worker movements including those of seasonal workers, monitoring the situation of food enterprises and other parties engaged in food production and distribution, including retailers essential for ensuring food availability, and organizing information campaigns on COVID-19-related hygiene and handling practices as well as consumer-oriented campaigns.

1.1. Objective

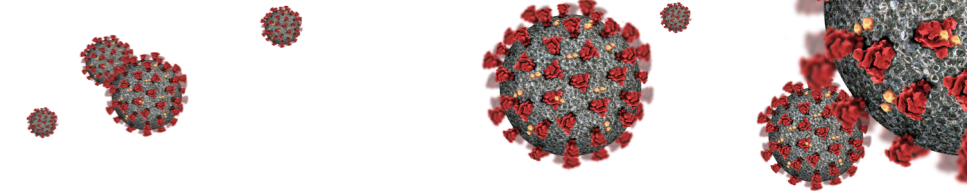
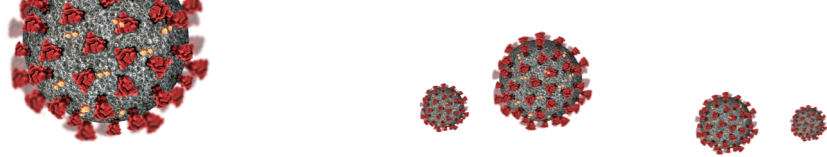
This report was prepared to analyze the agri-food sector and the resilience of rural communities, and to map the critical impacts of COVID-19, with a view to helping to identify and elaborate possible policy recommendations for mitigating these impacts. More specifically, the objective of this report is to:

1. Carry out a short term impact analysis of food systems in order to propose rapid mitigation actions in addition to the measures already implemented by the Government of Turkey;
2. Monitor the evolution of food security and the livelihoods of vulnerable households with a special focus on rural areas and particularly smallholder farmers, and
3. Identify recovery actions for the short and medium terms, including the policy response.

The Report has been prepared within the framework developed by the UN agencies – namely, the International Fund for Agricultural Development (IFAD), the Food and Agriculture Organization (FAO) and the UN Development Programme (UNDP). It is expected both to contribute to the Socio-Economic Assessment of the SEIRTT¹ and to help set the basis for further institutional engagement with Government and other relevant stakeholders in the short to medium term. It is also expected to guide the coordinated

¹ The COVID-19 Socio-Economic Impact and Response Task Team (SEIRTT), co-led by UNDP and the Resident Coordinator's Office, was established at the request of the UN Country Team (UNCT) with a view to informing the readjustment and expansion of the portfolio of programmes of the UN and its partners in Turkey, including 3RP, in response to the socio-economic dimensions of the COVID-19 crisis.





response implemented in the rural sector under the leadership of the Ministry of Agriculture and Forestry (MoAF), and to help identify policy recommendations to mitigate the impact of COVID-19 in the rural sector and accelerate recovery wherever needed.

1.2. Scope

The Report mainly encompasses the crop production, livestock, fisheries and food sectors, the sectors supplying inputs to these four sectors, and providers of services such as logistics and trade. The basic agricultural product groups focused on are grains and pulses, roots and tubers, fruits and vegetables, livestock (milk, cattle, small ruminants, poultry, eggs, apiculture) and fisheries. A certain parts of the food processing industry are also addressed. Within the agri-food supply chain, the main sources of information and data for the report were farmers, farmers' unions, suppliers of inputs (fertilizer, pesticide, insecticide, seeds, seedlings etc.), workers, processors, labor intermediaries, exporters, traders and technical staff. Alongside its focus on the economic, social and environmental impacts of COVID-19, the report addresses rural resilience with reference to poverty, gender, children, youth, temporary and seasonal workers and sustainability, analyzing and predicting the impacts of the pandemic.

The report describes the current situation in the world and in Turkey, including the responses of markets and policy-makers, using information gained through the literature review and assessment of secondary data. The main source of primary data is a survey conducted by the experts with farmers, other stakeholders and experts. A short-term impact analysis is also provided for food systems, mitigation policies and the policy implementation of the Government of Turkey. In addition, policy recommendations are made for the short, medium and long term pertaining to the agri-food sector and rural repercussions considering all its stakeholders.

In addition, the epidemiological implications of the pandemic are described with a view to understanding the impact of COVID-19 on livestock production and animal disease prevention and control. Another aim is to provide practical recommendations for actors along the value chains so as to reduce the impact of the pandemic and ensure the continuity of the livestock supply chain while taking animal health into consideration. The epidemiological aspects of the research are given in Annex 1 and mentioned in the relevant sections throughout the report.

This report is based upon a rapid assessment of the impact of COVID-19 Pandemic as of September 2020 and therefore did not include later developments.

1.3. Assessment Method

For the purpose of this assessment, the agri-food system refers to the entire range of producers, enterprises, institutions, consumers and activities involved in the production, processing, marketing and consumption of products originating from crop production, livestock, forestry and fisheries, including the inputs needed and outputs generated at each stage, as adapted from FAO (2013).

The main material of the study was collected through face-to-face interviews conducted by the researchers. Two different questionnaires were prepared: one for the farmers and the other for stakeholders. These were used in accordance with the aim of the study. In addition to the questionnaires, primary data was also obtained from focus group meetings, face-to-face interviews and phone calls with key informants, and personal observations.

Field work was carried out in the provinces of Ankara, Konya, Karaman, Mersin, Adana and Gaziantep in July, 2020. In addition, telephone interviews were conducted with key informants in other major agricultural provinces in order to reflect the situation in the whole country better. The findings were assessed using both qualitative and quantitative approaches for all the sub-sectors, stakeholders and regions that were covered in the study.

For the sections of the report concerning the current situation of the agri-food market and the policy responses of governments both in Turkey and in the world, the relevant information was gathered by reviewing the literature and conducting desk studies to assess secondary data such as the written and visual literature, field surveys, information and documents provided by relevant institutions and the experiences of countries and international institutions. These sections also draw on the resources of the relevant national institutions. All these secondary sources provided general information about the current



situation of the agri-food market and the sectors covered by the report.

2. SITUATION IN THE AGRI-FOOD SECTOR DURING THE COVID-19 PERIOD

COVID-19 has had a substantial impact on many sectors at the global, regional and national levels, including the agri-food sector. Measures taken in many countries, such as lockdowns, travel restrictions and border controls, have had unintended or negative effects on the agri-food sector, including but not limited to:

- difficulty in transporting crops, live animals, products of animal origin and aquaculture and fishery products to the markets,
- restricted transhumance, potentially limiting seasonal grazing for ruminants,
- restricted ability to purchase necessary inputs, and
- restricted access to labor and professional services.

The development of multi-sector information and communication channels becomes even more important in this pandemic period. The interconnectivity of humans, animals and the environment are important in understanding and tackling any threats to food systems, agricultural production and livelihoods. This is particularly important in rural livestock farming communities where animals play an important role for society and food security as they may be used to earn income as carriers and suppliers of heating material or clothing as well as sources of food. Because of the circulation of zoonotic agents between animals, humans and the environment, the cost of disease does not only affect human activity and health but also other sectors like livestock production, pet ownership, the food and textile industry, tourism, land use, foreign trade and, ultimately, GDP.

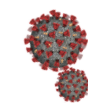
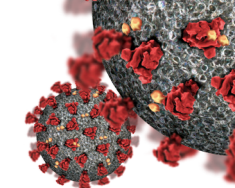
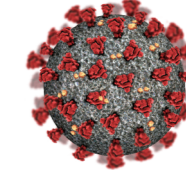
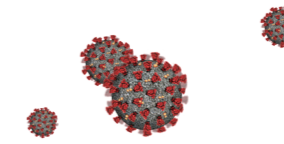
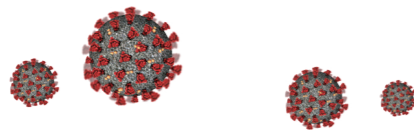
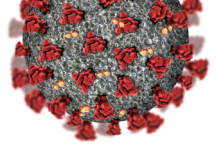
Many developing and middle-income countries are lacking in diagnostics, intervention channels and finance. Hence, interventions which are effective in industrialized countries cannot be transferred automatically to developing and middle-income countries. Effective interventions against zoonoses need to be contextually adapted to local socio-cultural and economic conditions and based on an in-depth knowledge of the local disease ecology, which is frequently different from that in industrialized countries.



Photo: Erkan Pehlivan, Özdal Köksal

There are several other ways in which zoonotic diseases might have economic impacts beyond the cost of control: costs directly affecting income at the household level from reduction in livestock sales; consumption impacts due to reduction in food and nutrition security; increasing household vulnerability to risks since livestock is often used as a risk-coping mechanism, and effects on household wealth which can affect savings (hence future livelihood outcomes) and gender equality (since women often own smaller livestock). In addition to household-level impacts, there are also impacts at the sector level, such as the feed and input sector, and at the economy-wide level which would include other input sectors and other output sectors which can be analyzed such as restaurants,

hotels and markets. These associated costs could influence behavioral change at various levels (households, practitioners, policy) with regards to the decision whether or not to control a zoonotic disease. Embracing this challenge, OIE, WHO and FAO recommend a One Health approach, in which the animal, human and environmental health sectors would work together to achieve better public health outcomes. One Health aims to improve health and well-being through the mitigation of risks and the management of crises that originate at the interface between humans, animals and their various environments.



Information and communication preparedness includes the development and testing of communication messages and materials to be used in the event of a pandemic or an emerging infectious disease outbreak, and the enhancement of the infrastructure for disseminating information from national to local levels and between the public and private sectors. Communication activities would support cost-effective and sustainable practices such as the marketing of face masks, hand washing and social distancing measures through various communication channels ranging from the mass media to activities in schools and workplaces. In this context, the ongoing outreach activities of ministries and sectors – particularly ministries of Health, Education, Agriculture and Transport have been prioritized and further support has been provided for:

- information and communication activities to increase the awareness and engagement of government, private sector, and civil society;
- activities to raise awareness, knowledge and understanding among the general population;
- activities to communicate the risks and potential impact of the pandemic and to develop multi-sectoral strategies to address it. In some countries, community mobilization, especially in rural areas, takes place via institutions that reach the local population such as places of worship and tribal or sect leaders.
- in addition, support would be provided for the development and distribution of basic communications materials for the general public on COVID-19 and general preventive measures, such as question-and-answer sheets, fact sheets or “dos and don’ts”.
- information and guidelines for health care providers such as:
 - o training modules (web-based, printed, or video), and
 - o presentations, slide sets, videos, and documentaries.

Although the COVID-19 pandemic started out as a health crisis, together with the measures taken to combat it, it has also become an economic crisis all over the world. Various global economic outlook reports have forecast that the global Gross Domestic Product (GDP) will contract by 3–8% in 2020 due to the impact of COVID-19 (WB, 2020) (OECD, 2020). According to the GDP figures announced by TURKSTAT on 31 August, Turkey’s GDP decreased by 9.9% in the second quarter of 2020. In the services, industry and construction sectors, GDP decreased by 25.0%, 16.5% and 2.7% respectively in the second quarter of 2020 compared to the previous year. However, GDP in the agriculture sector increased by 4.0%. There were also increases in information and communication activities (11.0%), finance and insurance activities (27.8%) and real estate activities (1.7%) (TURKSTAT, 2020).

The overall economic impact of COVID-19 is expected to be much greater than that of previous global economic crises, such as global economic crisis of 2007-2008. According to the World Bank, economic impact could push about 100 million people into extreme poverty (WB, 2020). The International Food Policy Research Institute (IFPRI) estimates that the economic contraction in 2020 could increase the number of people living in extreme poverty by a staggering 20% or 140 million, which will result in a heightened level of food insecurity in many countries (IFPRI, 2020). According to FAO, soaring unemployment rates, income losses and rising food costs are jeopardising food access in developed and developing countries alike. Each percentage point drop in global GDP is expected to result in an additional 700,000 stunted children. Smallholder farmers and their families, food workers in all sectors, and those living in commodity- and tourism-dependent economies are particularly vulnerable (FAO, 2020). Arguing that the global recession could leave an additional tens of millions of people hungry, especially in poor countries reliant on food imports, the FAO developed recommendations for the policy measures that countries could implement right from the beginning of the crisis (FAO, 2020); (IFPRI, 2020); (Elleby, 2020).

Drawing attention to the development aspect of COVID-19, UNDP points out that tackling COVID-19 is also a humanitarian and development challenge, particularly in countries already weighed down by fragility, poverty and conflict. The pandemic has unleashed a human development crisis since it is seriously affecting all the constitutive elements of human development: income (with the largest contraction in economic activity since the Great Depression), health (potentially leading to a potential additional 6,000 child deaths every day from preventable causes, for example, in addition to the direct death toll) and education (with effective out-of-school rates – which account for the inability to access the internet – in primary education expected to drop to the levels of the actual rates of the mid-1980s) (UNDP, 2020).

Nevertheless,

Considering the adverse impacts on vulnerable rural people and given the magnitude of the challenge presented by the crisis, IFAD has launched a multi-donor COVID-19 Rural Poor Stimulus Facility (RPSF). This facility seeks to improve the resilience of rural livelihoods in the context of the crisis by ensuring timely access to inputs, information, markets and liquidity (IFAD, 2020).

Governments themselves have also taken many policy measures to reduce the negative impacts of COVID-19. A selected set of the measures and regulations that have been adopted for the agricultural sector in the world and in Turkey are briefly mentioned in the following sections.

2.1. Situation in the World

Policy responses

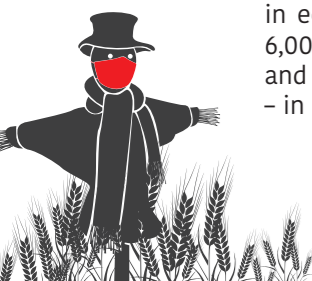
At the beginning of the COVID-19 pandemic, the first measures taken regarding the agricultural sector were aimed at compensating for the increase in demand for food that occurred in almost all countries. In other words, governments first strived to ensure the flow of food to the markets. They also became fully aware of the risks to food availability and made efforts to safeguard the supply of inputs, especially labor, in order to maintain production.

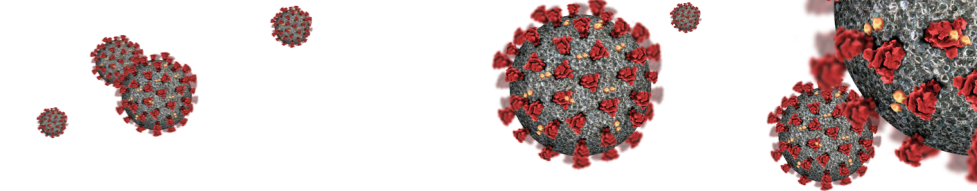
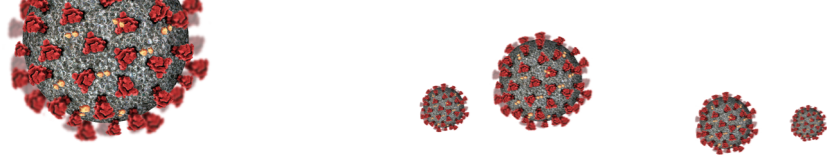
In China, where the first case of COVID-19 was reported, the State Council set up a Joint Prevention and Control Mechanism on 21 January 2020. The policy documents on food and agriculture released by the Mechanism envisaged strong support for ensuring the stable production and supply of agricultural products during the pandemic. The “food basket” Mayor Responsibility Mechanism (initiated in 1980s) was highlighted, urging effective implementation at local level to guarantee food supply. Therefore, the Ministry of Agriculture and Rural Affairs (MARA) established a sub-group specifically working on the “food basket” under the leadership of the logistics support working group of the Mechanism. The work of this sub-group includes overall production scheduling, facilitating technical services in production, matching production with markets, and solving problems in the food supply chain through multi-channel and multi-level coordination.

In order to ensure production, production regions were categorized according to their risk levels. In low-risk regions, production is required to resume completely while measures are taken to prevent imported cases. In medium-risk regions, production is resumed step by step with necessary control measures for pandemic in place. In high-risk regions, resuming production is carefully organized by requiring farmers to go to their fields separately at different times while major efforts are focused on pandemic control.

These differentiated pandemic control measures can be further adapted locally. For example, in Xiangyang City in the Hubei province, green, yellow and red zones are identified, representing risk levels ranging from low to high. Farming activities are allowed in the green zone provided temperature measuring, proper sanitation and self-protection are carried out; in the yellow zone, farming is monitored by a team leader and farmers are required to work separately in the field; in the red zone, farming activities are prohibited.

Regarding labor shortages, local governments suggested farmers make full use of migrant workers returning from the cities and develop mutual aid systems within villages to complete harvesting, with all due precautions being taken. To ensure supplies of the agricultural inputs needed for production, governments have urged inputs suppliers to resume work and increase the workload while implementing the required precaution measures. In the case of input shortages, the government will organize supplies from input companies in other provinces. Technical services to guide and support farmers’ production are carried out both in the field and online. During the crisis, extension experts started to provide training through live streaming classes regularly – an arrangement which has been very much welcomed by farmers. Telephones and social media such as WeChat are also used to provide immediate technical guidance. In addition, financial support is provided to farmers to ensure they have sufficient funds for production. The Ministry of Finance has announced a reduction in credit guarantee fees in 2020 for agricultural entities affected by the crisis. China has also allocated 1.4 billion yuan (USD 200 million) of agricultural production disaster relief funds to support pest control for major crops such as rice and wheat, with preferred allocation to Hubei province (FAO, 2020). To ensure transportation of agricultural products and inputs, vehicles delivering agricultural supplies are allowed to pass through the ‘green channel’ at roadblocks (Chen, 2020).





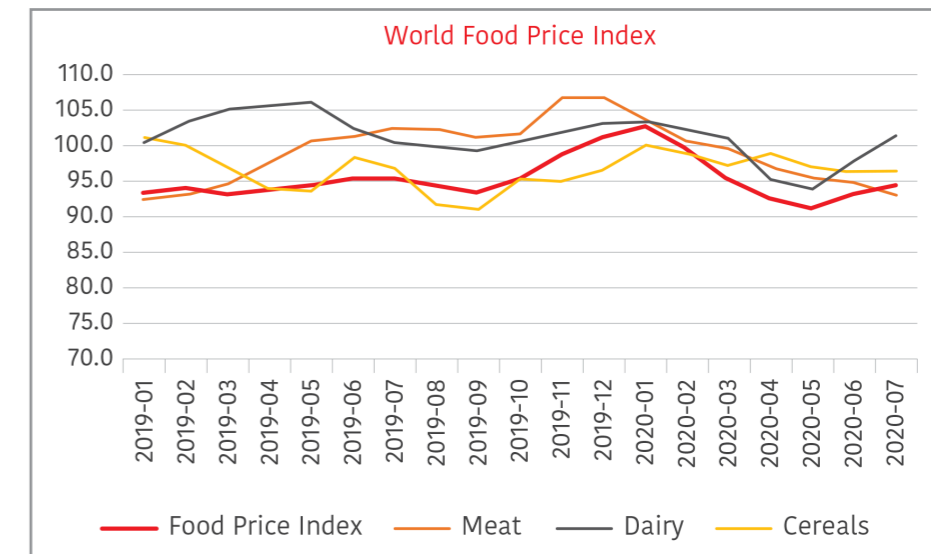
In the European Union, the EU Commission issued practical advice and guidelines on the movement of goods and critical workers in order to keep food flowing, and launched exceptional measures to support and stabilize agricultural markets, including private storage aid, authorization for the self-organization of producers/operators and flexible use of market support programs. It also simplified Common Agricultural Policy (CAP) procedures to guarantee that beneficiaries will continue to get the support they need during these challenging times (EU, 2020). The EU allowed Member States to use rural development funds to compensate farmers and small agri-food businesses up to certain amounts. The EU's exceptional measures were announced on April 22nd to provide concrete support, send the right signal to the markets and provide stability. The increased flexibility regarding Common Agricultural Policy rules aims to alleviate the administrative burden on farmers and national administrations (EU, 2020).

In the United States of America (USA), a Coronavirus Food Assistance Programme (CFAP) has been introduced to assist farmers, ranchers and consumers in response to the COVID-19 national emergency. USD19 billion has been provided to ensure critical supplies and maintain the integrity of food supply chains, to ensure that the population continue to receive and have access to food. The programme provides USD16 billion in direct support, based on actual losses, for agricultural producers where prices and market supply chains have been impacted and for producers facing additional adjustment and marketing costs due to lost demand and short-term oversupply caused by COVID-19 during the 2020 marketing year. The remaining USD3 billion is allocated for the purchase of fresh produce, dairy products and meat (USDA, 2020).

The situation in the agri-food markets

Demand for food was high in national and global agri-food markets during the first few weeks of the outbreak. This was mainly attributable to the precautionary behaviour of consumers worried that they would need to have enough food for their families at such a time of crisis with people staying at home. The excessive demand for food continued for few weeks and then stabilized. According to FAO, as most markets are braced for a major global economic downturn, the agri-food sector is likely to display more resilience to the crisis than other sectors (FAO, 2020). Furthermore, the policy responses to COVID-19 have helped to keep global food prices stable, and they have not fluctuated as much as in previous global downturns. In fact, the global food price index has decreased slightly by comparison with the pre-COVID-19 period. The index fell by 5% between February 2020 and July 2020 (The pandemic was declared in March). It is not clear whether this decline was due to COVID-19 or not. In certain food commodity groups, FAO reported minor changes in markets related to COVID-19. For example, the meat price index is a little lower on account of the pandemic. Logistical bottlenecks and a steep decline in demand from the food services sector due to lockdowns has led to a global slump in import demand, causing international meat prices to fall, with the sharpest drop registered for ovine meat, followed by poultry, pig and bovine meats. Plummeting food service sales have resulted in meat stock accumulation, especially in premium categories and in bulk packaging, enlarging export availabilities and weighing on international meat prices, despite a decline in meat output caused by labor shortages in slaughterhouses, processing and packing due to the pandemic (FAO, 2020), (Figure 1).

Figure 1. World Food Price Index (January 2019- July 2020)



Source: (FAO, 2020)

Regarding the supply and demand of the main agricultural commodity groups, FAO forecasts that there will be no significant change due to COVID-19. For example, world cereal output is forecast at 2,780 million tonnes – nearly 70 million tonnes higher than in 2019, setting a new record high. Following a slowdown in the demand for coarse grains caused by COVID-19 in early 2020, total utilization has regained momentum. In oil crops, production is expected to decline from the record levels set in the previous season. In the USA, adverse weather conditions have led to a sharp fall in soybean planting and yields, while global rapeseed output was affected by further planting area contractions in the EU and Canada. World total meat production in 2020 is forecast to fall to 333 million tonnes (carcass weight equivalent), 1.7 percent lower than in 2019, while world milk production is forecast to grow by 0.8 percent to 859 million tonnes, mostly owing to expected expansion in production.

After the initial shock and drop in dairy prices at the start of the COVID-19 crisis, global prices seem to have recovered for the most part. However, sector analysts warn that in much of the world lockdowns will be followed by economic recession. According to their forecasts, slower growth could result from lower domestic demand as well as curbed demand for imports in many regions (Dairy Global, 2020).

Australia has so far seen a significant recovery in national milk production and boosted dairy farmer confidence in many regions, according to Australia's Dairy Situation and Outlook June 2020 report. The outlook shows that while COVID-19 has negatively impacted demand and commodity pricing due to reduced activity in food service channels like restaurants and cafes, Australian retail demand rose as consumers stocked up on dairy products.

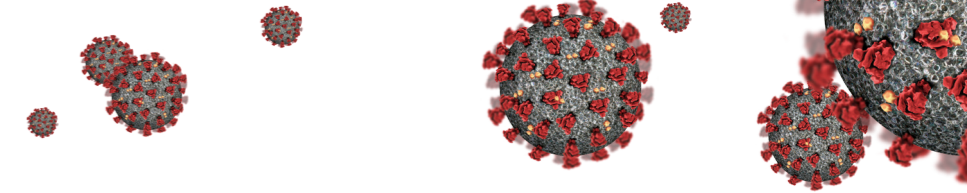
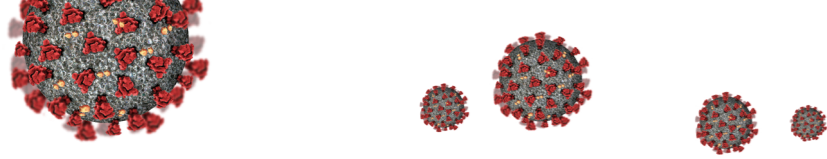
The global outlook for the dairy sector has improved significantly, but expectations will not be the same as in pre-COVID-19 times. It is thought that it will take time for food services to return to normal due to remaining capacity constraints and cautious customers.

China and South East Asia has been a critical force in driving import demand opportunities for many milk producing areas. With an expected fall in demand in this region, and lower Chinese import needs, there could be a surplus of milk, contributing to higher stock levels in the second half of 2020.

Growing demand for dairy products in China has resulted in higher global dairy prices. There were significant price increases in July (Dairy Global, 2020).

According to the New Zealand Dairy Association, milk supply from the EU, US and Latin America is increasing despite the impact of COVID-19. Uncertainty continues on how the global recession and the potential for a second global COVID-19 wave could impact demand.





Poultry production is one of the most affected sectors around the world, since the production system is intensive. Dozens of meat-processing plants have been forced to close temporarily as the industry struggles to contain the spread of the coronavirus among employees who often have to stand side-by-side while cutting and packing poultry.

Disrupted air transport has had a major impact on the distribution of breeding stock as well. The sharp reduction in global air transport caused by the pandemic could leave companies without breeding stock and hatching eggs, the International Poultry Council warned at the beginning of April. In the long-run supply disruptions could jeopardize food security globally, says the poultry processors' organization. The first to be affected by the lack of air freight will be the exporting countries. Hatching egg and day-old chick exporters in the Netherlands started euthanizing chicks and destroying eggs in March as destinations became out of reach. Bird flocks could be relocated within Europe, but transport to Africa, one of the main export markets stopped altogether.

African nations are not the only countries dependent on imports. China and especially Russia, a poultry production powerhouse, rely heavily on foreign supplies. The self-sufficiency rate for hatching eggs for day-old chicks is currently about 90% in Russia, but hatching eggs for parent stock for both layers and broilers are completely dependent on imports. Prolonged supply disruption could significantly reduce the ability of the Russian poultry industry to ensure an adequate supply of poultry meat and eggs for Russian consumers. This may be an opportunity for the Turkish poultry and eggs industry.

In the US, Canada, Europe and other countries, the COVID-19 pandemic led to 'panic buying' of groceries to stockpile food against possible future food shortages, but also the closure of many restaurants. These factors have greatly impacted the meat, dairy, poultry and eggs sectors (FAO, 2020). In European countries too, consumers found supermarket shelves bare, despite the delivery of extra eggs due to Easter peak demand. However, once packers had shifted deliveries from their closed food-service customers to supermarkets, the situation quickly normalized in the US, Canada and Europe (Poultry World, 2020).

Global egg production has been growing substantially, with latest figures suggesting a 24% increase in the past decade. The global poultry industry suffers from the high prices on the domestic and international grains market. In addition, there are difficulties in the production and import of pharmaceuticals and feed additives. For example, egg production in Kazakhstan may fall by up to 30% during the next few months as COVID-19 is driving farms out of operation and pushing others to cull their stock. The average price of feed grain has recently reached USD217 per ton, while normally grain would cost around USD145 per ton at this time of the year. The poultry price hike is linked to the pandemic (Poultry World, 2020).

The lockdowns implemented by governments have resulted in logistical difficulties in seafood trade, particularly in relation to transportation and border restrictions. The salmon industry, in particular, has suffered from increased air freight costs and the cancellation of flights. The tuna industry has reported movement restrictions for professional seafarers, including for at sea fisheries observers, and marine personnel in ports, which have prevented crew changes and repatriation of seafarers.

Shortages of feed and related aquaculture items, e.g. vaccines and chemicals for treatments to some extent have also been reported, due to restrictions on transportation and personnel travel, with particular impact on the aquaculture industry.

As a result of the drop in demand, and resulting price drops, capture fishery production in the countries where it is a major activity has been brought to a halt or significantly reduced, which has a positive effect on wild fish stocks in the short term. In aquaculture, there is growing evidence that unsold produce will be result in an increase of live fish stocks, and therefore higher costs for feeding as well as greater risk of fish mortalities.

Fish and fish products are among the most traded food products in the world, with 38 percent of fish/seafood entering international trade. At the same time, fishing and fish farming are important at the local level for the livelihoods of many fish-dependent communities, as well as for low-income countries and small island developing states.

Measures to contain the spread of COVID-19 such as the shuttering of food services, cessation of tourism, reductions in transport services and trade restrictions have caused disruption in both domestic and international supply chains. The fact that live, fresh or chilled fish, which make up 45 percent of fish consumed, are highly perishable products presents additional logistical challenges. Furthermore,

widespread containment measures can have a notable impact on nations that trade significant amounts of seafood, reducing foreign income or threatening food security. Keeping the supply chain open is fundamental for preventing a global food crisis.

In commodities, world agricultural trade suffered a shock at the beginning of the pandemic. Many countries placed export bans or restrictions on food items due to food security concerns. For example, Russia, Ukraine, Romania and Kazakhstan restricted exports of wheat, rice, rye and sunflower seeds until June 30, which is the beginning of the new harvesting season.

COVID-19 has also led to reduced productivity in food processing and distribution plants, or plant closures, due to contagion at facilities and the official measures necessary to meet before re-opening. For example, the closure of meat processing plants in the United States, Brazil, and Europe due to COVID-19 infections among employees has led to animals being euthanized as the supply chain became backed-up. Cold storage capacity has also been under increasing pressure. The tensions in several countries' domestic food systems warrant rapid attention and an examination of vulnerabilities and choke-points to avoid similar problems in the future.

COVID-19 has led to disruptions in food processing industries, which have been affected by rules on social distancing, by labor shortages due to sickness, and by lockdown measures to contain the spread of the virus. In confined spaces such as packing plants for milk or meat processing facilities, necessary social distancing measures have reduced the efficiency of operations and there is a need to ensure adequate protections for employees. Many firms have also reported high rates of worker absence. In France, for example, staff availability was reduced by up to 30% in meat processing facilities in the regions of the country worst hit by COVID-19 (Harvey, 2020).

Meat processing is a labor-intensive operation. Therefore, the meat sector appears to be more sensitive than other types of food processing, in part because COVID-19 clusters have been found in meat processing plants in various countries. Employees often work in close proximity to each other, making it more difficult to respect physical distancing requirements. In some cases, workers also live together in overcrowded conditions, which further facilitates the spread of the virus.

In the United States, many meat processing plants have shut down or have been forced to operate at reduced capacity. The numbers of cattle and pigs slaughtered fell by about 40% in April compared to the same period in 2019. Low demand from meat processors has left producers in North America with unsold mature animals. Increasingly, they are forced to resort to euthanizing animals to prevent overcrowding, particularly for pigs. It is reported that conditions in Europe do not warrant such drastic measures yet.

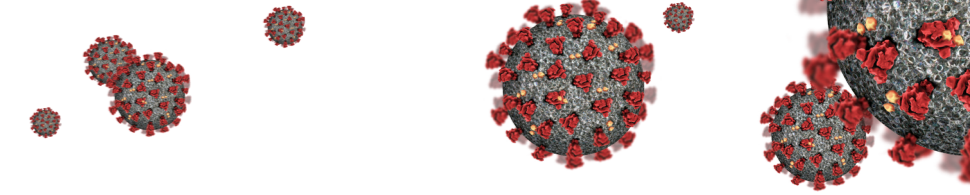
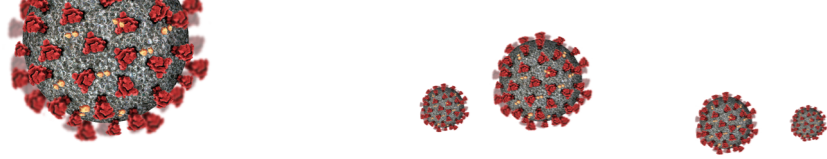
Some modes of transport have been affected more than others, bottlenecks in transport and logistics have disrupted the movement of livestock and their products along supply chains as meat and dairy products have had to be shipped in refrigerated containers and trucks.

The impact of this shift in demand is considerable. In the United States, for instance, the "food away from home" sector normally accounts for 10% of the consumption of fruit, 32% of vegetables, 25% of dairy products, 31% of cereals, and 33% of protein foods (a category which includes meat, seafood, and eggs). Across most countries, the sector accounts for at least 25% to 30% of total sales of fresh fruit and vegetables (Harvey, 2020). Shifting such high volumes to the retail sector is not easy. In addition to logistical challenges, households' consumption patterns at home are different from those away from home. For example, food away from home tends to use more cheese (e.g. as topping on pizza) than consumers use at home, and also involves more expensive meat cuts (e.g. steaks vs minced meat at home).

2.2. Situation in Turkey

Like many other countries, Turkey introduced some measures to prevent the spread of disease such as mandatory quarantines, weekend and holiday curfews, closing stores and bans on outdoor activities. Most of those measures were taken in line with the suggestions of the Coronavirus Scientific Advisory Board established on January 2020 by the MoH. The aim of the Board is to help decision makers develop measures in the fight against the COVID-19 pandemic. In March, Provincial Pandemic Boards were also established to manage the disease at the provincial level and some agricultural representatives were appointed members of the Provincial Pandemic Boards. The Unfair Price Evaluation Board was to regulate any disruption of markets. It is expected to work against extraordinary price increases and stockpiling





activities, especially due to COVID-19-related commodity demand.

Policy Responses

The Turkish Government has been also taking specific measures to relieve COVID-19 Pandemic related impacts on the agri-food sector and rural areas. The main policy responses related to the agricultural sector can be listed as follows:

- Allocating funds to support small and medium-sized enterprises

The Law on Mitigating the Impact of the New Coronavirus (COVID-19) Pandemic on Economic and Social Life was enacted as a relief package – also known as the Economic Stability Shield. Generous financial resources have been allocated to companies that applied for a financing package and to small and medium-sized enterprises (SMEs) that have applied for the Support to Continue Working financing backed by the Credit Guarantee Fund (KGF) on the condition that they retain their employees. The agricultural sector also benefited from these measures. Interest free loans were provided to smallholder farmers and food processing industry for their investments and operations.

- Allowing free movements of farmers and seasonal agricultural workers

Measures regarding the agricultural sector were taken to prevent any disruption in the flow of food to the market and to continue agricultural production. Agricultural activities such as planting, harvesting and irrigation were exempted from mandatory curfews in order to sustain agricultural production and food security. A ministerial circular was issued and sent to the MoAF provincial directorates for programming the regulated movements of farmers and seasonal agricultural workers (FAO, 2020). Transportation and living conditions of seasonal workers were regulated according to COVID-19 health measures.

- Export and import measures on agri-food trade

In agri-food trade, export measures were implemented for a number of products including lemons, ethyl alcohol and onions to avoid any deficits in meeting the national demand. For some crops such as cereals and legumes/pulses, sunflower oil and oilseeds, import tariff rates were lowered to zero until their harvest periods.

- Facilitating the border crossing of vehicles carrying food

To make border crossings easier and facilitate trade during the pandemic, electronic certificates provided via email are temporarily accepted for shipments of all crops and products of animal origin. Trucks delivering medicine, foodstuffs, and medical equipment were given priority when entering the country. Foreign truck drivers making deliveries in Turkey were not subjected to the 14-day quarantine rule provided they did not present any symptoms during the health checks conducted at the border and left Turkey within 72 hours of entry (FAO, 2020).

- Early disbursement of farmer support payments and postponement of farmers' loan repayments

Some changes were made in regulations and arrangements for agricultural support payments and domestic trade. The support payments for the 2019 production year were disbursed earlier than planned. Farmers' payments of concessional loans due in May and June were postponed for six months. For the Support to the Agri-Food Investments under the Programme for Support to Rural Development, the MoAF published a circular on 5 June 2020 to postpone the operational closing dates by 3 months (the project completion dates were postponed from 29 May to 28 August 2020) taking into account the impact of the COVID-19 pandemic related restrictions imposed so far.

- Establishment of a digital trade portal for agri-food markets

At the Extraordinary Meeting of G20 Agriculture Ministers on 21 April 2020, Turkey's Minister of Agriculture announced that they would establish a digital agricultural trade portal since e-marketing is critical in the COVID-19 period. The MoAF, in association with the Ministry of Trade, Ministry of Treasury and Finance and the Union of Chambers and Commodity Exchanges of Turkey (TOBB) launched a Digital Agriculture Marketplace Platform called DITAP on 29 April. DITAP's stated aim is to promote contract farming through the effective use of digital platforms. Voluntarily participating producers will get access to preferential credit opportunities to be offered by banks in response to their intention to engage in contract farming. The first phase of the DITAP Programme aims to cover fruits, vegetables and legumes and around 10% of

fruit and vegetable production is expected to go through the digital marketplace in time. The second phase will cover livestock and meat products as well as inputs like fertilizers, pesticides and seeds (FAO, 2020).

- Interventions, regulations and promotion activities in food markets

A number of measures were enforced on food sales and food markets. MoAF distributes information booklets on COVID-19 related hygiene and good handling practices to farmers, agricultural, livestock and food enterprises and consumers countrywide through its local directorates. Local markets have been re-arranged to comply with COVID-19 measures. All food is started to be sold packed and customers are not allowed to handle food while selecting. Price changes and stock levels of products which are suitable for storage, such as wheat, potatoes, pasta, onions and citrus are monitored. Price changes and stock levels are strictly controlled by MoAF in cooperation with Ministry of Trade. Upon price fluctuations in dry beans and lentils, which are in high demand among consumers concerned about COVID-19, MoAF started to support spring sowing of these products by subsidizing the cost of seeds by 75% in 15 targeted provinces. In addition, another measure is allocation of the state lands to the farmers. In order to secure production, MoAF in cooperation with the Ministry of Environment and Urban Planning started to allocate state lands to the family farmers without any charge for strategic crops such as cereals, pulses, oilseeds and forage crops.

Inspections and monitoring were increased for COVID-19 hygiene precautions in food products, throughout all stages of food preparation, during the supply of inputs and in the handling of products of animal origin. The other measure taken by MoAF is wastewater monitoring. Since the ways of transmission are not known very well, a system has been established to monitor and evaluate the Covid-19 virus in wastewater against the risk of contamination.

On 9 June 2020 MoAF issued a Communiqué on Rules of Support for Raw Milk and the Regulation of the Dairy Market in 2020. The Regulation aims to provide support for raw milk delivered to a processing plant. As a new practice, the Regulation also provides support for the clean disposal of any excess raw milk from the production of dairy products processed by producers' unions and later delivered to the Meat and Milk Board, a state economic enterprise (FAO, 2020).

The MoAF has also been in close cooperation with the food industry and retail chains to avoid any shortages in the food market. The MoAF started to coordinate the logistic and distribution of agricultural products together with other governmental institutions for their continuous flow.

Turkish Grain Board (TMO) have continued to sell cereals and pulses until the end of the wholesale season, along with staples like rice, chickpeas and lentils.

Regarding fisheries and the aquaculture sector, MoAF organized two rounds of the discount aquaculture fish sales campaign in April 2020 using slogans like Evde Hayat, Tabakta Balık [Life at Home, Fish on the Plate] to shift collapsed export and service sector demand to household consumption. Furthermore, a communiqué was published in the Official Gazette on June 12 subsidizing processed aquaculture products like salmon, trout, gilt-head bream, sea bass, carp, meagre and tilapia with the aim of increasing domestic consumption, as export demand for Turkish aquaculture products has fallen considerably. Producers supplying aquaculture products to chain retailers were to be granted support of TRY2 per kilogram up to 100,000 kilograms (FAO, 2020).

- "Agriculture and Forest Academy" Portal

A digital training platform was established by MoAF called "Agriculture and Forest Academy" portal. The MoAF's training and extension resources were added to this portal. The portal has more than 200 topics in the field of agriculture. Online trainings were also provided and users (farmers, technical personnel, researchers or other users) have a continuous access to the content.

The situation in the agri-food markets

With the help of the measures taken, no interruption had been experienced in food production and food availability in Turkey as of September 2020. However, the prices of agricultural products tended to increase during the COVID-19 outbreak. Comparing July 2020 prices with February 2020 prices, the pre-pandemic month, the price index is seen to have risen by 3.2% (Figure 2). Part of the increase may be due to COVID-19 but there are also other macroeconomic factors driving changes in prices.



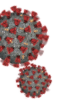
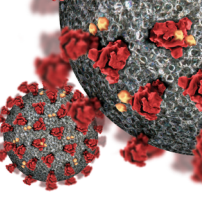
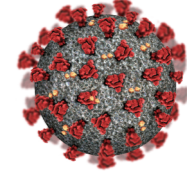
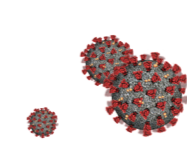
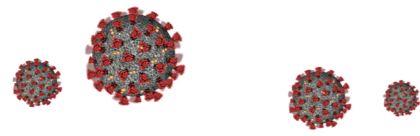
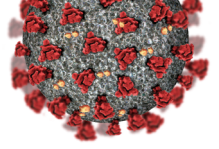
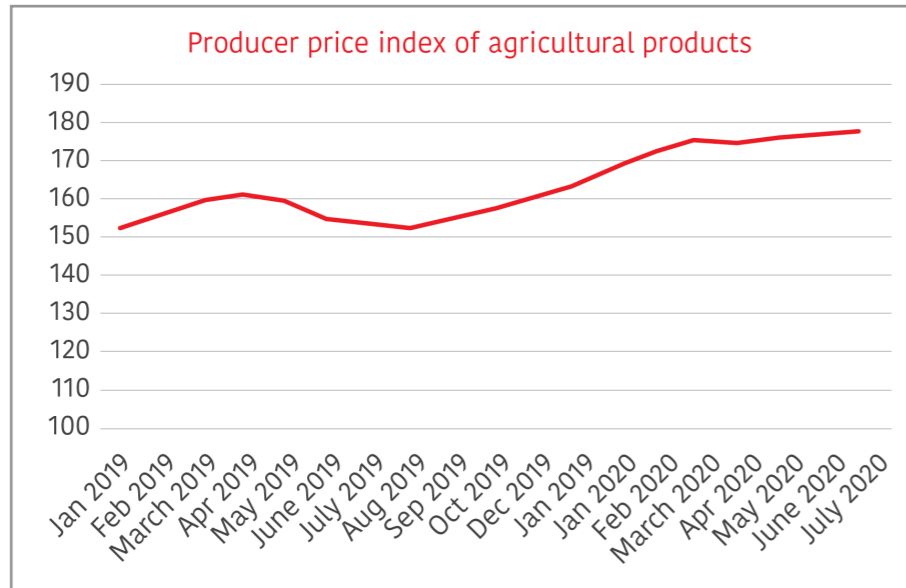


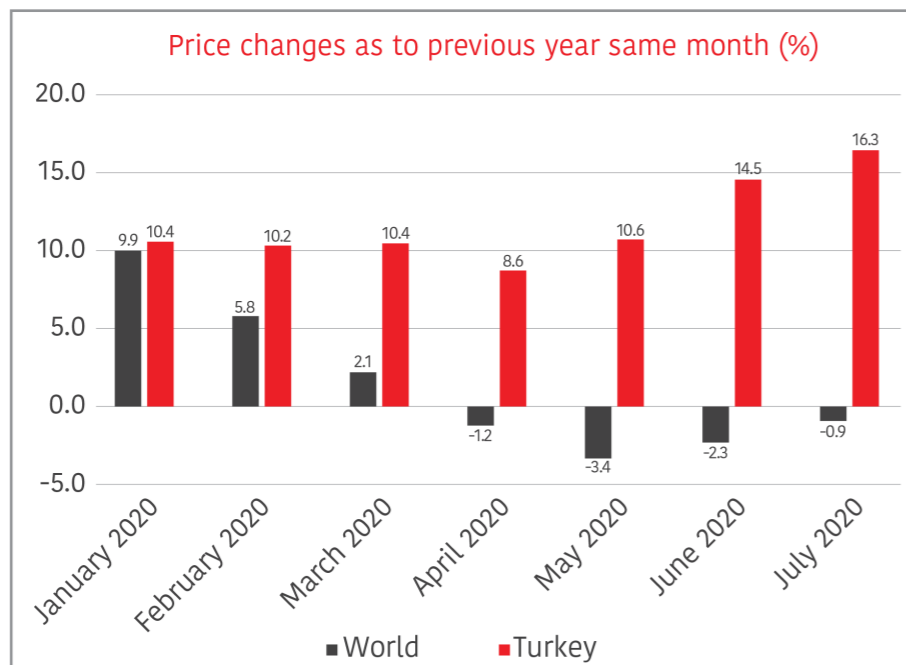
Figure 2. Producer Price Index for agricultural products (January 2019- July 2020) (2015=100)



Source: (TURKSTAT, 2020)

When the changes in producer prices for food are compared over the same period of the previous year in Turkey the global statistics during pandemic, it is found that while world prices were falling, domestic prices in Turkey rose in the April-July period. One of the reasons for this price change may be the collapse of demand in the world markets. The fall in demand in Turkey and falling prices may have been compensated by structural inflation and a partial dependence on imports, with the Turkish Lira highly unstable and generally depreciating (Figure 3).

Figure 3. Agri-food price changes over the same month the previous year (%)

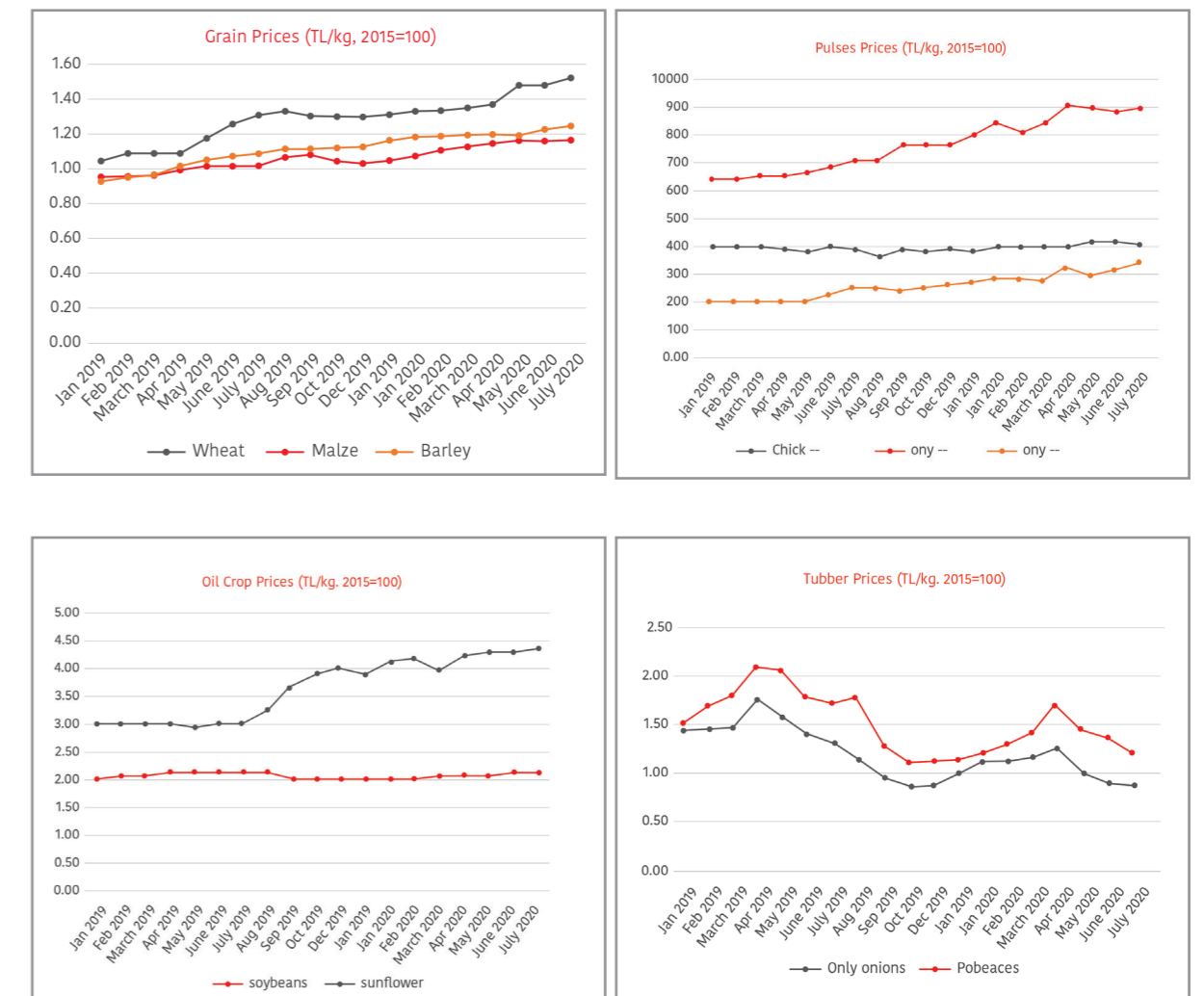


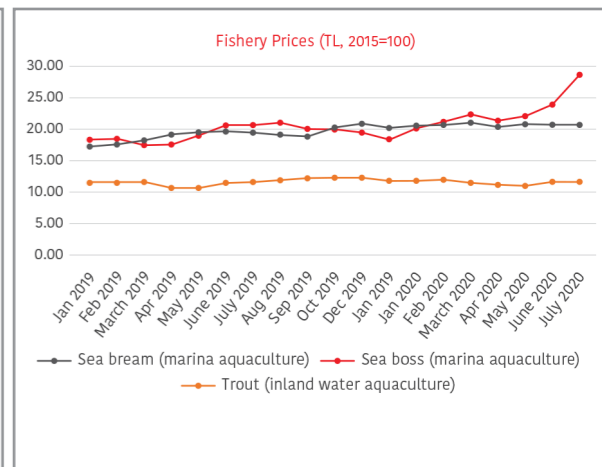
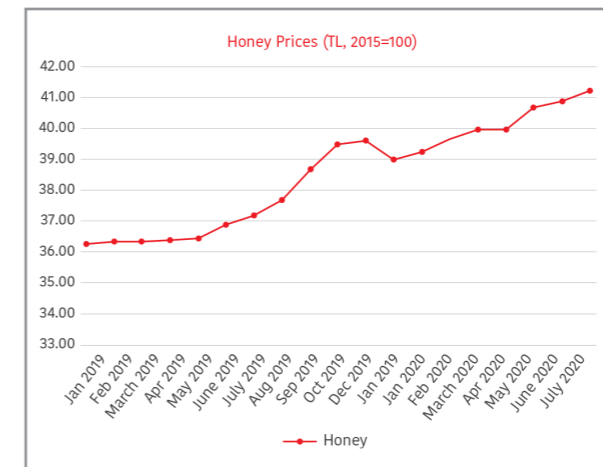
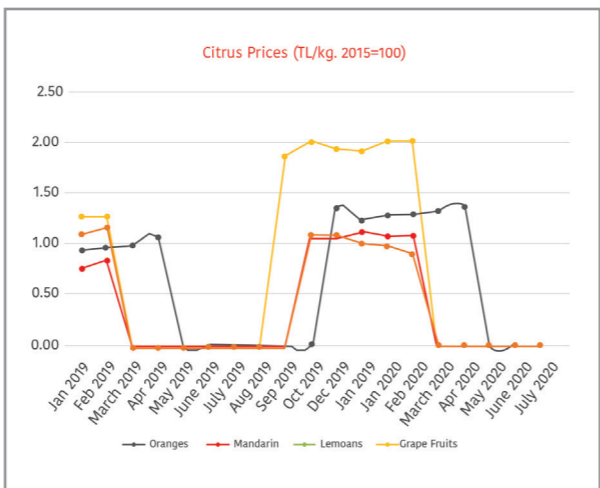
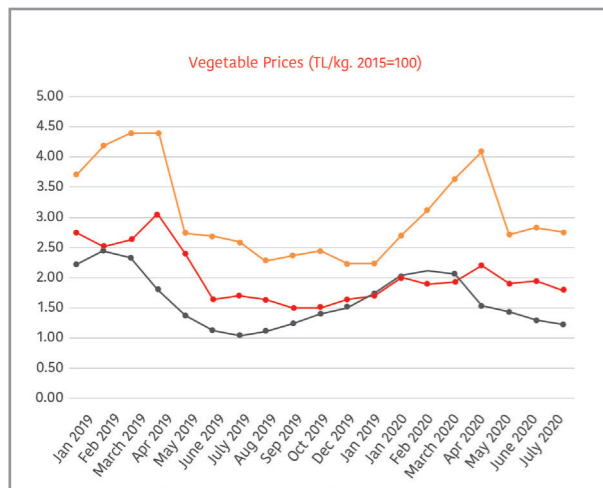
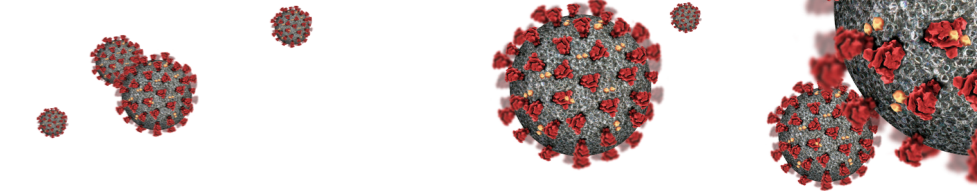
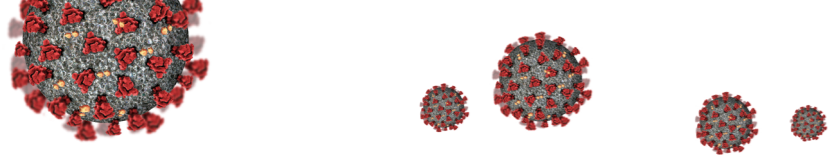
Source: (FAO, 2020) and (TURKSTAT, 2020)

In terms of product groups, prices of grains, pulses, oil crops, beef, mutton, milk and honey followed an upward trend, while tuber crops and vegetable prices followed a downward trend and eggs and fishery prices were stable in the March-July period (see the figures below). Price formation in the agricultural sector depends on many factors including the structure of the product market, harvest periods, stocks, weather conditions, structural problems and exchange rates. It is difficult to establish to what extent the monthly changes in prices are related to the COVID-19 situation (Figure 4) as there are currently no scientific studies dealing with price changes.

For agricultural input prices, TURKSTAT data indicate that the energy expenses index was down by 8%, and the veterinary expenses index was down by 6% in the January-June 2020 period. However, the fertilizer, plant protection products and animal feed price indices rose by 5%, 2% and 6% respectively in the same period (Figure 5).

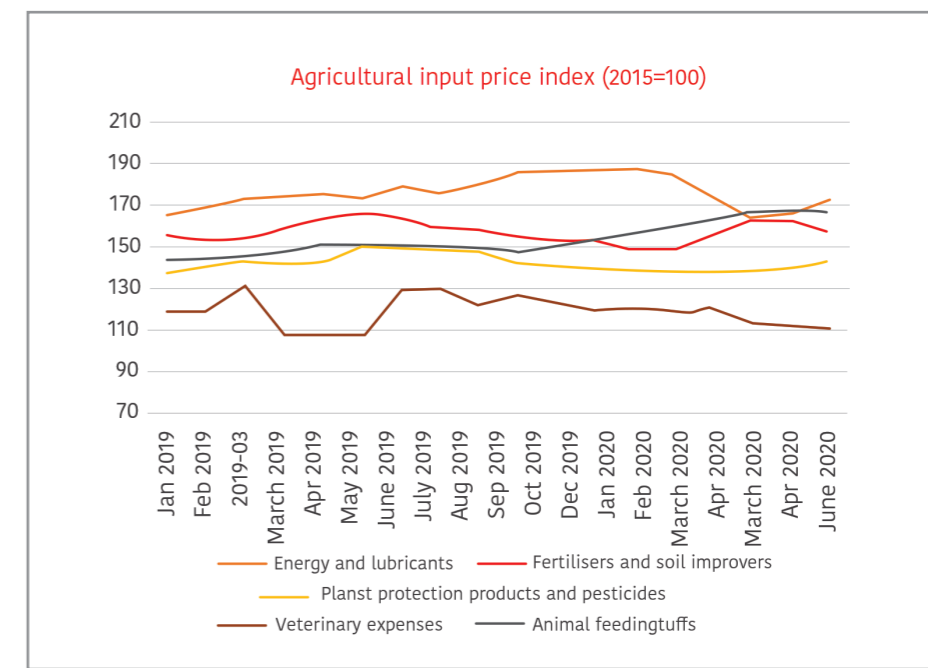
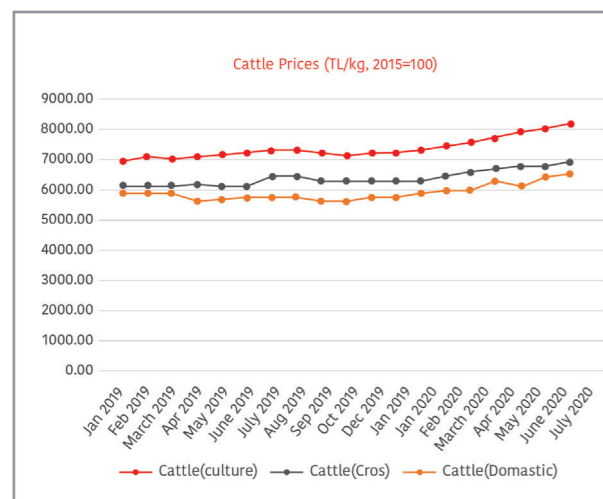
Figure 4. Price changes in agricultural product markets



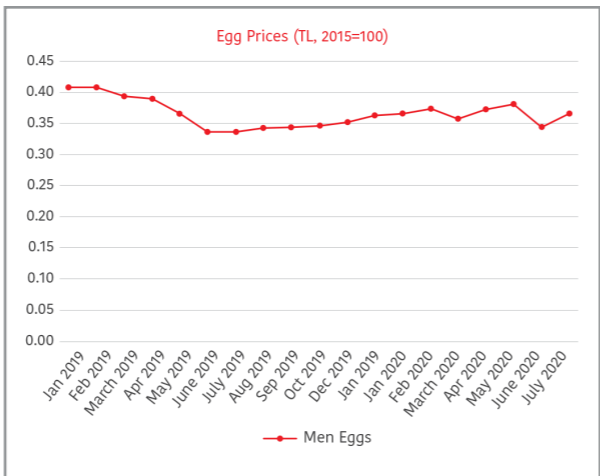
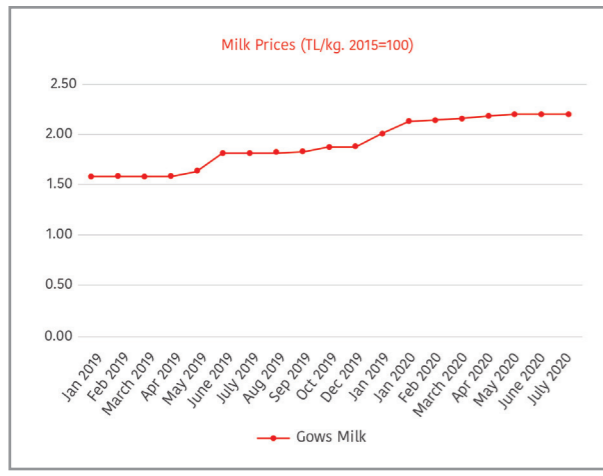


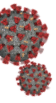
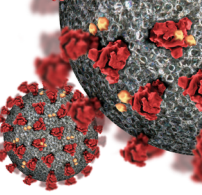
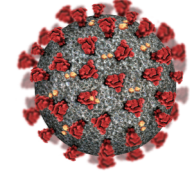
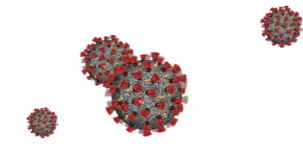
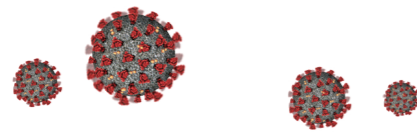
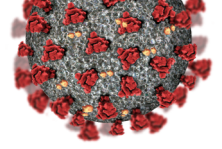
Source: (TURKSTAT, 2020)

Figure 5. Agricultural input price indices (2015=100)



Source: (TURKSTAT, 2020)





3. THE STUDY AND IMPACT ASSESSMENT METHODOLOGY

Although people in rural areas live further apart than in cities and their livelihoods tend to be more closely tied to the natural environment, they have also been hit hard directly in terms of household income and indirectly through agricultural production. Considering the relatively slow responsiveness of agricultural production because of its biophysical nature, governments make every effort to keep the gears of their agri-food supply chains moving in order to avoid food shortages and to effectively combat the adverse effects of COVID-19. Any disruption to the agri-food chains not only hurts farmers, retailers and consumers but also seriously damages rural economies where 80 per cent of the world's poorest people live. Turkey's rural areas are no exception. Further, specific policy interventions in agriculture play a key role in mitigation and recovery responses for COVID-19. Studies show that economic growth in agriculture is two to three times more effective at reducing poverty than growth in any other sector.

The objective of this rapid assessment study is to analyze the agri-food sector and resilience of rural communities and map the critical impacts of COVID-19 with a view to help identify and elaborate options for policy recommendations to mitigate COVID-19 impacts. The method the study uses to this end is detailed below.

3.1. Structure of the Study

The study was conducted by a multidisciplinary team of national experts under the joint supervision of representatives from FAO, IFAD and UNDP. The multidisciplinary team led the data collection, analysis and report writing. The method of the study consisted of the following stages: preparatory work; development of data collection tools; data collection, and data processing and analysis.

The methodology of the study includes:

- i) Qualitative data collection through secondary sources from national and international statistics, reports on COVID-19, FAO briefing notes;
- ii) Qualitative data collection through primary sources from face-to-face surveys and telephone interviews with farmers and stakeholders such as key officials at ministries and local authorities, policy makers and value chain actors including private sector representatives;
- iii) In-depth interviews / group discussions with project beneficiaries in targeted provinces, particularly the most vulnerable groups, in order to understand the impact on livelihoods and disrupted value chains.

The main sources used in the study are:

- National and international statistics,
- National and international reports on COVID-19,
- FAO briefing notes
- Questionnaires for stakeholders in the agricultural sector,
- Questionnaires for small family farms,
- Notes on focus group meetings,
- Telephone interview notes with key persons.

Desk studies were initially carried out in the preparatory phase. An evaluation study was undertaken to establish existing information, the information needed and the approach to collecting this information.

As surveys and interviews were planned to collect data from stakeholders, draft questionnaires were prepared in line with the purpose of the study. The functionality of the questions was tested through a pre-test study of the draft questionnaire held in Polatli, a district of Ankara and a center for agricultural production and marketing. Some questions were removed and others added to the questionnaire according to the preliminary results of the pre-test study.

The study was designed to use qualitative and quantitative approaches concurrently, in order to reveal the effects of COVID-19 in the agri-food sector in all its dimensions. An approach that combines the advantages of quantitative and qualitative research techniques was adopted.

In order to define the stakeholders and sample size, the numbers of main stakeholder groups in the agricultural sector was obtained from statistical information sources. There are 81 provincial directorates and 923 district directorates of the Turkish Ministry of Agriculture and Forestry (MoAF). Potential target groups were determined following the same approach in Table 1.

Table 1. Potential target groups according to 2017 figures

Name of the Institution/NGOs/Persons	Number
Province	81
Districts	923
Chamber of Agriculture	765
Farmers registered to National Farmers Registration System	2,132,491
Cooperative Unions	132
Unit Cooperatives	7367
Producer Unions (Law no. 5200) (active)	878
Breeding Associations	296
Agricultural commodity exchange boards	113

Due to the time constraint, the scope of the study, restrictions on movement of citizens and the risk of spread of COVID-19, a prioritization process was carried out.

The number of questionnaires was determined following the same approach in Table 2.



Table 2. Number of questionnaires for target groups

Contact	Number of farmers and stakeholders	Description/Notes
MoAF	5	
Chamber of Agriculture	3	All products and general situation
Cooperative	4	Crop production + animal production
Producer Union	6	Crop production + animal production + fisheries
Input providers + Industry	51	Crop production + animal production
Commodity Exchange Boards	2	Grains
Wholesale fresh fruits and vegetables	6	Crop production
Seasonal worker intermediaries	3	Each intermediary needs to have represented approx. 500 workers
Farmers	50	Crop production + animal production
Total	130	Number of surveys

The agricultural products and groups covered by the study are as follows:

i. Crop production:

- a) Grains & Pulses
- b) Roots & Tubers
- c) Fruits & Vegetables
- d) Processing industry

ii. Livestock

- a) Meat and meat products
- b) Milk & Dairy Products
- c) Poultry meat and Eggs
- d) Honey production
- e) Processing industry

iii. Fisheries and Aquaculture

iv. Feed & Additives

v. Major agricultural input providers

vi. Other Products (mushrooms, non-wood forest products, herbs)

Rural resilience and livelihoods were also taken into account in terms of:

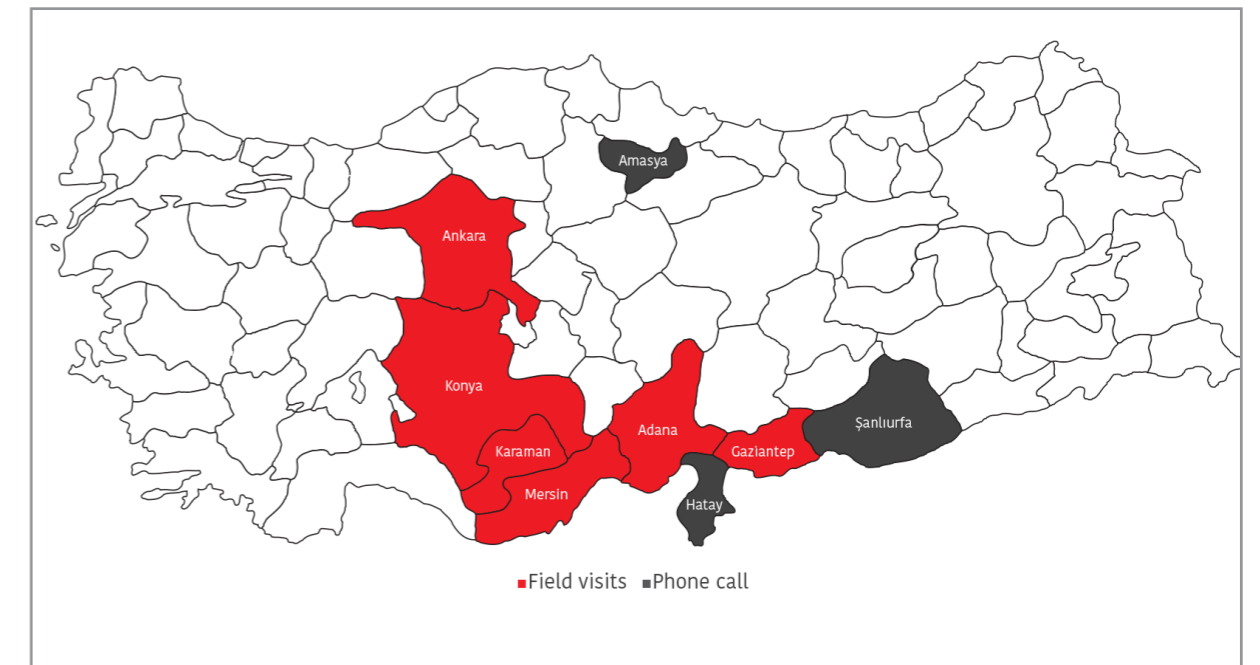
- a) Gender, Children and Youth,
- b) The labor market (working conditions, labor rights, informal workers, temporary seasonal agricultural workers),
- c) Rural jobs and incomes
- d) Rural development project areas

3.2. Survey and Preliminary Findings

Data were collected via questionnaires in the face-to-face survey and through phone calls during field visits. Physical distancing and personal hygiene rules were followed stringently. The selected provinces (Ankara, Konya, Karaman, Adana, Mersin, and Gaziantep) are shown on the map below.

The criteria for the selection of provinces was that they should be home to IFAD-funded projects and be major producer regions of staple product groups such as grains, fruits and vegetables, dairy products, and meat. The proximity of the provinces was also a selection criterion, as it permits easy travel by road. (Figure 6).

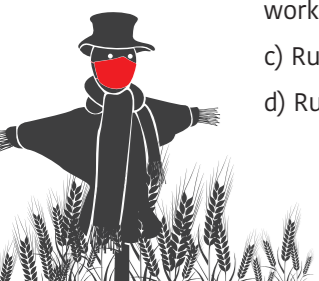
Figure 6. Selected provinces

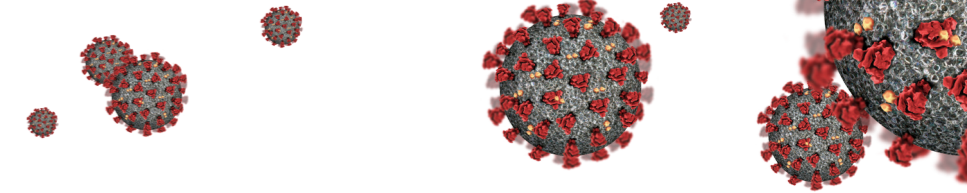
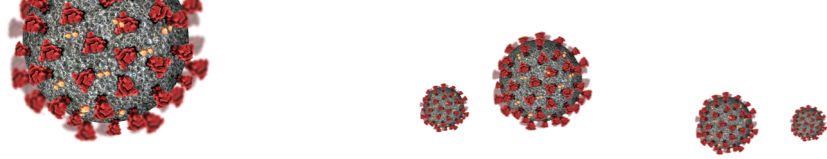


A. Survey Form for Small Family Farms

The most important data collection tool in the study is the questionnaire used in the survey for small family farms. The forms were filled in by experts carefully and in detail during friendly face-to-face conversational interviews. Information obtained through the interviews in addition to the responses to the questionnaire was also noted and later taken into consideration during the writing of the report. Efforts were made to conduct the interviews in the open air, in the farmers' yards and fields, in order to comply with physical/social distancing rules. The farmers' questionnaire form can be found in Annex-3. The questionnaire consists of the following six sections:

1. Key information about the farmers
2. Farm characteristics
3. Impacts of COVID-19
4. Policy responses to COVID-19
5. Information and training provided to the business and employees due to COVID-19
6. Questions regarding future attitudes and behavior. and suggestions





The farmers' survey began with questions about personal information for the interviewee (age, education, experience, non-agricultural employment if any, membership of agricultural organizations, length of residence in the village etc.) so as to describe the basic characteristics of the farmer. The questions about the main features of the farm business in the second section of the questionnaire encompasses crop production (area sown, amount produced, price, sales etc.), livestock production (number of animals, amounts of production, prices, labor force, sales etc.), the agricultural machinery inventory, the means of financial support used and so on. The third section, on the impacts of COVID-19 at the farmer level, contained questions on specific indicators of the economic, social, environmental, health and technology impacts of the pandemic. The questions in the fourth section, on policy responses, were intended to determine the farmers' awareness of COVID-19 related measures and supports. The fifth part of the questionnaire aimed to measure the farmers' knowledge of health and biosecurity measures. The open-ended questions in the last part were posed with a view to gauging the future attitudes and behavior of the farmers.

B. Survey Form for Stakeholders in the Agri-food Sector

The stakeholders covered by the study are:

- Ministry of Agriculture and Forestry Provincial / District Directorates
- Producer organizations and unions (Chambers of Agriculture, Unions established in accordance with Law 5200, Agricultural Development Cooperatives established in accordance with Law 1163, etc.)
- Companies that receive agricultural inputs (processors, feed factories, etc.),
- Agricultural input providers (medicine, fertilizer, feed dealers, etc.),
- Wholesalers,
- Agricultural Commodity Exchanges,
- Exporters, importers
- Seasonal agricultural workers

Before the field visits, the initial plan was to evaluate the stakeholders separately by profession. However, the relevant stakeholders emerged during the interviews. For example, a person may have more than one profession such as input provider and exporter, or producer and wholesaler. Therefore, questions were asked to each stakeholder in line with their roles in the food supply chain.

The stakeholder questionnaire form is given in Annex-4. The stakeholders in the agri-food sector were determined through an evaluation of the product groups, expertise or activity fields of stakeholders. Annex-2 shows the distribution and number of institutions, individuals and producers interviewed in each province along with other relevant information on stakeholders.

The stakeholder questionnaire consisted of the following six section:

1. Important personal information on the interviewee
2. Profile / Field of Activity and its main characteristics
3. Impacts of COVID-19
4. Policy responses to COVID-19
5. Information and training provided to the business and employees due to COVID-19
6. Questions regarding future attitudes and behavior, and suggestions

The stakeholder survey began with questions about the personal characteristics of the interviewee (age, education, experience, position, etc.). Questions about the main features of the institution followed in the second part of the questionnaire, including its legal status, activities, relationship with farmers, labor force, sales and means of financial support. The third section, on the impacts of COVID-19, contained questions on specific indicators of the economic, social, environmental, health and technology impacts of the pandemic. The questions in the fourth section were aimed at measuring the stakeholders' awareness

of COVID-19 related measures and support opportunities. The fifth part of the questionnaire aimed to measure the stakeholders' knowledge of health and biosecurity measures. The open-ended questions in the last part were posed with a view to gauging the future attitudes and behavior of the stakeholders.

In brief, the field study aimed to collect information about the following main topics:

--Some descriptive information about the farmer and the farm; structural characteristics; changes due to COVID-19:

- Socio-economic characteristics,
- Details of farms,
- Labor supply and labor characteristics,
- Economic, social, environmental, health and technological changes during the outbreak period,
- Approaches to biosafety; level of awareness
- Future views and attitudes

--General information about the stakeholders; structural characteristics; changes due to COVID-19:

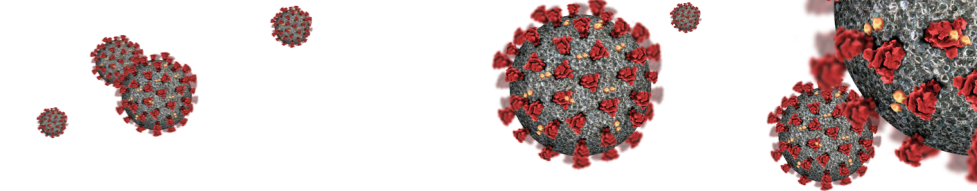
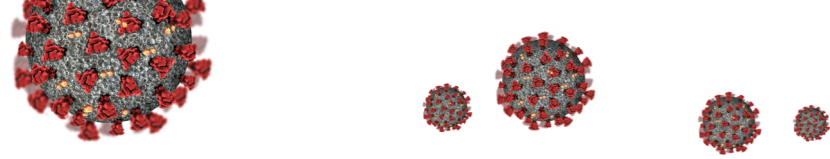
- Corporate information
- Employment in the COVID-19 period and previously, including any changes
- Changes in the economic, social, environmental and health situation and technology use during the COVID-19 period,
- Information about sales conditions including any changes in the COVID-19 period (products, customers, sales price range, problems in sales, marketing systems, promotional activities)
- Information about production, where relevant, including any changes in the COVID-19 period (total production, problems in product/raw material supply and suggested solutions)
- Information on business development issues, where relevant
- Support received in the COVID-19 period
- Approaches to biosafety and levels of awareness
- Future views and attitudes

This report is an assessment of the situation that has been observed until September 2020. It was prepared by evaluating data obtained through face-to-face questionnaires and telephone calls with a total of 130 people, including 80 representatives of institutions in the agri-food sector and 50 agricultural producers. The profile of the respondents is given in Annex-2. Upon the request of some stakeholders, focus group meetings were held in some regions in accordance with social distancing rules. Six focus group meetings were held with a total of 28 people contributing to the report. The following focus group meetings were held:

1. Woman farmers in Adana
2. Producers' Union in Konya
3. Fresh vegetable producers in Konya
4. Fresh vegetable producers in Karaman
5. Goat breeders in Karaman
6. Chamber of Agriculture in Gaziantep

The first field visits of the study began in the Polatlı district of Ankara on 6 July 2020. Visits to Konya (the Ereğli district, Adana (the Karataş, Kozan and central districts), Mersin (the Tarsus, Erdemli and central districts) and Gaziantep (the Oğuzeli district) followed on 7-15 July 2020. Meetings were also held in Konya and Ankara on 23-26 July 2020. The survey and focus group studies were completed by the end of July 2020, and the telephone interviews were completed in August 2020 to make up for missing information. The





situation of the institutions/organizations and farmers interviewed by agricultural production groups is given in Annex-2.

Before the evaluation stage, a database was created and a coding system was developed to input data, prevent incorrect data entry and perform appropriate statistical analyses. Finally, the results obtained from the analyses of the quantitative data and qualitative data were re-evaluated as a whole to obtain the overall picture.

In data analysis, the fuzzy set assumption, which is based on decisions for uncertain choices, was used. This method has been applied in numerous real-life situations in which uncertainty plays a crucial role. It permits the gradual assessment of elements in a set; this is described with the aid of a membership function valued in the real unit interval and only takes the values 0 or 1 (Zadeh, 1973) (Pandey P., 2013).

4. ASSESSMENT OF THE IMPACT OF COVID-19 ON THE AGRI-FOOD CHAINS

The COVID-19 period, while causing great anxiety and uncertainty, has clearly revealed the value of some economic activities and labor that had not been fully recognized previously. Among all the economic activities, the importance of the agri-food chain has become very well understood around the world and in Turkey during this period. In order to perform better in the sector, it is necessary to determine how the sector was affected by COVID-19 economically and to carry out comprehensive and holistic planning to minimize negative effects and maximize positive ones.

In this section of the study, the findings obtained from 130 questionnaires representing groups in the agri-food chain – 50 farmers and 80 representatives of institutions – and a number of focus group meetings are analyzed, and the findings are discussed by main product groups. The findings are presented under the following five headings:

1. Crop production
2. Livestock production
3. Fisheries and aquaculture production
4. Food industry
5. Other dimensions including government financial support, employment, the role of women and seasonal workers, biosecurity rules, and digital technology use

The findings has been obtained with the assessment of the situation until September 2020 and it could not fully cover the latter implementations or measures.

4.1. Impacts on Crop Production

4.1.1. Analysis of the Situation

Turkey has 23 million hectares of agricultural land used for annual crops, fruits, and vegetables, excluding fallow land. Of the total cultivated land area, 80% is used for annual crops, mainly cereals and other crops, and 20% of the land is used for fruits and vegetables. Wheat is the principal crop, accounting for over half of the cultivated land. The average farm size is six hectares, as most of farms are fragmented small family holdings (TURKSTAT, 2020). Large family holdings are concentrated mainly in the provinces of Konya, Adana, and Izmir. Turkey's diverse regions have different climates because of the varied topography. Thus, many kinds of agricultural products are grown in the different regions and sub-regions. There are also regional differences in other agricultural, social, environmental and economic factors. Turkey is the leading producer and exporter of many products.

Turkish farms are particularly vulnerable in times of crisis as they are small scale and family farms. However, the levels of vulnerability and impact are not homogeneous across the country. Since agricultural production systems are differ across products and regions, their exposure to crises also varies.

The findings of this study show that the impact of COVID-19 on crop production has varied greatly in terms of both product groups and regions and within the production of the same product across regions. These variations are evaluated in terms of their negative economic, social and health impacts, while the use of new technologies is regarded as a positive impact. Although positive overall, the environmental impacts are mixed: they may be considered to be negative given the combined effects of current adverse climate events or positive considering the lower use of polluting chemicals in agricultural production activities.

Stakeholders and farmers engaged in crop production were asked whether some economic parameters have changed and whether they had been affected economically during the COVID-19 period. The responses are presented in Figure 7.



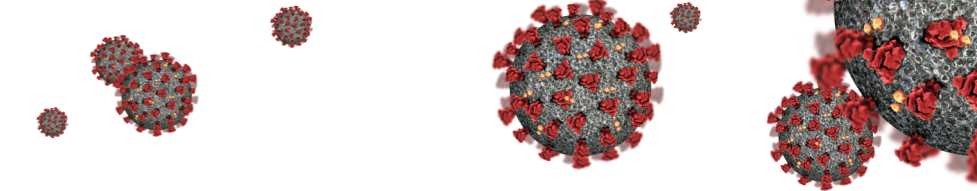
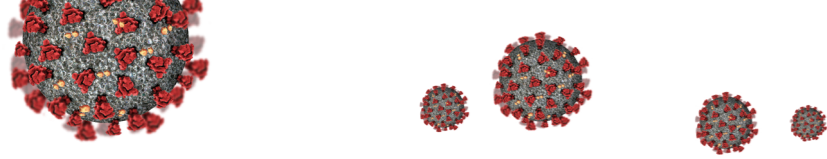
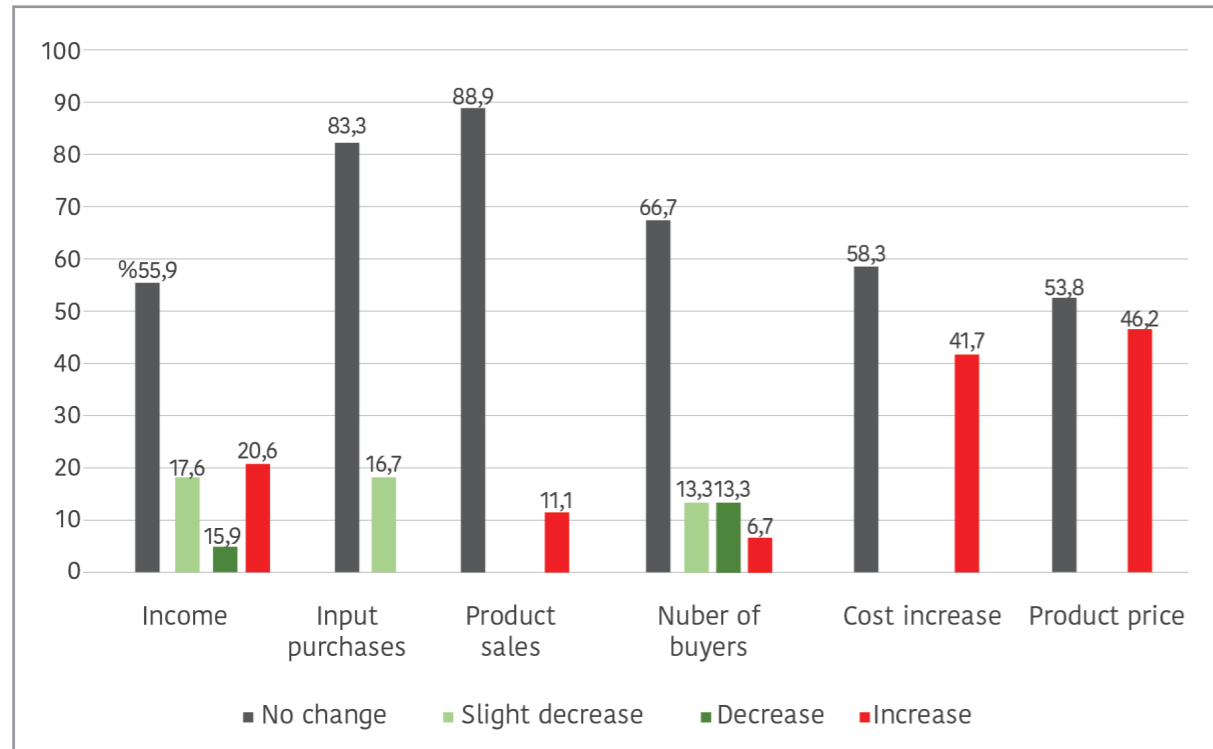


Figure 7. Crop production: Changes in economic parameters (%)



Farmers engaged in crop production reported changes in their income between the periods before and after COVID-19. It was determined that there was no change in income in product groups such as winter cereals, legumes, feed crops and industrial crops. The effects of the COVID-19 pandemic began to be felt in March 2020, while these products are in growth between March and May. Therefore, it may be said that there was generally no economic effect for products which were being grown in the early months of COVID-19. However, significant problems occurred in the harvesting and marketing activities of some crops with harvest periods in March and April. Some crops were left unharvested in the field. These were perishable products such as lettuces and spring onions with short shelf lives. The companies and farmers whose responses are given in Figure 7 reported a loss of income, especially in the marketing stage.



Photo: Erkan Pehlivan, Özdal Köksal

On the other hand, there was also an increase in income in some products in some regions with harvest periods over March and April. For example, small family farms growing fruits and vegetables in greenhouses established within the scope of the FAO projects or IFAD funded projects indicated that their income increased during this period. This may be due to a number of factors that distinguish the investment support provided by these institutions. FAO-led and IFAD-funded projects do not simply provide investment support to farmers; they also offer them training and extension services with a more holistic approach. Rural development is prioritized and the agri-food chain is fully addressed, whereas other investment support mechanisms only provide financing. Successful investment is as important as meeting the cash needs of the farmer, and is linked to training, extension, social needs and positioning in the agri-food chain. For this reason, it may be said that producers with access to extension services such as farmers' schools supported by FAO or IFAD-funded projects may have been less affected by the crisis. Aside from this, the increase in demand for some crops due to consumers' health concerns and their fears of running out of food during the lockdown period may have caused the prices of

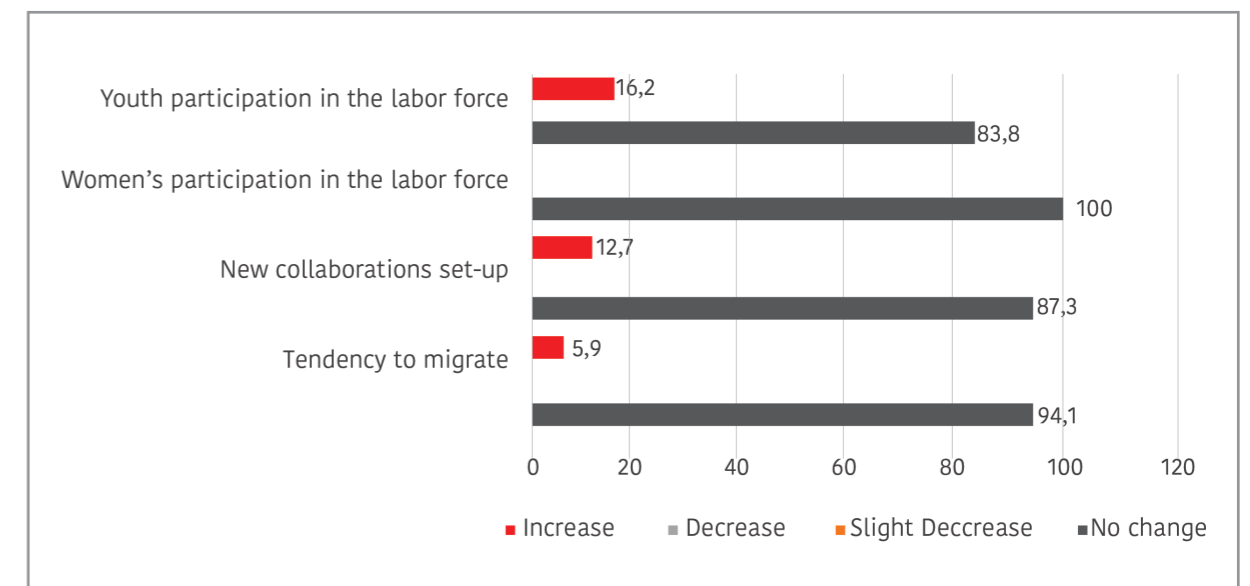
certain crops to increase, resulting in an increase in the income of all the actors in the value chains of these products.

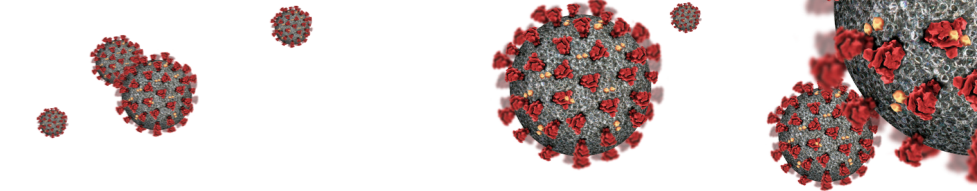
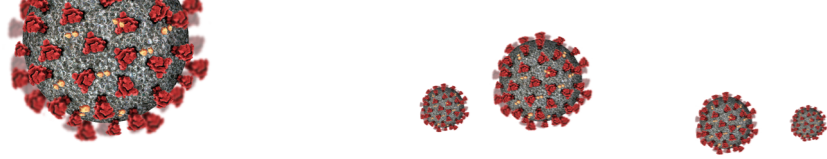
In crop production, input prices recorded one of the greatest increases compared to the pre-COVID-19 period. Other than external factors, the most important factor determining the supply of agricultural products is the timely use of agricultural inputs such as fertilizers, pesticides, seeds, seedlings and feed. Sustainable agricultural production depends on easy and uninterrupted access of producers to inputs – their ability to purchase inputs and use them in production. During the COVID-19 outbreak, no problem occurred in this area that led to the disruption of production in Turkey, thanks to the measures taken. Farmers and input providers were able to access inputs continuously. However, due to the depreciation of the lira, prices of imported pesticides, fertilizers and seeds increased. It was also stated in the interviews that these price increases were not related to COVID-19 and were fully due to the depreciation of the lira. However, this is yet to be verified by research.

In addition, pesticide and fertilizer vendors did not experience any stock-related difficulties since they had stocked up before the pandemic, mainly in January and February. Some pesticide vendors even stated that their office expenses decreased as they did not have to cater to visiting customers due to COVID-19 measures.

According to the findings, 42% of the farmers and stakeholders stated that the costs of production had increased. The main reason given for the cost increases was rising input prices. Another reason was the rising cost of seasonal agricultural workers, which reflected the higher costs of transportation and food due to COVID-19 measures. The daily wage of seasonal agricultural workers usually does not include lunch cost. Instead of lunch payment, employers prepare meals for workers and the meal offered by the employer is eaten together in groups. According to the field observations and findings, employers paid them an additional amount to cover the lunch fee to prevent gatherings for having lunches together to avoid any spread of infection among workers. This is an extra cost of farmers. In addition, the transportation costs for seasonal agricultural workers increased by an average of 20% due to COVID-19 measures and risks during the survey period. This cost increase was said to be covered by the farmers who employed the seasonal agricultural workers.

In addition to the economic changes in crop production, social changes were also experienced during the outbreak. Some survey findings on labor market issues – namely, employment, seasonal agricultural work, the participation of women and youth in employment and the ability to establish new collaborations – are presented in Figure 8.





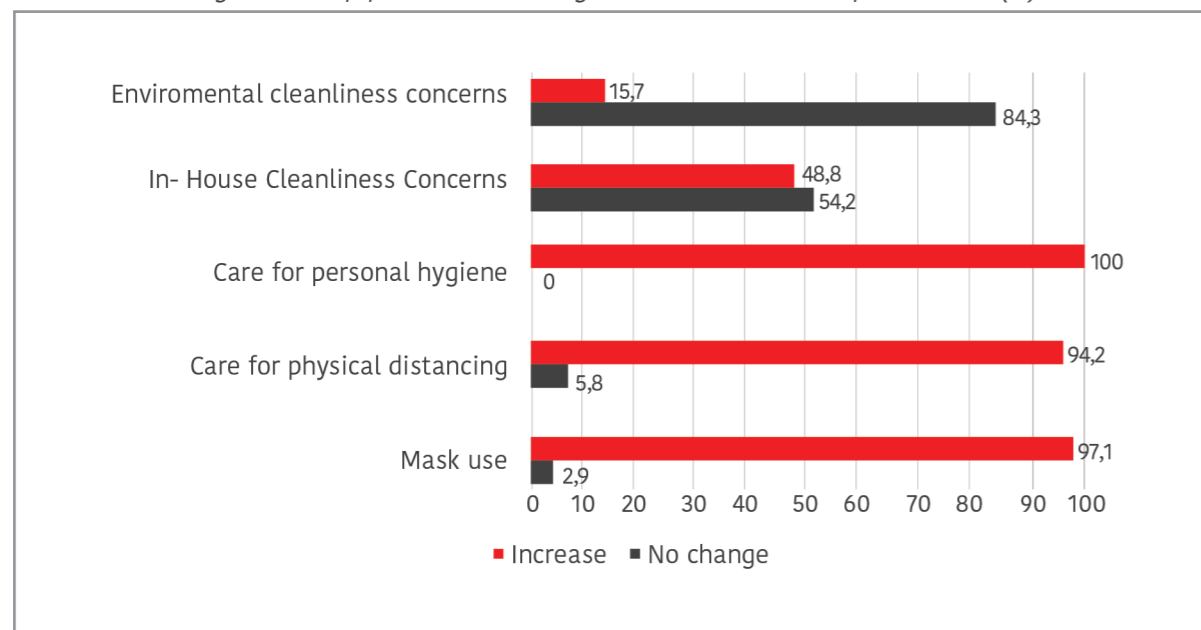
Some people previously working in the services sector – mainly in and around touristic regions – whose workplaces have been closed due to the COVID-19 situation are seen to have been employed in the agricultural sector, and particularly in greenhouse production. Overall, the pandemic led to a 12.7% increase in new collaborations (i.e., job opportunities) (Figure 8). This has led to economic as well as social changes. Stakeholders reported that greenhouse rents increased by 10-15% due to the increase in the demand for greenhouse production.

During the COVID-19 period, young people have participated much more than previously in crop production activities on small family farms (Figure 8), because of the closure of high schools and universities. This situation has led to an increase in family labor and a decrease in the need for non-household labor.

Some of the measures taken in response to COVID-19 were related to seasonal agricultural workers. Measures regulating the working, living and transportation conditions of seasonal agricultural workers were enforced. Findings indicate that people who were unemployed during the outbreak sought work at gathering centers for seasonal agricultural workers in agricultural production. For example, at one tent site in Adana, two people were encountered who used to work as cooks in Bursa but had started working in agricultural production along with their families during the pandemic.

In addition to Turkish citizens, foreign laborers (Syrians, Afghans and others) work in the agri-food sector in Turkey. The agricultural sector did not experience difficulties in terms of seasonal agricultural labor, as a result of the timely measures taken during the COVID-19 period by the MoAF. However, measures aimed at mitigating the impacts of COVID-19 prohibited agricultural workers and farmers over the age of 65 and under 18 to go to work or to their farms. This restriction created problems, as the average age of farmers is high and children under 18 often work as agricultural workers. This has had a social impact as well as an economic impact.

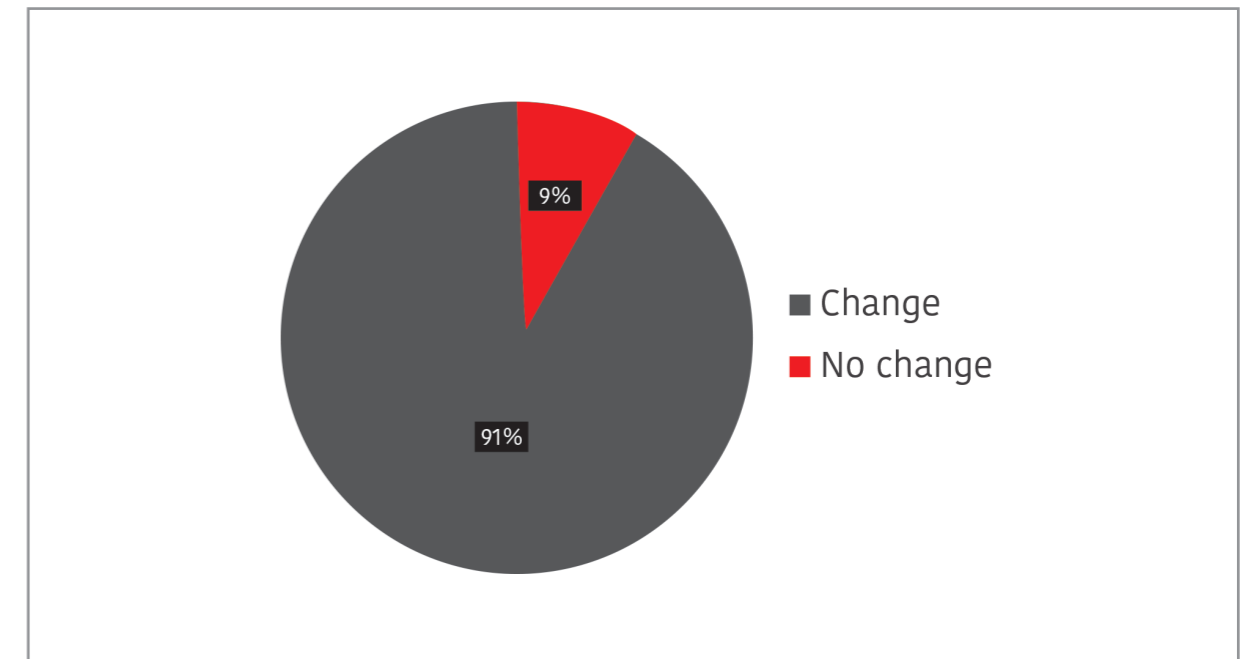
Figure 9. Crop production: Changes in selected health parameters (%)



Some health precautions against COVID-19 have been made mandatory and others have been widely recommended. As shown in Figure 9, stakeholders in crop production were found to be sensitive about health protection issues. Almost all complied with rules and recommendations concerning personal hygiene (100%), the use of masks (97.1%) and physical distancing (94.2%). In terms of in-house and environmental cleanliness, sensitivity was greater among stakeholders working in institutional settings.



Figure 10. Crop production: Uptake of new technologies (%)



Making use of new technologies is one way to mitigate the impact of any crisis. Digital tools were used significantly more than before in all sectors during the outbreak period. With restrictions and social distancing rules in place, people met in virtual environments and socialized by different means. According to study findings, there are differences in the use of new technology among stakeholders in agricultural sector. Of the stakeholders surveyed, 9% stated that they had started using new technologies during this period (Figure 10). Commodity exchanges, producer organizations and public institutions differ in their use of technology. Institutionalized stakeholders involved in crop production used technology more than others.

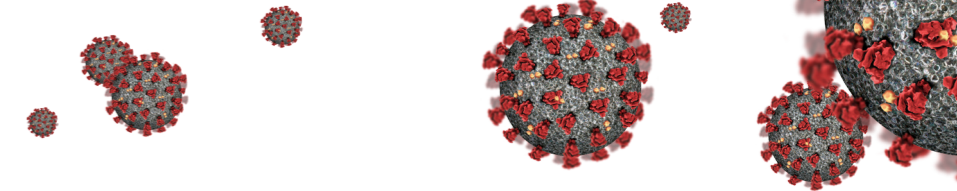
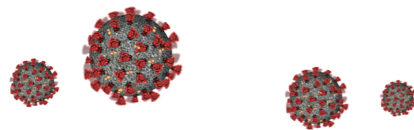
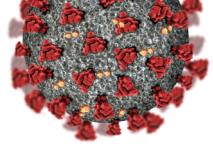
Regarding the environmental impact of COVID-19, when asked whether there had been an impact on the use of pesticides and fertilizers or organic production, stakeholders stated that there had been no change.

Analysis results indicate that the most significant future impacts on crop production are expected to be economic (0.658) and health-related (0.617). The stakeholders in the crop production group considered the economic impact likely to be the more significant. Social impacts and technology uptake follow, with environmental impacts considered likely to be the least significant (Annex 2-Figure 1).

4.1.2. Marketing and Foreign Trade

During the COVID-19 period, farmers and seasonal agricultural workers were required to obtain permits to travel from one province to another. Applications for these permits caused congestion at the provincial/district directorates of MoAF. This congestion was out of keeping with pandemic rules. As a result of the timely measures taken in the delivery of agricultural and food products to the market, there were no disruptions to the distribution of goods between actors in the food chain. The products were delivered to consumers on time thanks to the permissions issued to logistics companies that provide transportation for food and agricultural products. However, due to the 14-day quarantine requirement for trucks/truck drivers coming from abroad as part of the measures taken at the beginning of the COVID-19 pandemic, the costs of importing some products (such as watermelons) increased, and imports fell. For this reason, the prices of these products were high in the domestic market at the beginning of the pandemic period. A similar situation was experienced in exports: for example, an additional cost of TRY 0.35 per kg was incurred in exporting lemons.

People working in agricultural activities were exempted from some of the measures taken after the first



COVID-19 case in Turkey, such as curfew restrictions. During the interviews, it was found that although some problems were experienced in some regions during a very short initial period (5-10 days), there were no major problems in general. However, the situation was different at sales points. Interviewees stated that the curfew restrictions applied especially on weekends and holidays, and that markets closures significantly affected the fresh product wholesale markets. Consequently, the product prices fluctuated sharply within the same week. Due to the curfew restrictions on the weekend, brokers and traders sent products to the fresh wholesale markets during the early days of the week. According to the interviewees, dealers in the fresh product wholesale markets did not buy products from the producers towards the end of the week, which led to serious problems in the case of fresh vegetables and fruits harvested near the end of the week. Product quality declined sharply as these products were stored for 1-2 days by the producer. This affected the prices.

Since exports from the Akşehir district of Konya had brought in a good income in previous years, leading to similar expectations for 2020, the number of spraying rounds was increased from one to four in order to ensure the quality of the product. This caused an increase in costs. Family farms that had established mushroom greenhouses in the Bozkır district of Konya (one of the IFAD-funded projects of MoAF: Goksu-Taseli Watershed Development Project [GTWDP]) stated that they did not have air conditioning and that COVID-19 caused delays in the construction of greenhouses.

Summary of impacts on crop production

- (a) The measures taken by the government have prevented potential disruptions to the input supply, production, harvest, transportation, distribution, and sales stages of the agri-food chain, and no problems have yet occurred in the flow of food to the marketplace.
- (b) Farmers and other related actors in the agri-food chain did not experience major problems in cultivation (plowing, planting, combating diseases and pests, fertilization, harvesting).
- (c) There were generally no problems in the production phase, but marketing problems occurred in some product groups such as fresh vegetables. Due to the closures of restaurants, hotels and schools, and the weekend curfews, perishable products such as lettuces were affected, in some cases expiring after waiting in warehouses for longer than two days.
- (d) The most significant area of impact during the outbreak period is considered to be economic.
- (e) Prices for some product groups such as grains, pulses and oil crops increased while prices for others, such as tuber crops and fresh vegetables, declined in the March-July period. Input prices increased in the same period.
- (f) Crop production activities are perceived as a production-oriented tool aimed at ensuring food security and increasing food exports. Consequently, the social implications and environmental protection issues were not sufficiently considered or valued during the pandemic.
- (g) New information and communication technologies are used only by certain stakeholder groups involved in crop production activities. Those with a high level of institutionalization use more technology. At the farmer level, the numbers of users of internet banking services, smart phones and online group sharing applications had increased, albeit slightly.
- (h) Public institutions have a wide-ranging capacity for action for the timely mitigation of impacts in times of crisis when well-organized.
- (i) Since fruit demand has increased, fruit in cold storage was sold earlier than in previous years. Demand for the use of cold storage facilities has also increased.
- (j) The closure of kebab shops and restaurants reduced sales of fresh vegetables and onions.
- (k) Due to the measures on the export of onions and the closure of hotels and restaurants, there has been a significant decrease in demand for onions.
- (l) The lower number of visitors and tourists resulted in a reduced demand for agricultural products, especially in district markets.

4.2. Impacts on Livestock Production

Livestock production is an important part of Turkey's agricultural sector and economy. Livestock products, including meat, milk, eggs, wool, and hides, contribute almost half of the value of agricultural output. Turkey produces approximately 1.2 million tons of beef and mutton, 2 million tons of poultry meat, 23 million tons of milk, 20 billion eggs and 110,000 tons of honey annually (TURKSTAT, 2020). Livestock production is an important activity especially for small family farms, meeting the animal protein needs of their family and mitigating risks to their farm income. Thus, animal husbandry is found in all regions of Turkey, but is more widespread in some regions. There are also regional differences, as in crop production. For example, dairy farming, stockbreeding, sheep and goat farming, poultry and egg production are concentrated in some regions.

Because there are many different species in the livestock sector in Turkey, there are many different production systems, varying in terms of products, intensity and methods. Environmental factors also determine the intensity of production in different locations. Despite the significant differences in production systems, there are also similarities in key respects.

COVID-19 has affected the livestock production chain by infecting workers, disrupting the supply chain and impacting demand adversely.

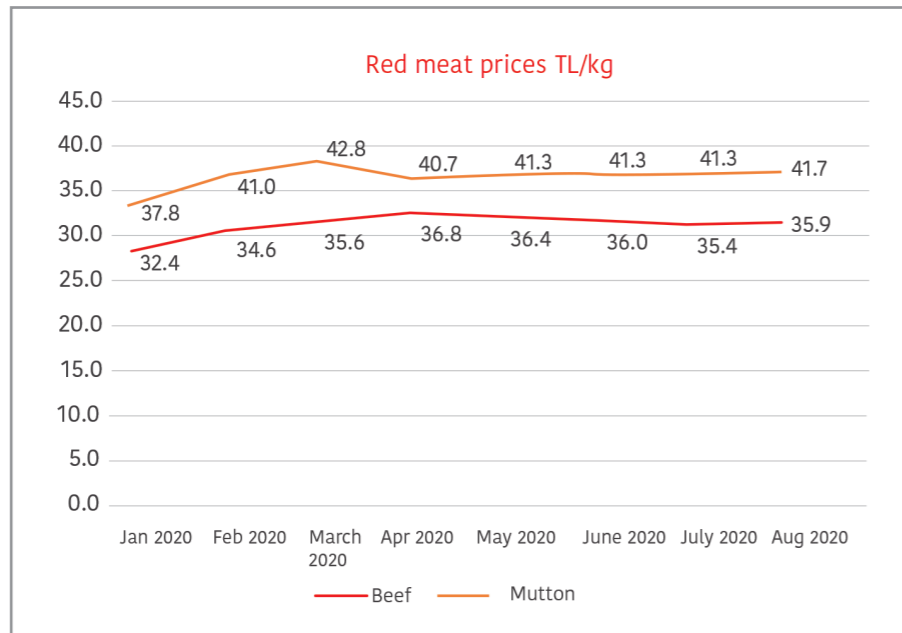
4.2.1. Meat Production

The meat sector has been negatively affected by COVID-19 market disruptions all over the world, aggravated by the effects of animal diseases. The COVID-19-related economic hardships, logistical bottlenecks and a steep decline in demand from the food services sector due to lockdowns have led to a global slump in import demand, causing international meat prices to fall. The sharpest drop was registered for ovine meat, followed by poultry and bovine meats. Plummeting food service sales have resulted in meat stock accumulation, especially in the premium categories, and in bulk packaging to extend export availability and price setting on international markets, despite a decline in meat output caused by labor shortages in slaughterhouses, processing and packing due to the pandemic (FAO, 2020).

Beef accounts for the largest share of red meat production in Turkey. It is followed by mutton, goat and buffalo meat production. Seasonal dependence in the production of beef and buffalo meat is lower than mutton and goat meat production. In other words, although it varies by region, there is generally a seasonal production pattern in mutton and goat meat production. March, when the first COVID-19 cases emerged in Turkey, is also the month when the lamb and goat meat market season starts in some regions. March, April and May are the months when ovine meat production is at its most intensive. During these months, the COVID-19 measures led to the closure of hotels and restaurants, bans on picnics, meetings and similar events as well as weekend curfews. There was a decrease in the demand for lamb and goat meat. Similar conditions applied to beef, but due to the higher home consumption of beef, it was relatively less affected. Producer prices were said to have decreased by 15-25% for mutton and goat meat and 10-15% for beef, with regional variations. Price data compiled from the bulletins published by the National Red Meat Council show that consumer prices for mutton declined by 3% in April over the previous month and increased by 3% in May (Figure 11). These trends may explain the decrease in income levels reported by the stakeholders in animal production, and the decline in the number of buyers.

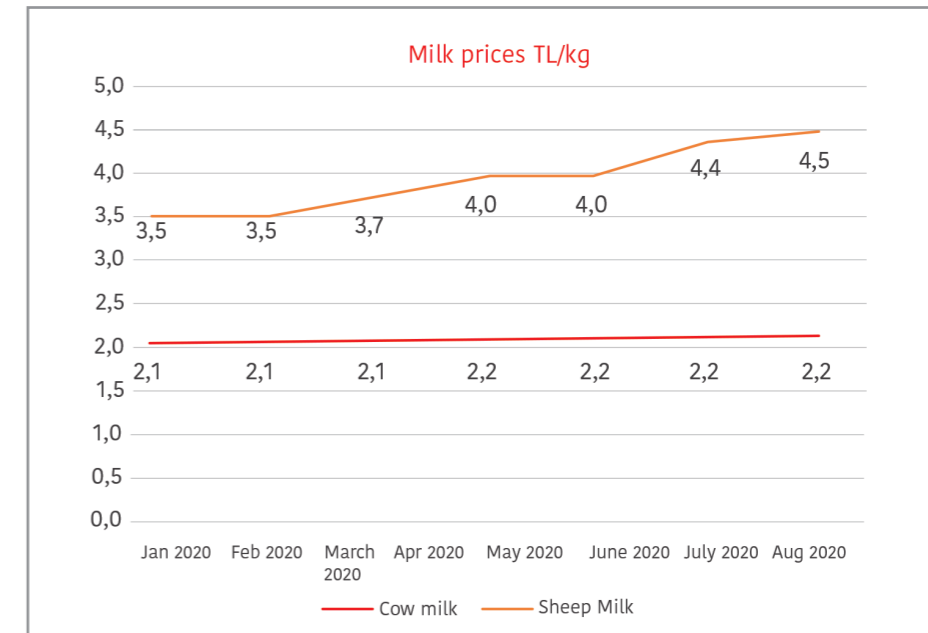


Figure 11. Red meat prices in Turkey



Source: (TURKSTAT, 2020)

Figure 12. Milk prices in Turkey



4.2.2. Milk and Dairy Products

In Turkey, milk production is more fragile than other types of animal production. Although most of the milk produced is industrially processed, a significant amount is still sold as unregistered (street) milk. Changes in consumers' eating habits during the COVID-19 period affected their consumption of milk and dairy products. A decrease was observed in the amount of industrially processed milk consumed during this period while there was an increase in the demand for raw milk and street milk produced by disease-free enterprises. Although there are multiple reasons for this, the fact that consumers spent more time at home and tended to prefer fresh milk for their home consumption played a huge role in the shift in demand. Another important factor was that many large buyers such as schools, canteens, restaurants and patisseries were closed. Consumers preferred to consume home-made products (such as home-fermented yoghurt) in the belief that they are healthier than packaged products sold in shops. This is the reason given for the significant decrease in packaged yoghurt sales. There was an increase in the prices of sheep's milk while cow's milk prices remained the same (Figure 12). This could be the main reason for the increase in the income levels of stakeholders operating in milk production.

4.2.3. Poultry Production

A significant proportion of the firms producing poultry meat in Turkey have a large capacity and an integrated infrastructure. These firms produce not only chicken meat but also processed, semi-processed and ready-to-eat products. While these products may be consumed directly at home, processed products especially are delivered to consumers at collective consumption points such as hotels and restaurants. The temporary closure of these mass consumption points due to COVID-19 measures resulted in a decrease in sales. Although household consumption is said to have increased in this period, total sales were lower than the previous year. The fall in sales was reported to have led the firms in the sector to operate at lower capacities.

Eggs are generally consumed in households and in many areas of the food industry. They cannot be stored for a long time. In the outbreak period, the closure of foreign markets resulted in eggs being marketed on the domestic market only, although exports had been high in previous years. In this period, domestic demand increased, especially due to the closure of schools, the rotating work shifts for public sector personnel, and the remote or rotational employment of private sector personnel. However, the increase in in-house demand was not enough to utilize the whole supply. The closures in the service sector (hotels, restaurants, patisseries, etc.), where eggs are used extensively, reduced the demand for eggs. The inability to export caused excess supply in the market and lower prices. Furthermore, increases in input prices during this period prevented producers from maintaining their incomes.



4.2.4. Honey Production



Photo: Erkan Pehlivan, Özdal Köksal

Honey has a special importance among products of animal origin due to its positive effects on the immune system. Its consumption may be expected to increase especially in times of sickness. Indeed, it was stated during the interviews that demand for honey had increased significantly during the outbreak in Turkey. In April and May, particularly, honey packaging companies were reported to have switched to a double-shift or even three-shift production system. This increase in consumer demand also caused honey prices to rise. However, the significant increase in honey sales in April and May gave way to stagnation from June onwards. This was attributed to the stocks built up by consumers in the

earlier period. However, packaging companies stated that they had achieved the same sales volume as for the whole of last year in the first six months of 2020 alone. It was also reported that, during the months of intensive sales, the demand from chain vendors operating at the national level could not be met. According to the interviews, no problems occurred in honey production due to COVID-19. In general, there has been an average increase of 25% in honey prices this year. This has led to an increase in the incomes of the stakeholders concerned.

4.2.5. Livestock Supply Chain

While the impacts of the pandemic on food chains are still unfolding, several policy lessons have already emerged. Open and predictable markets have been critical for the smooth distribution of the food along supply chains and for ensuring that it can move to where it is needed. Diversified supply sources have allowed firms along the food chain to adapt rapidly when specific input sources were compromised by disruptions in logistics. Finally, meeting the needs of vulnerable groups requires attention to food access, such as by ensuring targeted, flexible safety nets.

Some impacts of COVID-19 on the livestock supply chain are summarized in Box-1, together with the policy options followed by different stakeholders in various countries. The flow of data in Turkey has not been subjected to similar analyses, preventing researchers in Turkey from monitoring and evaluating the precise impacts on the livestock sector.

Box-1. The impact of COVID-19 on the livestock supply chain

The impact of COVID-19 on the livestock supply chain		
PRODUCTION	IMPACT	<p>The enforced closure of non-essential businesses, travel restrictions and border controls may:</p> <ul style="list-style-type: none"> • Hinder farmers from accessing farming inputs, supplies and equipment, such as feed, replacement stocks (chicks, pullets, lambs, calves), breeding materials, milking machines and repair services; • Cause a temporary labor shortage; • Result in animal and animal product loss and waste
	EXAMPLES	<ul style="list-style-type: none"> • Some Chinese, American, etc. poultry farmers destroyed chicks, chickens and ducks to avoid further losses • Pig farmers in the United States of America and Canada have culled or aborted their herds as they have not been able to sell and ship their animals due to closure of processing facilities. Farmers in Wisconsin, USA were asked to dump 25,000 gallons of raw milk a day because there was no market for it.
PROCESSING AND DISTRIBUTION	IMPACT	<ul style="list-style-type: none"> • Delivery failure of animals and animal products causes overstocking or waste. • Restricting animal movement can cause overcrowding and overuse of natural resources such as water and grazing land. • Reduced slaughtering and processing capacity can limit meat output; notably for labor-intensive slaughterhouses and food processing plants. • Product distributors lose their routine customers such as schools, local markets, restaurants, public events and the travel industry.
	EXAMPLES	<ul style="list-style-type: none"> • Trucking companies that transport dairy and meat products are struggling to get enough drivers as some have stopped working due to fear of contagion. • In the USA and Canada, there is rising concern regarding a labor shortage in meat processing plants and farms, with lockdowns and/or suspension of foreign visas (Dairy Global, 2020). • About 10% of beef production and 25% of pork production in the USA has been shut down due to COVID-19 outbreaks among staff. • In several countries, some food producers have lost its routine market due to the closure of school canteens, restaurants, etc. (InEuropa Srl., 2020).
PROCESSING AND DISTRIBUTION	IMPACT	<ul style="list-style-type: none"> • Closure of local markets limits the ability of many smallholder farmers and suppliers to sell their products. • The insufficient information and misconception regarding livestock or livestock products being hosts or vectors of the virus cause further decline in demand for meat and other animal products. • Import and export restrictions and reductions.
	EXAMPLES	<ul style="list-style-type: none"> • FAO's Food Price Index decreased by 4.3% between February and April, largely driven by changes in demand (Frieden, 2020) (Global Alliance for Improved Nutrition-GAIN, 2020). • The World Bank estimates that agricultural production could potentially decrease between 2.6 % and 7 % because of trade blockages. Food imports could decline substantially, between 13% and 25%, due to a combination of higher transaction costs and reduced domestic demand (WB., 2020).



4.2.6. Animal Disease Prevention and Control

COVID-19 directly or indirectly disrupts activities to keep livestock healthy, including the prevention and control of animal diseases. Some examples are shown below in Box-2.

Box-2. The impact of COVID-19 on animal health

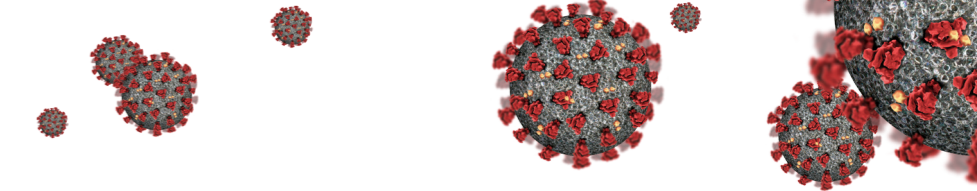
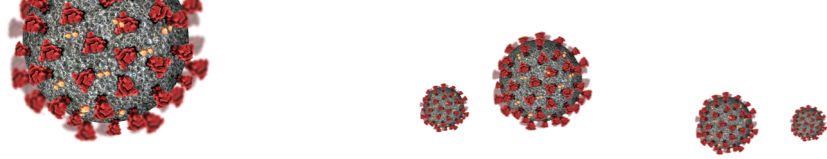
The impact of COVID-19 on animal health	
FARM activities and National Animal health activities	<p>IMPACT</p> <p>Due to labor shortages, there is reduced capacity to work on animal health activities such as maintaining good biosecurity, vaccination and the medical treatment of sick animals.</p> <ul style="list-style-type: none"> • The overstocking of animals at farms could increase stress and the prevalence of animal diseases, and compromise animal welfare standards. • Farmers and / or producers can be affected by COVID-19 and cannot continue their normal work routine. • Movement restrictions and quarantine measures limit farmers' ability to access basic veterinary services and pose challenges for veterinary and animal health technicians when visiting farms. • The impact on logistics and supply chains affects farmers' access to animal health inputs, such as veterinary drugs, vaccines, disinfectants and supplies.
	<p>EXAMPLES</p> <p>AS six of the 32 animal drug companies in China suspended drugs and pharmaceutical ingredients production for the US market, the FDA indicates that supply chain disruptions could be led to shortages (AVMA, 2020).</p> <p>Australia's Minister of Agriculture said that current COVID-19 restrictions would affect the way industry and government respond to animal disease outbreaks such as African swine fever and etc. regarding the early detection and reporting (Phelps, 2020).</p>

LABORATORY; veterinary diagnostics and disease surveillance and reporting	<p>IMPACT</p> <p>Reduced testing, diagnostic and research capacities</p> <ul style="list-style-type: none"> • Lockdowns and the closure of some veterinary laboratories and institutions restrict the animal disease testing and research. • Shortage of diagnostic kits and reagents restrict the ability to test for animal diseases. <p>Disrupted animal disease surveillance and reporting</p> <ul style="list-style-type: none"> • National vaccination campaigns cannot be implemented as planned. • National animal disease control programs may be reduced or even suspended. • Disease surveillance activities including investigation and disease reporting may be disrupted due to logistical issues and restrictions.
	<p>EXAMPLES</p> <ul style="list-style-type: none"> • Increased demand for COVID-19 testing has caused shortages of chemicals for extracting RNA, polymerase enzymes, specimen collection swabs, and PCR machines (Slabodkin, 2020) (Herper, M and Branswell, H, 2020). • Limited or restricted access to PPE has been reported in most countries (WHO, 3 March 2020), making it more difficult to safely perform outbreak investigations and responses. This is a particular issue for animal diseases that are easily transmitted through fomites or that present occupational risks.
International animal health activities	<p>IMPACT</p> <ul style="list-style-type: none"> • Responses to the outbreak of transboundary animal diseases may be late or insufficient. • Member countries and donors may switch priorities to manage the most relevant issues due to COVID-19, reducing funding and/or logistical support for other projects. • FAO, OIE and other international organizations' global, regional and national animal health programs and efforts might be delayed. • Bi & multilateral animal health projects and activities cannot be implemented as planned.
	<p>EXAMPLES</p> <ul style="list-style-type: none"> • The project deliveries of FAO, OIE and other international institutions have been compromised and discussions with donors and veterinary services are ongoing to modify plans and deliver activities. • The planned FAO conference: "African swine fever unprecedented global threat: a challenge to food security, wildlife management and conservation" has been postponed (FAO, 2020). • World Dairy Expo has been cancelled for the first time in its 53-year history, due to the coronavirus. The expo was set to take place at the Alliant Energy Center in Madison, Wisconsin, 29 September to 3 October 2020. • The world's largest international animal production show EuroTier that takes place in Germany was postponed to February 2021 due to COVID-19. Originally the show was planned to take place 17-20 November of this year.

4.2.7 Veterinary Medicine and Healthcare Sector

This is a sector that could be seriously impacted by the pandemic. The sector has problems with importing medicines such as antiparasitic drugs, which are important for cattle, and antibiotics for ruminants and poultry.





For example, the Brazilian National Union of the Industry for Animal Health Products has warned that producers might be dealing with a lack of veterinary medicines in the second half of this year, despite the fact that they have been operating normally during the first few months of the pandemic. A survey of the Union's members in June found 52.2% of them reporting difficulties in importing active ingredients during the pandemic. They also expect prices to rise in the upcoming months because a high proportion of the active ingredients are imported. In any case, quarantining has affected sales and will have a negative impact on targets for 2020. 78.3% of the executives interviewed stated their companies would not reach their goals for 2020. The research also highlighted reduced contact with customers (56.5%) and lower employee motivation due to uncertainty (47.8%) as challenges. Despite these results, sentiment in the sector is still somewhat optimistic. Although 52.2% are neither optimistic nor pessimistic about the status quo, 26.1% say they are optimistic, whereas 21.7% are pessimistic. Regarding the future, 39.1% expect to emerge stronger from the crisis.

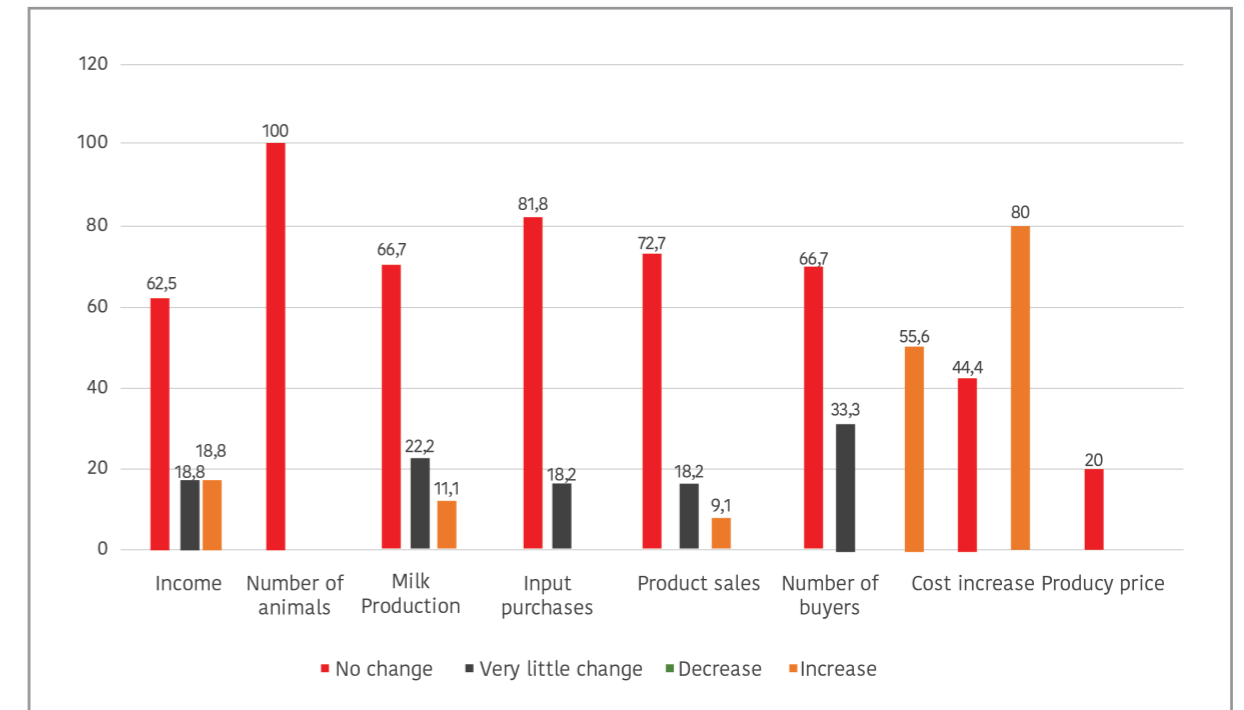
The COVID-19 pandemic has brought much uncertainty to many sectors. One cause for concern is whether distributors will still be able to supply dairy farmers with hygiene products. Chlorine is a biocide of choice for dairy hygiene, but it has now been approved by WHO for coronavirus control. Therefore, demand for chlorine has expanded into non-traditional markets (Dairy Global, 2020).

When coronavirus hit and countries all over the world began going into lockdown, there was an unprecedented increase in demand for hygiene solutions for food and beverage production and for the healthcare and hygiene sectors. The demand for hygiene solutions skyrocketed in many sectors on a global scale. From now on, every sector will be paying greater attention to hygiene. As a result, demand and buying patterns will change, and disinfectants in particular will see a continued increase in demand. This indicates that hygiene is of the utmost importance in agriculture. The market imbalance, unexpected fluctuations in currency exchange rates and extra logistical expenses will affect the prices of medicines. This scenario will force the prices of veterinary medicines to realign at the end of the year.

4.2.8 Other Areas in the Livestock Sector

According to the findings of the survey, the most important impact of COVID-19 on the livestock sector was cost increases. 45% of the stakeholders questioned stated that their production costs had increased. The increase in costs was reflected in product prices to some extent, and sales declined. The proportion of interviewees who said that their product prices had increased was 20%, while 9% stated that their product sales had fallen. While 63% of the stakeholders stated that there was no change in their income, 19% stated that it declined and 19% that it increased (Figure 13).

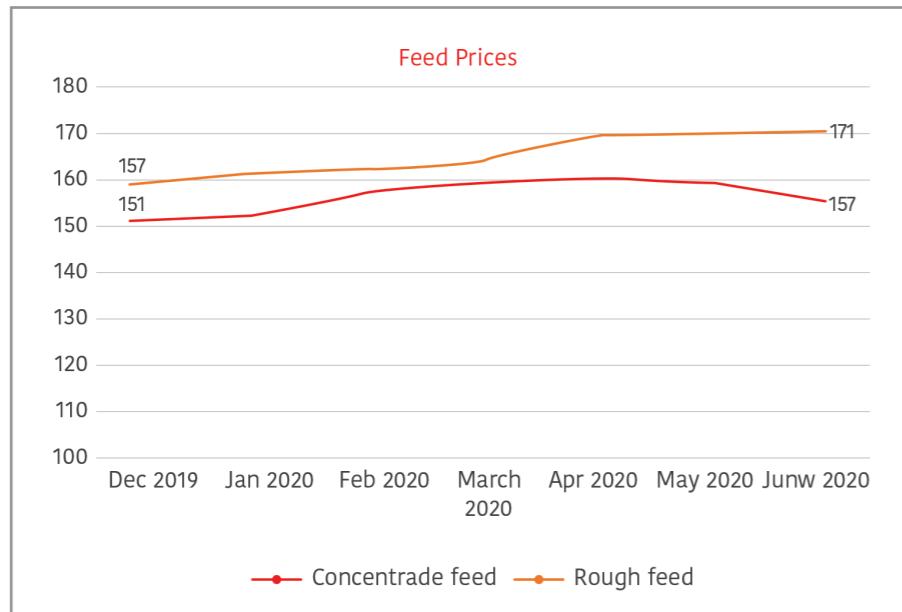
Figure 13. Animal production: Changes in economic parameters (%)



Feed is one of the most important production inputs in the livestock sector. According to production cost studies, over 70% of production costs in livestock production consist of feed costs. The interviews touched on the effect of COVID-19 on feed prices in the livestock sector. There was an average increase of 25-40% in feed prices, varying by feed type and region. However, it was also reported that the increase was caused by macroeconomic developments such as the depreciation of the lira and the closure of customs points. According to TURKSTAT data, the increase in feed prices was lower than the study findings suggest (See Figure 14). The increase in input prices caused an increase in the costs of livestock enterprises. There are two important subsectors in agriculture in which Turkey's agricultural production is not self-sufficient: oilseeds and fodder for livestock.

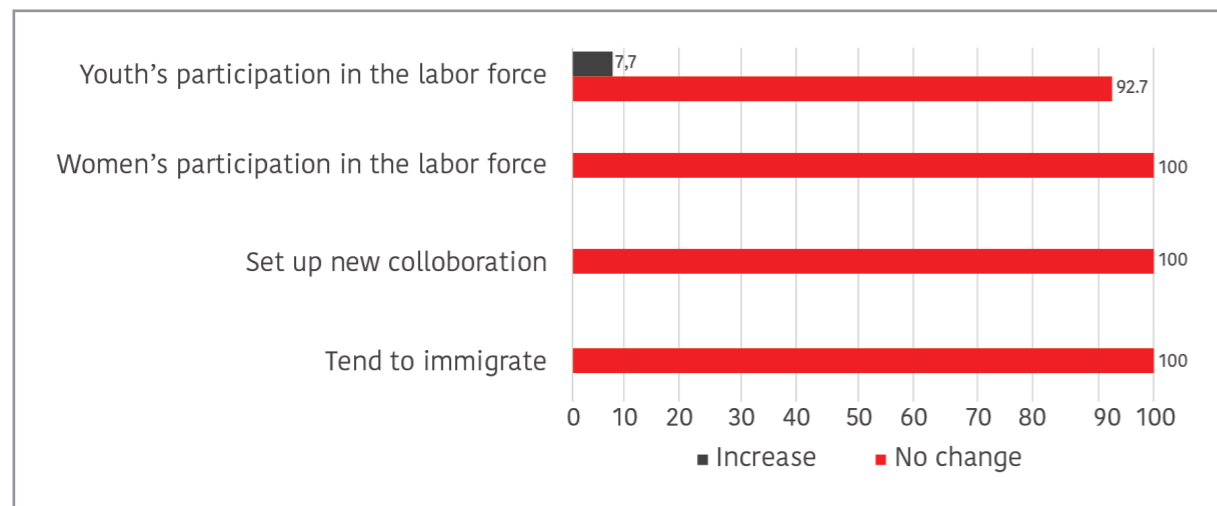


Figure 14. Feed prices in Turkey (TRY/ton)



Regarding the social impacts of the pandemic, no major changes were observed in the livestock sector except for the increased participation of young population in the labor force. As in crop production, it was found that young people took part in livestock activities in small family farms with their families because high schools and universities were closed (Figure 15).

Figure 15. Animal production: Changes in social parameters (%)



In addition, a significant portion of the staff working in livestock farms as animal keepers/shepherds are workers of foreign origin (Syrians, Afghans, Uzbeks, etc.). Although there are many reasons for this, the most important were said to be the difficulty of employing Turkish citizens and their higher wage demands. There has been a significant increase in the number of foreign workers in recent years. However, closure of the borders during COVID-19 period prevented the arrival of foreign workers in Turkey and businesses experienced difficulty in finding foreign workers for their operations. Therefore, workers' wages increased

in the domestic market. Thus, Afghan shepherds (or animal keepers) working in the provinces of Ankara and Konya provinces were unable to return to their places of work due to closed border gates and inter-city travel restrictions. It was reported that the contraction in the labor supply in the livestock sector caused the monthly salaries of animal keepers/shepherds to rise from TRY 1,800 to TRY 2,500.

The stakeholders engaged in animal production activities were found to be sensitive about health protection and care (Figure 16). Almost all the stakeholders said they complied with rules for personal hygiene, use of masks and physical distancing. Regarding in-house and environmental cleaning concerns, it was found that larger-scale institutional stakeholders were more sensitive about internal and general environmental cleanliness.

Figure 16. Animal production: Changes in health parameters (%)

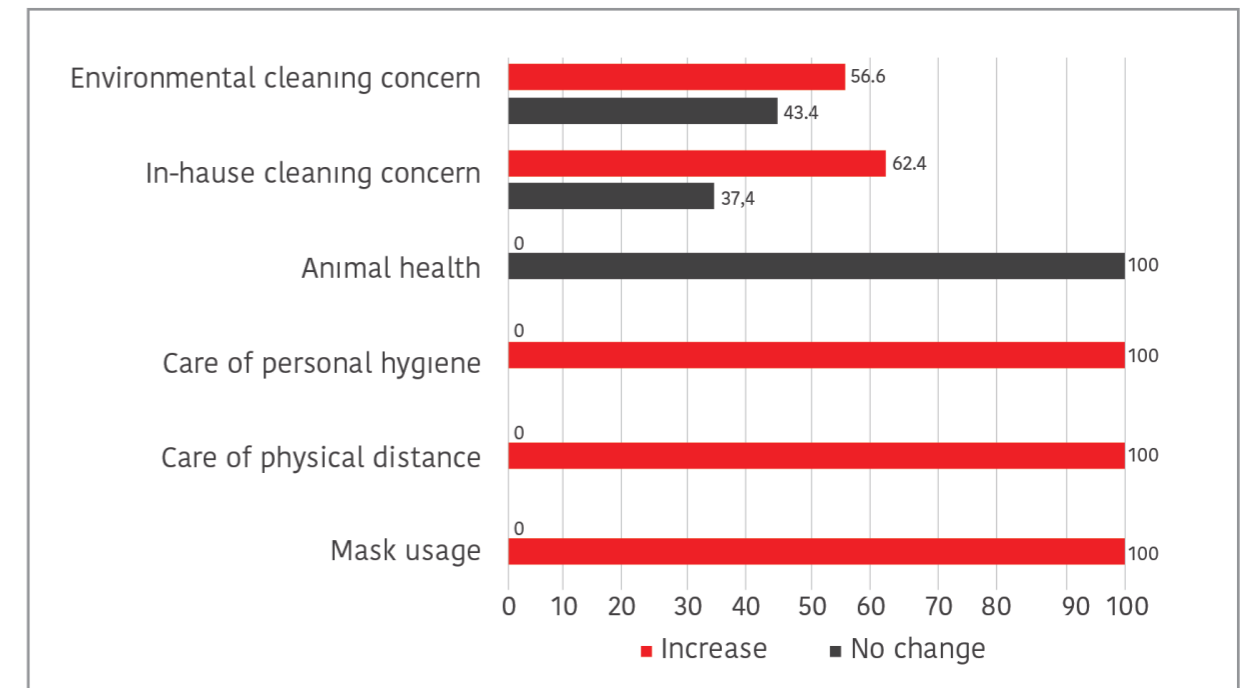
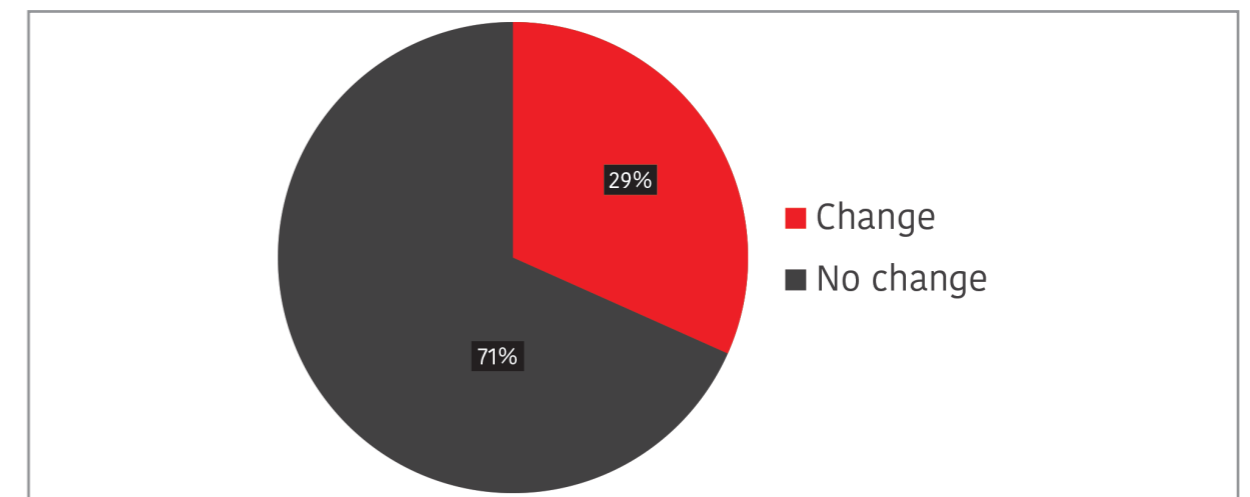
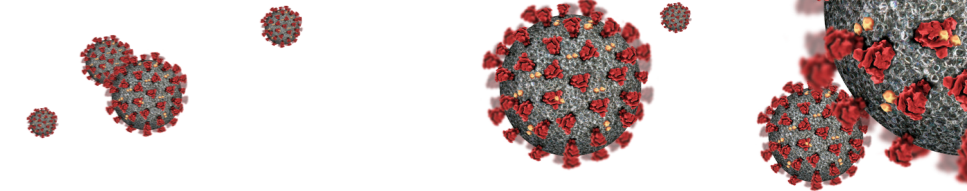
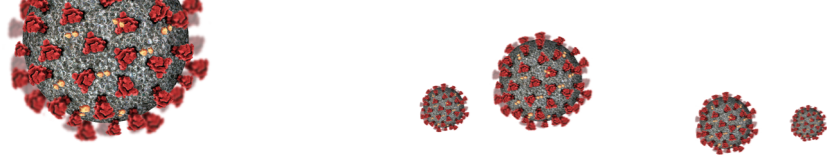


Figure 17. Animal Production: Use of new technologies





COVID-19, was observed to lead to the use of new knowledge and new technologies in animal production activities, especially by stakeholders in the processing and marketing stages (Figure 17).

Stakeholders stated that COVID-19 did not cause any environmental changes.

When the stakeholders involved in livestock production were asked to evaluate the COVID-19 situation in general in terms of its economic, health, social and environmental impacts and its effect on the use of new technology, they stated that the most significant impacts for animal production in the future would be health-related (0.622) and economic (0.612). These two criteria can be said to carry much the same weight for producers of animal products. Among the other potential impact areas, social impacts and the use of technology came next, while environmental impacts were ranked last (Annex 2, Figure 2).

Summary of the livestock sector

- (a) There are currently no disruptions in the input supply, production, transportation, distribution, logistics and sales stages of the agri-food chain in the livestock sector. In general, thanks to the measures taken by the government, no problems occurred in the flow of food of animal origin to the markets. Milk and meat processing are labor-intensive operations by nature and these sectors appear to be more sensitive than other types of food processing. In confined spaces such as packing plants for milk or meat processing facilities, necessary social distancing measures have reduced the efficiency of operations and there is a need to ensure the adequate protection of employees.
- (b) There were generally no problems in the production phase, but marketing problems occurred in some product groups such as fresh milk. Due to the weekend curfew, it was not possible to sell milk at the farm gate or in local markets. More milk was therefore processed as yogurt or cheese, which led to an increase in stocks.
- (c) A decrease was observed in the milk and dairy product sales of local dairy plants as demand from schools, canteens and patisseries came almost to a halt.
- (d) Input prices, mainly feed prices, increased during the COVID-19 period, but milk and meat prices did not increase in proportion to input prices.
- (e) The closure of mass consumption points led to a decline in poultry production and sales.
- (f) As hotels, schools and restaurants were closed, and activities such as picnics and outdoor meetings were banned, the demand for lamb and goat meat shrunk and sheep and goat producers were adversely affected.
- (g) Demand for honey increased during the pandemic period, and no problems occurred in the honey sector.
- (h) Farmers and other related actors in the agri-food chain did not experience any major problem in husbandry (feeding, grazing etc. of livestock).
- (i) All stakeholders agreed that health issues posed the greatest risk factor to the future of the livestock production sector. They observed that biosecurity measures were being implemented intensively in companies producing animal feed, milk and honey.

4.3. Impacts on Fisheries and Aquaculture

The impacts of COVID-19 on the fisheries and aquaculture systems vary, and the situation is rapidly evolving. Fish and fish products are a key component of a healthy diet and are safe to eat. Misleading perceptions in some countries have led to a decrease in the consumption of these products. Yet, the coronavirus cannot infect aquatic animals (finfish, reptiles, amphibians and invertebrates such as crustaceans and mollusks), therefore these animals do not play an epidemiological role in spreading COVID-19 to humans.



Photo: Erkan Pehlivan, Özdal Köksal

While there is no evidence of viruses that cause respiratory illnesses being transmitted via food or food packaging, fishery and aquaculture products can become contaminated if handled by people who are infected with COVID-19 and who do not follow good hygiene practices. For this reason, as before COVID-19, it is important to emphasize the need to implement robust hygiene practices to protect fishery and aquaculture products from contamination.

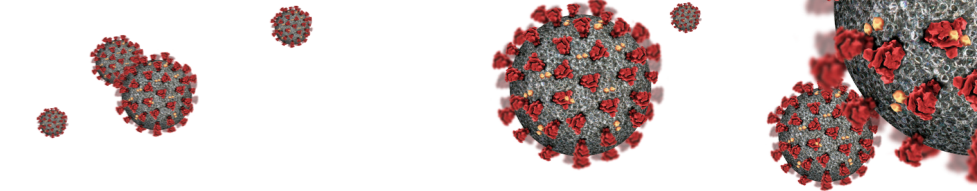
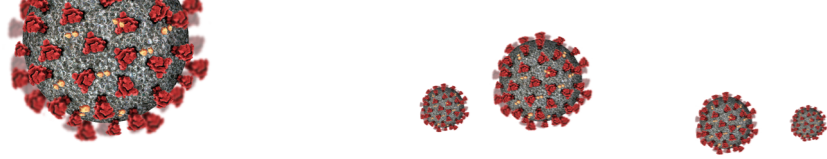
Fish and fish products that are highly dependent on international trade suffered quite early in the development of the pandemic from the restrictions and closures of global markets, whereas fresh fish and shellfish supply chains were severely impacted by the closure of the food service sectors – i.e., hotels, restaurants and catering facilities, including school and work canteens. The processing sector also faced closures due to reduced and/or lost consumer demand. This had a significant impact, especially on women, who form the majority of the workforce in processing.

In Turkey, the fishing season at sea (trawling and purse seine fishing) takes place between 15 September and 15 April. Trawling continued in Turkey in March. Because of the COVID-19 measures in March, the closure of places with high fish consumption such as hotels and restaurants caused difficulties in the marketing of the catch and fish prices decreased sharply. Consequently, the incomes of the people working in the sector decreased significantly. On the other hand, it was reported that some large companies and restaurants purchased fish on sale at low prices and put them in cold storage. Overall, stakeholders stated that trade in the sector was affected significantly due to COVID-19 and that the entrepreneurs in the sector will work harder in the next fishing season in order to compensate for their economic losses, which may increase the pressure of fishing in the Mediterranean further. To compensate for the difficulties of fishermen, MoAF postponed the rental payments of fishers who rented fishing rights and the fishing shelters due to the fishing and marketing activities have been limited at the start of the Pandemic.

No major problems were experienced in fish farming (aquaculture). The suspension of exports caused the fish produced to be directed to the domestic market and cold storage until exports were resumed. Furthermore, the MoAF organized two rounds of a discounted aquaculture fish sales campaign through chain stores in April, in support of domestic consumption. Producers who supplied their aquaculture products to the chain stores were supported.

The most important issue identified by the fishery production cooperatives was that most of the cold storage capacity was taken up in the crisis period. It was also found that some of the actors in the chain developed individual measures of their own to prevent the COVID-19 measures from causing disruption in the food chain. For example, when exports resumed, logistics companies using road transport began to change drivers at the borders. Thus, the 14-day quarantine obligation for drivers entering the country from abroad was circumvented and the deterioration of the products was prevented.





Summary of the Fisheries and Aquaculture Sector

(a) There are currently no disruptions in the input supply, production, transportation, distribution, logistics and sales stages of the fisheries and aquaculture chain and generally no problem occurred in the flow of food to the markets.

(b) The sea fishing season was under way during the beginning of COVID-19. Sea catches were put in cold storages due to the closure of restaurants and export bans. The number and capacity of cold storage facilities need to be sufficient for such eventualities.

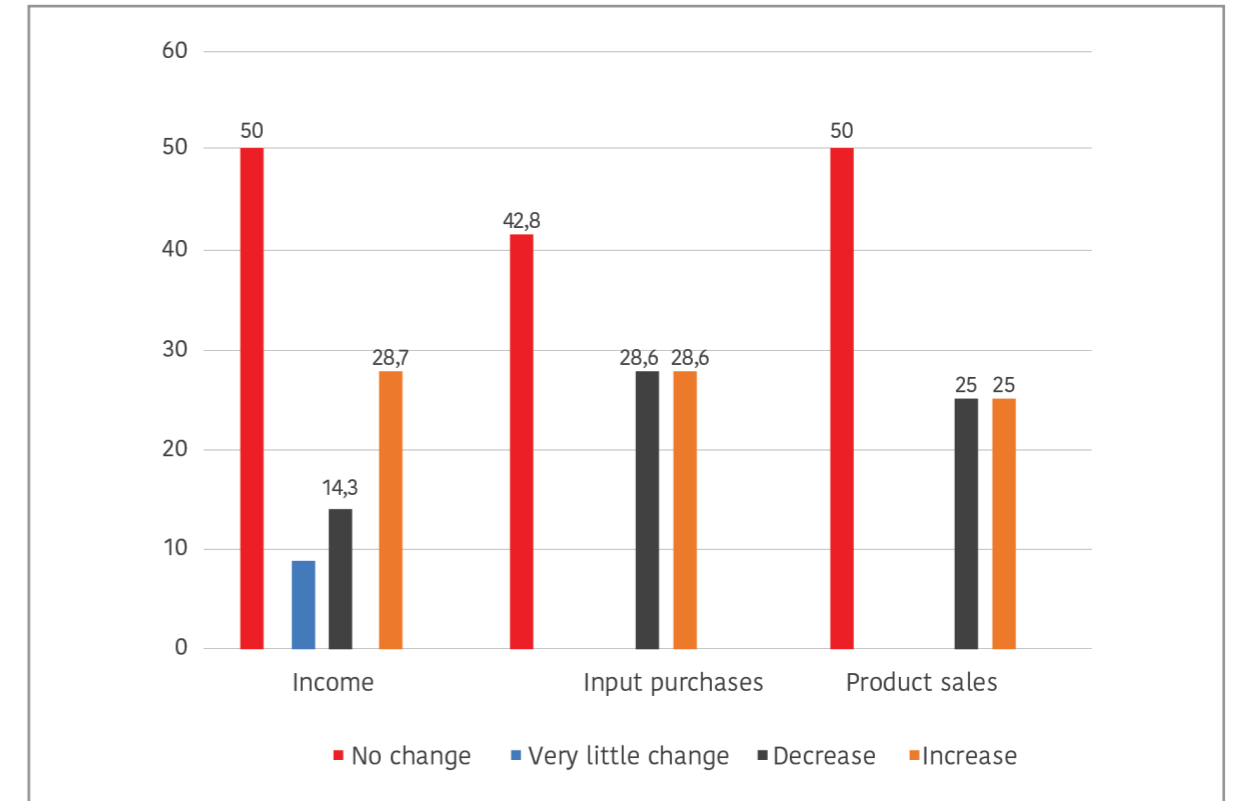
4.4. Impacts on the Food Industry

COVID-19 led to reduced productivity in food processing and distribution facilities. It also led to the temporary closure of some factories due to outbreaks of illness and the time needed to implement the measures necessary for re-opening. The impact of COVID-19 on the food industry varied significantly by sub-sector. For example, processors and packers of pasta, dairy products, honey and dry pulses continued to produce very intensely during COVID-19. Food processing facilities in these sub-sectors increased the number of shifts to two or even three. Slaughterhouses and meat processing plants had to close or work at lower capacity since working conditions were not suitable for the pandemic period. During the outbreak, there have been no shortages of red meat, poultry meat, milk, eggs or other products of animal origin in Turkey. This situation is among the reasons for the pattern of changes in incomes, input purchases and product sales shown in Figure 18.

On the other hand, some parts of the food industry contracted, with a corresponding decline in incomes, input use and product sales. The main reasons for this slowdown can be listed as follows:

- Food companies mainly supplying products to school canteens, hotels, restaurants, cafeterias and patisseries temporarily halted production,
- Globally operating fast-food chains closed some production units that provide further processed products,
- The closure of kebab shops and restaurants reduced the sales of fresh vegetables and onions by approximately 60%-80%,
- The low number of tourists, including Turkish citizens' resident abroad visiting their home towns, could not compensate for a decrease in demand for agricultural products, especially in district markets.

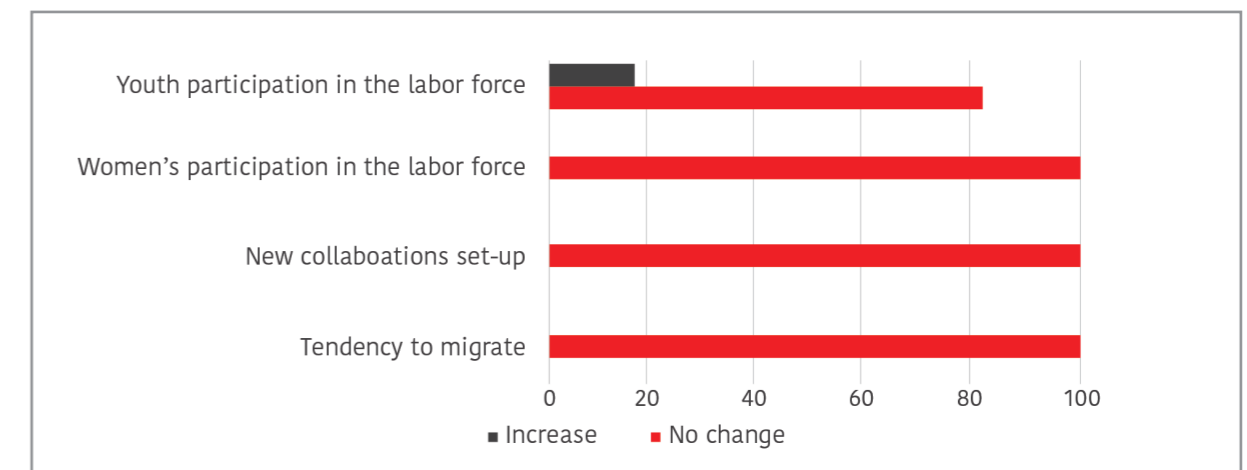
Figure 18. Food industry: Changes in economic parameters (%)

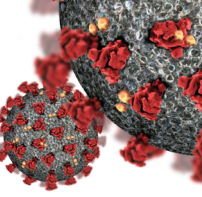
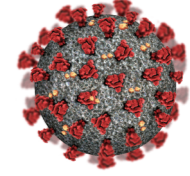
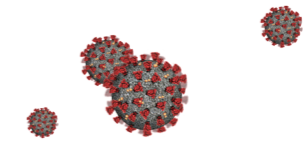
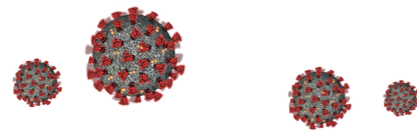
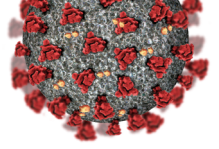


The Turkish government and MoAF are committed to the continuous output of livestock and crops and provided the necessary support to farmers. All agriculture, food and livestock companies are required to enforce strict protocols to identify shortcomings at their workplaces and the measures to be taken for staff under the guidance of the MoAF in order to control of the pandemic in farms, factories, slaughterhouses and similar places.

With respect to the social impacts of COVID-19 in the food processing sector, the stakeholders who took part in the survey were asked to evaluate the effects on employment, seasonal agricultural work, the participation of women and youth in employment, and the establishment of new collaborations. The results are shown in Figure 19.

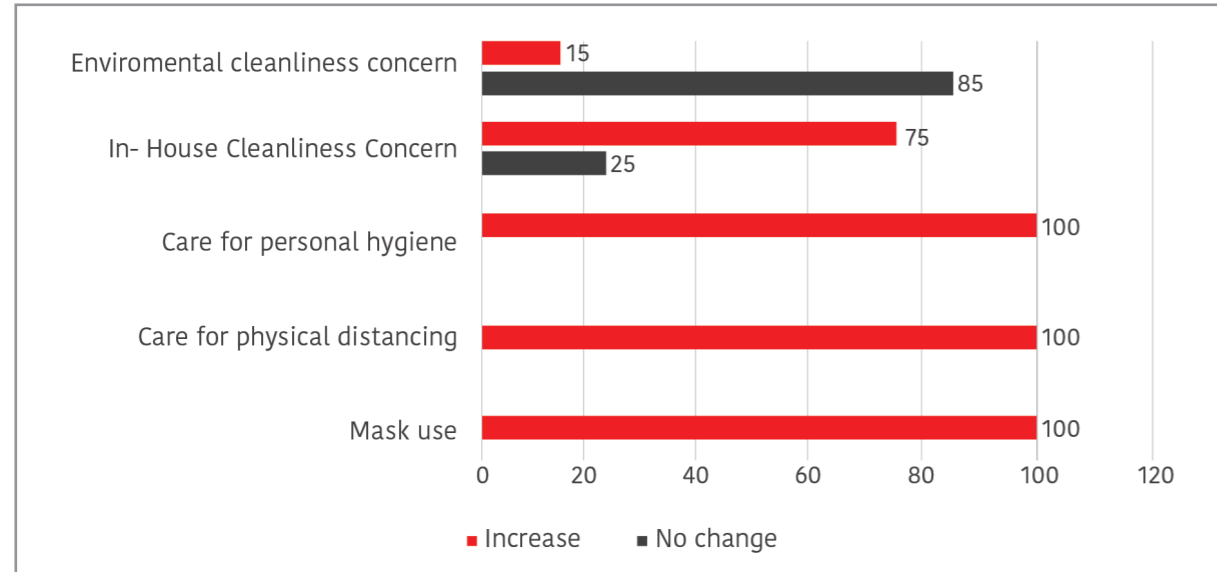
Figure 19. Food industry: Changes in social parameters (%)





As the Figure shows, there was no change in these social parameters in the food sector, except for the participation of the young population in the labor force. This change was mainly due to the increase in the demand for labor from exporters/brokers/ intermediaries in certain sub-sectors and from marketing chains that increased their sales volumes and worked additional shifts. This situation originated from the intensity of temporary work and affected temporary workers. The increase in the rural labor force was mainly the result of closures in services sectors and the shift of young people working in temporary jobs in the services sector to the food sector.

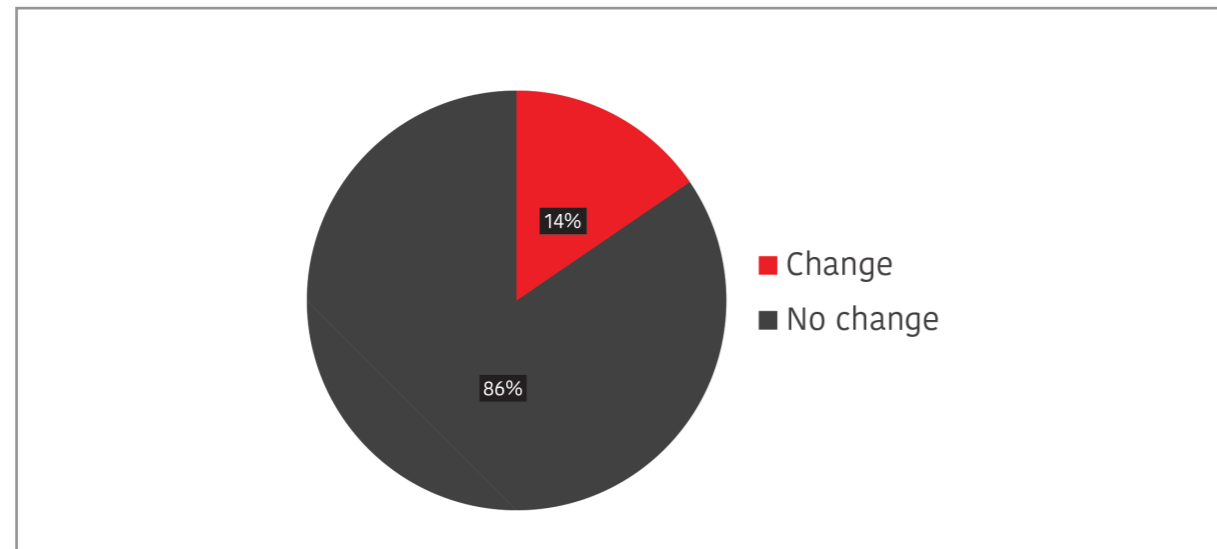
Figure 20. Food industry: Changes in health parameters (%)



The stakeholders in the food industry were seen to act sensitively with respect to health protection. Indeed, almost all stakeholders proved compliant in personal hygiene, use of masks and physical distancing.

COVID-19 was found not to have resulted in any changes for stakeholders in the food sector in terms of the environment.

Figure 21. Food industry: Use of new technologies



With respect to the use of new information and technology in the food industry, changes in sales and marketing strategies resulted in more frequent use of e-commerce as a remote marketing alternative, especially in the honey and dairy product groups (Figure 21).

When the stakeholders in the food industry were asked about the main areas of impact of COVID-19, the most significant impacts were found to be in the economic domain (0.646), followed by health (0.630). Social impacts took third place, and the positive impact on technology use came fourth. Environmental impacts place last. The interviewees may have been confused about environmental impacts as their concerns were more about economic impacts (Annex 2, Figure 3). Any environmental impact that damages harvests or productivity can easily be considered as a negative for agriculture, combined with the negative impacts of COVID-19 itself.

Summary of the food industry

- (a) The sectors producing pasta, dry pulses, milk processing and honey continued their production very intensively and increased the number of shifts to meet demand.
- (b) Youth participation in the labor force increased in particular sub-sectors, due to the increase in demand for labor from exporters/brokers/intermediaries in dry pulses, pasta, honey and in retail markets with the increase in the quantity of production and the number of shifts worked.
- (c) The use of new technology and e-commerce in the food industry increased due to changes in sales and marketing strategies, especially in the honey and dairy product groups.

4.5. Other Areas

4.5.1. Support for the agricultural sector

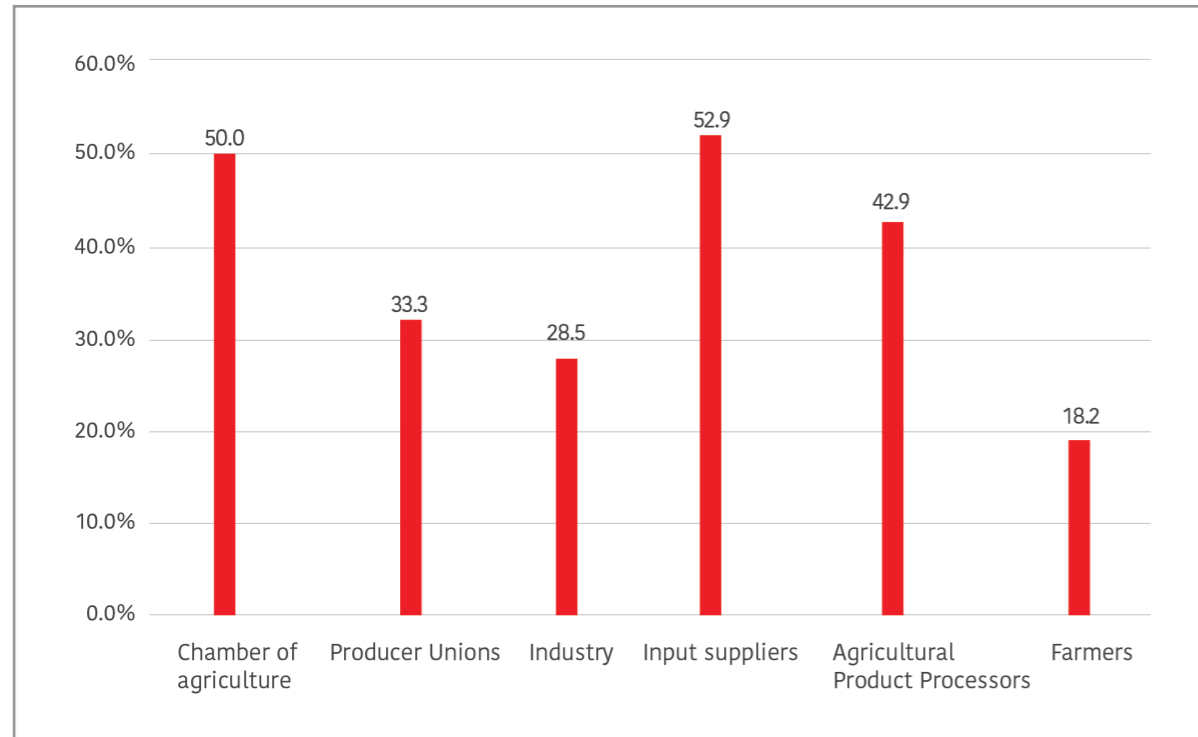
The Turkish government announced and provided specific support measures in order to mitigate the negative economic impacts of COVID-19 in Turkey. Institutions and organizations in the agricultural sector and farmers were among those allowed to apply for support. The most important forms of support are the part-time working allowance, concessional loan opportunities from public banks, deferral of credit debt by public banks, concessional loans offered by private banks under the Credit Guarantee Fund, and municipal supports.

Private companies procuring inputs for agriculture were found to benefit the most from government support to the sector. These firms used concessional loans provided by public banks. They benefited from part-time working allowances, and some of them benefited from concessional loans provided by private banks.

Chambers of Farmers and Producers Unions benefited from concessional loans from public banks in order to realize their investments (Figure 22).



Figure 22. Uptake of economic supports (%)



The proportion of farmers benefiting from support is low compared to the other institutions and organizations. There are basically two reasons for this low rate. One of them is that 20% of the farmers applied for concessional loans but were not found eligible due to their previous debt. The second reason is that farmers, especially those who manage their farms through the tenancy method, could not benefit from the loans.

4.5.2. Employment

The agricultural sector is a labor-intensive sector and mechanization is lower than in other sectors. This means the need for human labor is much higher than in other sectors. This part of the study tries to answer the question of how employment in the agricultural sector affects both skilled and seasonal agricultural work during the pandemic period.

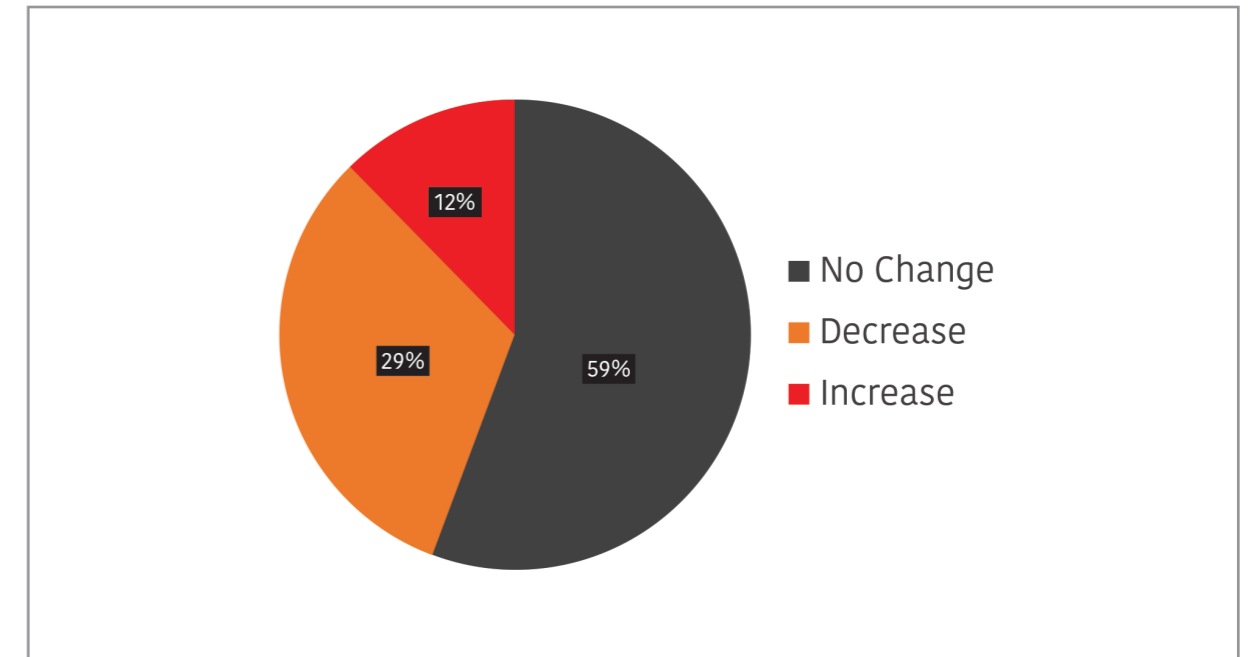
Since the MoAF and its provincial/district directorates have greater general coordinating, management, monitoring and policy making duties in the sector compared to other institutions and organizations, the employment measures taken by MoAF during the COVID-19 period should be evaluated separately from those taken by other institutions and organizations.

The rules for personnel at the directorates were announced and implemented without any distinction based on sex. People applied for the necessary legal permissions, while other staff worked in rotation.

The Turkish government has taken certain measures to counter the possible changes in employment and the problems that may arise as a result. Specific funds were allocated to support small and medium-sized enterprises on the condition they retain employees. Farmers and seasonal agricultural workers were given permission for free movement. Both farmers and other stakeholders were asked about the employment situation and their attitudes to it. Since MoAF is public institution and there have been no changes in employment due to COVID-19 at the Ministry and its directorates, MoAF representatives were not asked to answer the questions related to employment changes and employment support.

According to the study findings, the institutions and organizations interviewed have different attitudes and have come to different conclusions regarding employment (Figure 23).

Figure 23. Employment status in companies/ organizations



During the pandemic, some institutions reduced employment.

- There was no reduction in employment at the Chambers of Agriculture, producer unions, commodity exchanges and wholesale markets and their affiliates.
- Qualified foreign personnel working in agricultural processing firms were unable to travel from abroad during the pandemic period. This resulted in some loss of employment.
- 14.3% of the firms that receive inputs from agriculture reduced employment. The reason given for this is that the employees had chronic illnesses or were over 65 years of age. Part of their monthly income was covered by the short time working allowance.
- 6.2% of the companies that sell inputs to agriculture put their employees over the age of 65 on administrative leave and continued to pay their monthly wages.

On the other hand, some institutions increased employment during the same period.

- 66.7% of Producer Unions increased the number of their personnel by an average of 15-20%. They temporarily employed male workers from the employment agency İş-Kur depending on the increase in the amount of processing. Another reason for the increase in employment was seasonal labor needs. For example, the producer unions hired temporary workers to produce silage from maize.
- 35.7% of the firms that use agricultural raw material periodically employed temporary workers.
- 16.2% of agricultural product processors and 25% of companies working in fruit and vegetable wholesale markets employed temporary workers on a daily basis or for short periods.



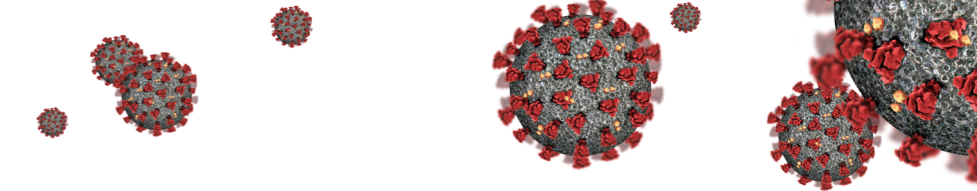
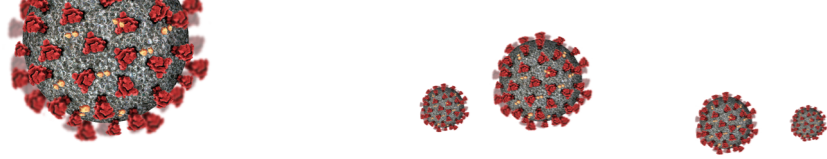
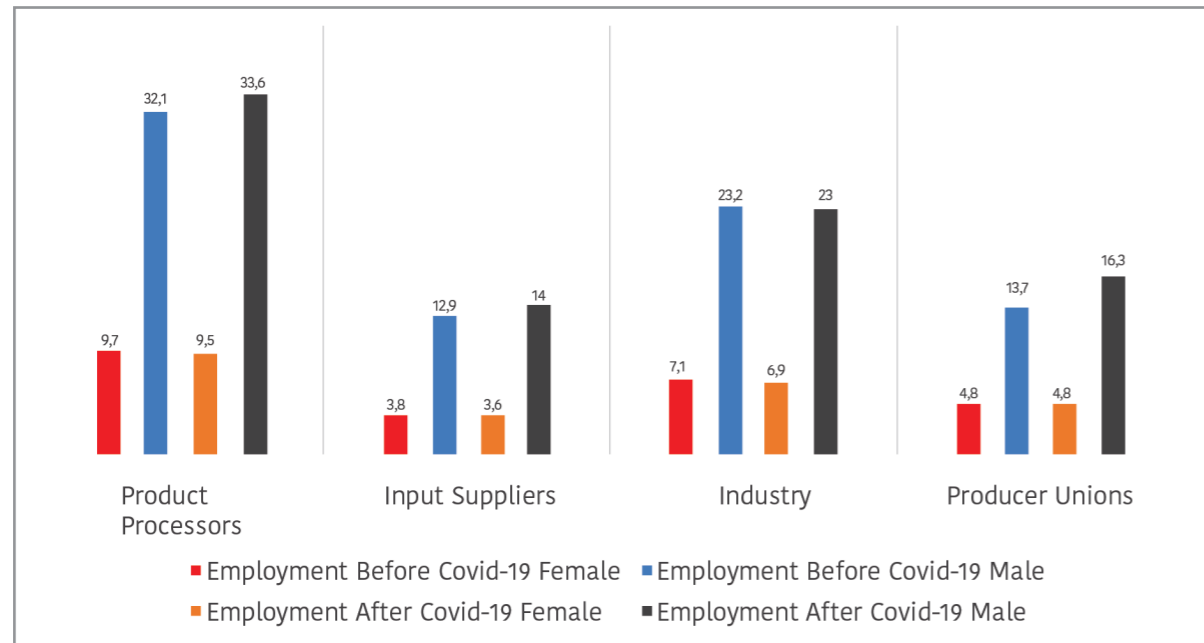


Figure 24. Average number of employees in companies and organizations (persons)



4.5.3. Women's role and seasonal workers

The most important reason for the failure of agricultural development efforts in developing countries to achieve the desired targets is the lack of appreciation of the role of women in agriculture and the lower rate of formal female employment in the agricultural sector compared to men.

In this study, women were found to account for about one quarter of employment in the institutions/organizations/companies of the relevant agriculture sector stakeholders.

On the other hand, there were no major changes in the employment of women in these institutions/organizations/companies during the outbreak period, and the female employees are understood to have continued at their jobs.

Female agricultural advisors and other female employees continued to work within the producer organizations or chambers of agriculture.

In addition to the employment created by institutions/organizations/companies in agriculture, it is necessary to examine the situation of seasonal agricultural workers, who work unofficially and without social security.

This year, for the first time in many years, Europe's major food producing countries could not find enough agricultural workers. Some agricultural products could not be harvested and rotted in the field.

The pandemic has led to a better understanding of the important function which migrant workers play in the leading agricultural countries. Some European countries brought in agricultural workers from Bulgaria and Romania by charter aircraft, and others took additional measures for the employment of domestic and international temporary agricultural workers. As an example of these measures, agricultural workers were given the opportunity to work for up to 115 days without paying tax, whereas previously they were only allowed to work for 70 days without being registered in the social security system.



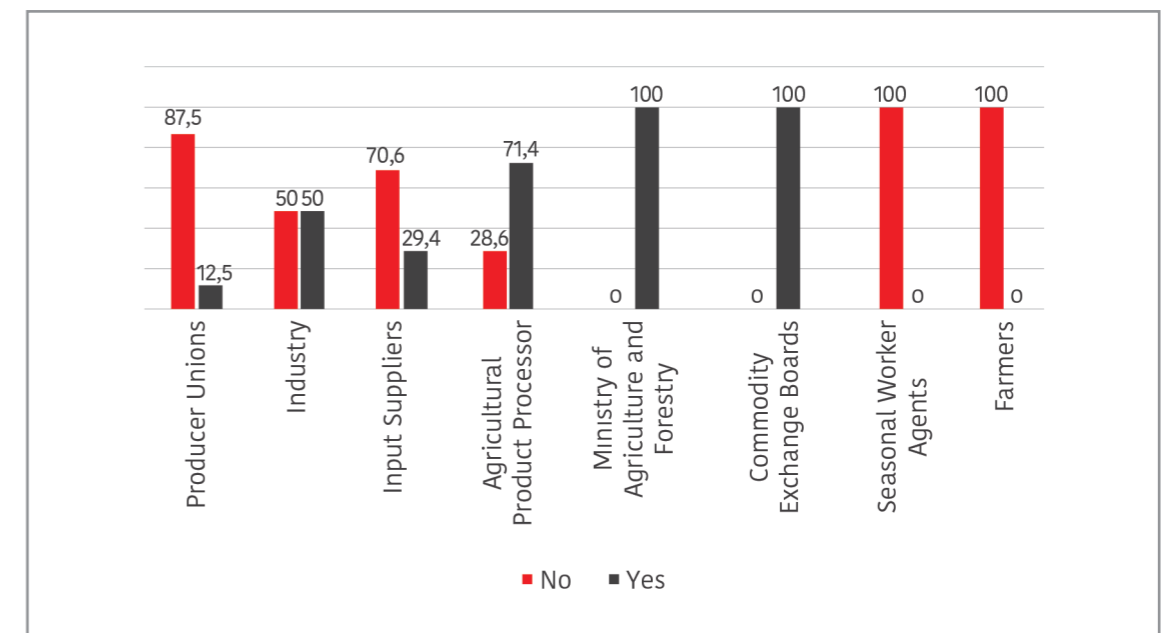
4.5.4. Biosecurity rules

Fears and uncertainties caused by COVID-19 have changed everyday life. Concepts such as physical distancing, environmental awareness, sustainability, and biosecurity have entered daily circulation, and there has been an increase in the use of digital applications.

COVID-19 is potentially highly susceptible to the implementation of biosecurity measures because it is highly dependent on the actions of people for its spread. Emphasis should be placed on biosecurity which has a proactive preventive impact and will enable livestock producers to protect their livestock and farms themselves. Biosecurity is made up of three components: segregation, cleaning and disinfection. Segregation is the most important phase of biosecurity, even for large commercial livestock units, because it avoids the possibility of infection entering a unit. Cleaning will remove most contamination, with disinfection as the final stage to deactivate any remaining viruses. (See: Annex-1.)

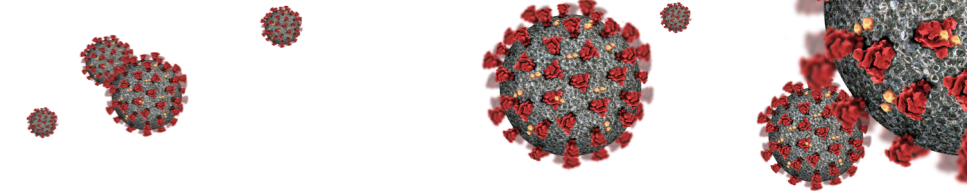
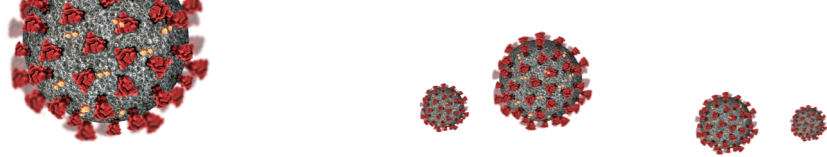
In this period, all stakeholders working in the agricultural sector have accepted and started to make use of biosecurity concepts. The proportions of the institutions/organizations/companies/producers interviewed who were aware of the concept of biosecurity are presented in Figure 25

Figure 25. Awareness of biosecurity (%)



Product processors familiar with the concept of biosecurity were already applying biosafety rules in their organizations before COVID-19. Dairy processing companies and plants producing feed additives, in particular, were already conducting their activities in accordance with biosafety rules. Food processing companies that purchase milk, and fresh fruit and vegetable exporters, were also found to be aware of the concept of biosecurity.

Farmers and seasonal agricultural workers are not aware of the concept of biosecurity. The most important reason is there were no previous extension activities for these groups. However, provincial sanitation committees, governorates, provincial health directorates, gendarmerie commands and municipalities have all been involved in the distribution of disinfectants, the disinfection of tents and the use of masks in the temporary camps where seasonal agricultural workers live, and have informed seasonal agricultural workers about the precautions they must take. The farmers were farmers were informed about the health measures to be taken in agricultural activities, both provincial health directorates and district directorates of the MoAF conducted information activities in the villages quarantined during the pandemic. When two



locations in one district were put under quarantine, for example, the farmers were able to continue their agricultural activities, the milk produced continued to be collected, subject to the necessary precautions (such as disinfecting milk tankers), and there were no disruptions to veterinary services. In another district, milk companies were reluctant to buy milk from a village with high milk production potential which had been quarantined. In response, the district directorate of the MoAF carried out information and guidance activities, especially for woman farmers, to help them use the milk to produce cheese and yoghurt. When the quarantine period in the village ended, the products were sold in marketplaces at district centers and in the surrounding villages with the help of MoAF staff, compensating for the economic losses.

Although the concept of biosecurity was unknown to most respondents, it was observed that all the respondents obeyed the rules on wearing masks and physical distancing. Another significant point is that a small proportion of farmers normally resident in city centers chose not to travel to their farms and orchards due to health concerns, despite having legal permission to do so during the curfew. In one district, farmers residing in the district center had to stay at home during the first 10 days of the COVID-19 outbreak due to health concerns. Since they could not plow their land during this period, they had to plow twice later. This led to an increase in input costs.

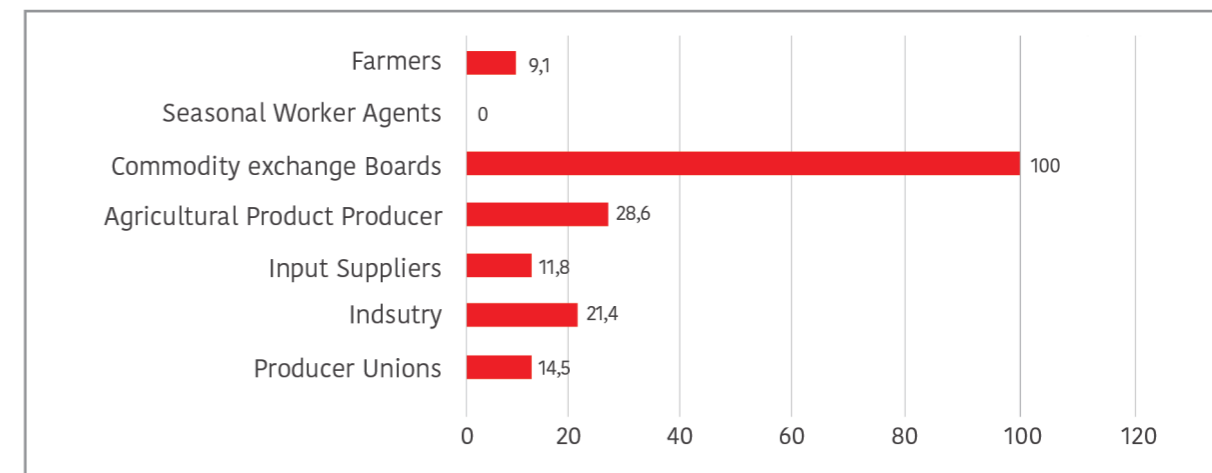
Within the scope of biosecurity measures, particular sector institutions/organizations have made changes to some of their functions. For example;

- Milk producing facilities prepared their own action plans during the COVID-19 period and took various measures for their employees. They made arrangements for the employees to stay on the premises continuously, so that production continued without interruption.
- In the tents of seasonal agricultural workers, the tea glasses used by household members and the tea glasses used to serve guests were separated, and the guest glasses were not used by members of the household.
- Biosecurity measures were implemented intensively at the Commodity Trade Exchanges during the pandemic, and it was made obligatory for everyone entering the building to use a mask and have their temperature measured on entry.
- To prevent crowds, the number of market days in district centers was increased from one day to two days a week.
- Due to biosecurity measures taken at feed processing plants, staff transport and meal costs increased.

4.5.5. Use of digital technology

Stakeholders in the agricultural sector were found to have developed their skills and increased their use of new technologies and digital communication channels during the outbreak period (Figure 26).

Figure 26. Use of new technologies (%)



The MoAF provincial/district directorates generally held their meetings online during the pandemic period. They are in a more advantageous position than other institutions/organizations and producers with respect both to infrastructure and to the technical means available. Staff working at the provincial/district directorates used various digital platforms. They were also seen to be in contact with producers through various internet channels.

Food processors have adopted new technologies more easily than other stakeholders, transferred their marketing strategies to the digital world, and delivered their advertising campaigns to their customers via digital media.

Certain number of the small family farms stated that they bought the pesticides they needed on digital markets during the COVID-19 period. Some of the companies selling milk and dairy products made their sales over the internet or by telephone. The volume of these electronic sales was approximately twice as high as in the months prior to the pandemic. According to the field study results and observations, no major changes were observed during the pandemic period in the areas of environmental protection, reducing the use of pesticides, switching to organic production and good agricultural practices, pasture use or animal welfare.

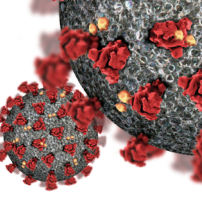
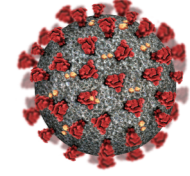
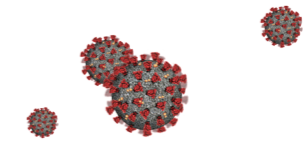
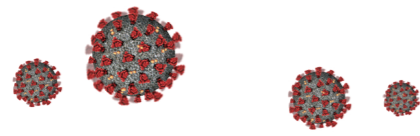
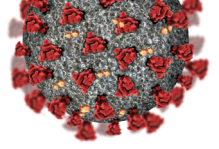
4.6. Overall Assessment of Impacts

In order to understand and assess the degrees of significance of the various impacts of COVID-19, this study uses the Fuzzy Paired Comparison Method to evaluate the public and private sectors, NGOs and producer unions and farmers.

These stakeholders are treated as three separate groups: 1) The public sector and farmers' (producers') organizations, 2) the private sector and 3) farmers.

Descriptive statistics for the impact areas of COVID-19 for the public sector and farmers' organizations as a whole are given in Annex 2, Figure 4. According to the public sector and farmers' organizations, the most significant impacts of COVID-19 are the economic and health impacts. Social impacts are seen as the third most important impact area and technology use as the fourth. Environmental effects are regarded as the least most important impact area. There is a need to clarify what is understood by the environmental impact of COVID-19 in order to avoid misunderstandings. For some in the public sector, COVID-19 has had a





positive environmental impact because the use of chemicals declined as a result of fewer activities in the field on account of COVID-19 restrictions. But for farmers' organizations this may be negative. In addition, issues related to climate change and adverse weather conditions may overlap with the negative impact of COVID-19, so that farmers' organizations may not be able to identify absolute impacts on the environment during the said period.

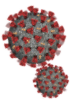
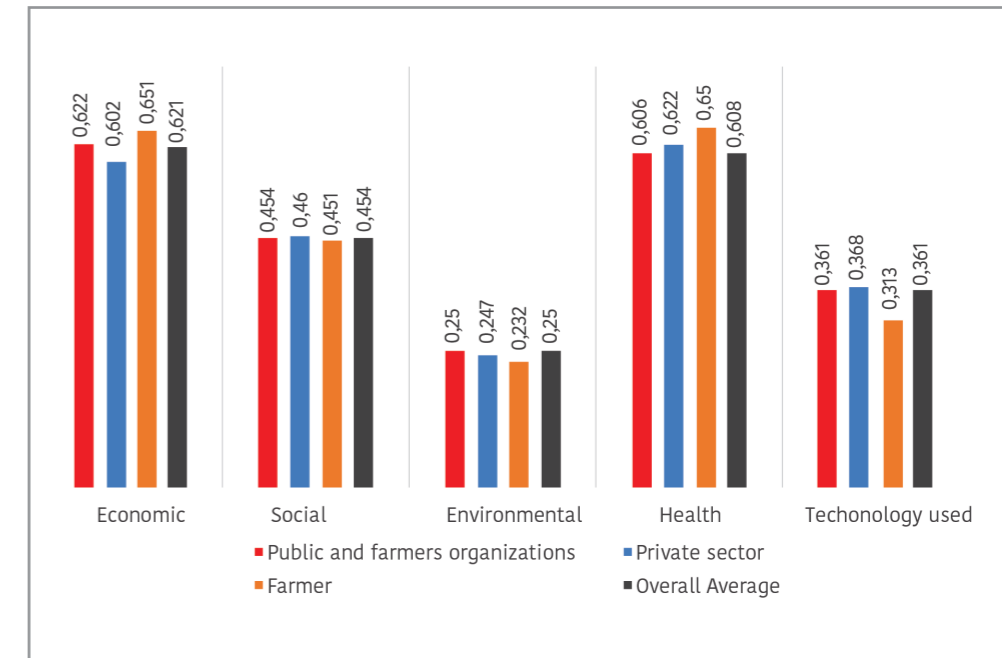
Descriptive statistics for the significance of the various basic impact areas of COVID-19 for the private sector are given in Annex 2, Figure 5. According to the private sector, health is the most significant risk factor. Economic impacts come second behind the health issue. The private sector has greater concerns about health risks than the public sector and farmers' organizations. Social impact comes third, but its average score is higher than for the public sector and farmers' organizations. There is a low level of positive impact in terms of technology use. Further, environmental impacts were assigned the least impact as they cannot be observed in the short run by most individuals.

Descriptive statistics showing the evaluation of the impacts of COVID-19 made by farmers are given in Annex 2, Figure 6. The most significant impact area for farmers is the economic impact (0.651), very closely followed by the health domain (0.650). To all intents and purposes, the perceived impacts in these two areas are of equal significance for farmers. Social impacts rank third. The average score for social impacts is lower than that of the other stakeholders. This may be due to the dynamics of rural life and the lack of restrictive measures (such as curfews) affecting producers' activities during the pandemic. Just like the other two groups, farmers ranked the positive impacts of the pandemic on technology use fourth among the five impact areas. However, the average score for this impact area was lower than for the other groups. This may be due to a general characteristic of farms, where capital use is lower than in other sectors. As in all the other groups, environmental impacts were not considered to be very significant. It is likely that farmers were unable to differentiate environmental impacts effectively from economic impacts.

Finally, an overall evaluation of the perceptions of the areas in which COVID-19 has affected the agricultural sector most significantly across all three groups shows that the most significant areas of impact is economic impact. Health impacts follow economic impacts very closely. Social impact is considered the third most significant of the categories examined. The impacts on technology use are placed fourth and environmental impacts rank last (Annex 2, Figure 7; Figure 27).

By comparison with the other groups surveyed, farmers have most clearly identified the significance of the economic impact of COVID-19. Farmers are also the group placing the greatest significance on the health aspect. The private sector is the group that is noticing the greatest social impact, while the public sector and farmers' organizations is the group that attaches the most significance to the environmental impact. The private sector reports the highest positive impact on technology use (Figure 27).

Figure 27. COVID-19 impact areas by stakeholder group



5. ASSESSMENT OF THE IMPACT ON SMALLHOLDERS, RURAL ECONOMIES, RURAL LIFE AND RESILIENCE

In Turkey, as in most countries in the world, there are disparities exist between rural and urban areas. Moreover, the levels of development of rural settlements differ significantly both between and within provinces. While there are various reasons for these disparities, the particular are location, differences in natural resources and the socio-economic structure. Viewed more closely, levels of development in rural areas reflect factors such as climatic and geographic conditions, the structure of farms and farming, the level of poverty, the level of productivity, the distance to urban centers/markets, the degree of aging of the population, the tendency of young people to migrate or remain in the area, and the overall quality of life. Recently, the quality of the internet network has also come to affect the differences in the quality of life in rural areas. A strong internet connection has become just as important as other needs, especially during the pandemic, and rural areas are no exception.

Rural regions have been particularly vulnerable to the COVID-19 pandemic because they have (OECD, 2020):

- A much less diversified economy;
- A large share of population who are at higher risk for severe illness, notably the elderly and the poor;
- A high share of workers in essential jobs (agriculture, food processing, etc.) coupled with a limited capability to undertake these jobs from home. This makes virtual working and social distancing much harder to implement;
- Lower incomes and lower savings may have forced rural people to continue to work and/or not visit the hospital when needed;
- Larger distance to access hospitals, testing centers etc.;
- A large digital divide, with lower quality internet access (both in coverage and connection speed) and fewer people with adequate devices and the required skills to use them.

On the other hand, COVID-19 may not have severe negative economic effects on rural people in the short term. According to the findings of this study, COVID-19 has not resulted in immediate economic damage for those engaged in the production, processing or marketing of many product groups. As the pandemic is expected to continue for some time, its economic effects on rural communities in the medium to long term might be far more severe. The farmers and stakeholders surveyed were very concerned about economic impacts, and they may prove to be far-sighted.

5.1. Small Family Farms

People who are already vulnerable in terms both of low income and of limited access to social services, medical care, and social protection, have less capacity than others to cope with any crisis. They have limited ability to cope economically. Smallholder farms are a vulnerable group by these criteria. They depend mostly on agricultural production for survival and sell their produce mainly in the local market or at the farm gate.

According to FAO, about 90 percent of the world's farms are owned and operated by families and are small in size. Many of these smallholder family farmers are poor and food insecure and have limited access to markets and services. Their choices are constrained, but they farm their own land and produce food for a substantial proportion of the world's population. Besides farming they take on multiple (often informal) economic activities to contribute towards their small incomes. There is a need for sustainable agricultural practices in order to tackle the triple challenge of producing more food, creating more jobs and preserving the natural resource base (FAO, 2014).

The strategic importance of agriculture has come to be very well understood in the COVID-19 period. Small family farms must adapt to the changing habits of society and adopt new technologies in order to reduce their vulnerability, ensure continuity of agricultural production, and increase competitiveness. For this reason, the present study has evaluated the impact of COVID-19 in the economic, social, health and environmental domains, as well as its impact on the use of technology, and the findings have been presented in detail in Section 4. According to the same classification, the findings of the survey concerning the impacts of COVID-19 on smallholder farmers in particular are summarized in Table 3 and Table 4.

Table 3. Impacts on crop production

	Level of significance	INDICATORS	CROP PRODUCTION					
			Grain	Pulses	Roots and tubers	Fruits	Vegetables	Vegetables (Greenhouse)
SOCIAL IMPACT	3	Tendency to remain on the farm	😊	😊	😊	😊	😞	😞
		New collaborations set-up	😊	😊	😊	😊	😊	😊
		Women's participation in the labor force	😊	😊	😊	😊	😊	😊
		Youth participation in the labor force	😊	😊	😊	😊	😊	😊
ECONOMIC IMPACT	1	Income	😊	😞	😞	😊	😞	😊
		Input purchases	😊	😞	😞	😊	😊	😊
		Input sales	😊	😊	😊	😊	😊	😊
		Number of buyers	😊	😞	😊	😊	😞	😊
		Cost efficiency	😊	😊	😊	😞	😞	😞
		Achievable input prices	😊	😞	😊	😞	😞	😞
HEALTH IMPACT	2	Mask use	😊	😊	😊	😊	😊	😊
		Care for physical distancing	😊	😊	😊	😊	😊	😊
		Care for personal hygiene	😊	😊	😊	😊	😊	😊
		Concern for In-House Cleanliness	😊	😊	😊	😊	😊	😊
		Concern for Environmental Cleanliness	😊	😊	😊	😊	😊	😊
ENVIRONMENTAL IMPACT	5		😊	😊	😊	😊	😊	😊
TECHNOLOGY USE	4		😊	😊	😊	😊	😊	😊

Increase: 😊 No change: 😊 Decrease: 😞



Table 4. Impacts on livestock production

	Level of significance	INDICATORS	CROP PRODUCTION			
			Red Meat	Milk	Eggs	Honey
SOCIAL IMPACT	3	Tendency to remain on the farm	☹️	☹️	❓	❓
		New collaborations set-up	☹️	😊	❓	❓
		Women's participation in the labor force	☹️	❓	❓	❓
		Youth participation in the labor force	☹️	❓	❓	❓
ECONOMIC IMPACT	1	Income	☹️	☹️	😊	😊
		Input purchases	☹️	😊	❓	❓
		Input sales	☹️	☹️	❓	❓
		Number of buyers	☹️	☹️	😊	😊
		Cost efficiency	😊	😊	❓	❓
		Achievable input prices	😊	😊	❓	❓
HEALTH IMPACT	2	Mask use	😊	😊	😊	❓
		Care for physical distancing	😊	😊	😊	❓
		Care for personal hygiene	😊	😊	😊	❓
		Concern for In-House Cleanliness	☹️	☹️	❓	❓
		Concern for Environmental Cleanliness	☹️	☹️	❓	❓
ENVIRONMENTAL IMPACT	5		☹️	☹️	❓	❓
TECHNOLOGY USE	4		☹️	😊	❓	😊

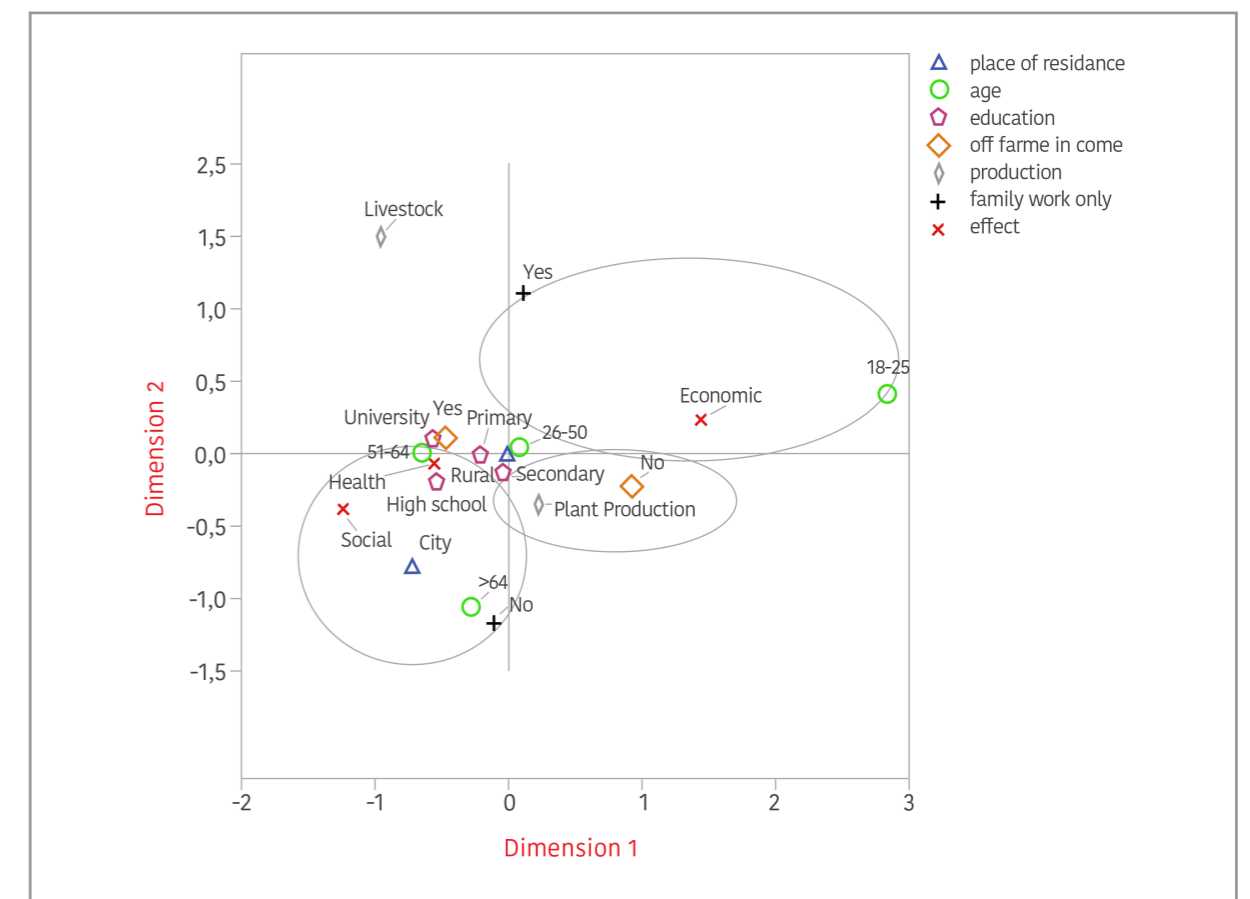
Increase: 😊 No change: ☹️ Decrease: ☹️

According to the results of the analysis, small family farms are mixed farms and earn their livelihoods from both crop and livestock production throughout the year. In the pandemic period, small family farms have experienced the economic, social and health impacts of COVID-19 differently depending on their age groups and levels of education, the settlements they inhabit and the patterns of production in which they are engaged. The data obtained from the farmer surveys were also evaluated with the Multiple Correspondence Analysis. The results are shown in two-dimensional form in Figure 28.

The results could be summarized as follows:

- The age range of the farmers who considered COVID-19 to have remarkable economic impacts is generally between 18 and 25, they produce vegetables in general, do not employ foreign workers, do not earn non-agricultural income and have an education level of 5 years.
- Farmers who live in rural areas throughout the year and who are in the age group 51-64 expressed the opinion that health impacts were higher after the pandemic.
- Farmers who live in the city or district center, are 65 or older, carry out their production activities by hiring permanent or temporary workers from outside the family are mostly affected by health and social aspects during the pandemic.
- Farmers engaged in livestock production within small family farms (especially sheep and goat breeding) complained about fluctuations in meat and feed prices during the pandemic as the only negative effect.

Figure 28. Attitudes of smallholder farms by selected characteristics.



It was found that small family farms which use family labor and do not use external labor will have difficulties surviving in the case of a prolonged pandemic period, and may be unable to maintain their production activities for a long time. Supporting small family farms is important not only for maintaining production and national food security, but also for mitigating the effects of the crisis and retaining the vitality of rural areas. For this purpose, it is necessary to continue encouraging farmers to adopt a market-oriented production pattern including high value-added products, to adopt cost-reducing production techniques and to develop their capacities for record keeping, business administration, marketing, risk management, financial literacy and so on. The survey data supports this field study finding.



5.2. Gender and the Rural Economy

The impacts of COVID-19 have been experienced differently by gender. Many frontline occupations can be said to have been affected disproportionately by the outbreak. Teachers, healthcare workers and nurses are predominantly women. Throughout Turkey and in rural areas, women are predominantly responsible for childcare and homeschooling, which is likely to have gendered implications for families (Phillipson et al., 2020).

In this study, the focus group meetings helped to assess rural resilience and livelihoods in terms of gender and with respect to children and youth, the labor market, rural jobs and rural incomes. One focus group meeting was held with rural women in a mountain village (the village of Karahamzalı in the Kozan district in the province of Adana). Five women attended the women's focus group discussion. Although there are 200 households in the village, only 70 households live there permanently. All of the women who participated in the focus group meeting live in the village throughout the year. They are generally primary or secondary school graduates. They sell vegetables and other produce (lettuces, cabbages, cress, and parsley) in the district markets.

The women stated that they worked in weeding and crop harvesting in their family gardens. Animal husbandry in the village was abandoned five years ago. Goat breeding is carried out by one or two households for their own needs. Two of the women interviewed stated that they work for a daily wage of TRY 70 during the harvest period. They can work a maximum of 50-60 days a year for the harvest. During the COVID-19 pandemic, there was no loss of agricultural income in the region since it did not coincide with the harvest period.

During the pandemic period, there was no activity in the gardens other than weeding. The women stated that they could carry out this activity with permits obtained within the village boundaries. The issue of the lack of fruit drying facilities in their village became more pronounced with the pandemic.

The women were aware that the demand of people living in cities for dried fruits was increasing. They said that they would earn more income if there were a fruit drying facility in their region. The focus group meeting identified the establishment of a drying facility as the most important investment needed in the village. With a drying facility, the farmers would be able to double their incomes. Due to the curfew measures, some of the villagers' relatives who were living in provincial and district centers came to the village and repaired their existing houses or built new ones. Seven or eight households returned to the village during the pandemic.

The women did not leave the village during the pandemic period. They stated that they observed physical distancing rules when meeting people coming from outside the village, and did not host them in their houses. The women stated that they do not wear masks since they work with family members in the gardens. There were no COVID-19 cases in the village during the pandemic.

One of the most important problems during the pandemic period concerned their children's education. Due to the mountainous nature of the region, the internet connection is poor and often interrupted. As a result, children of school age had difficulty following the online lessons.

In their spare time, the children continued to help with household duties and agricultural activities in the same way as before. The women said the children continued to help with these jobs just as much as they would in normal times.

In the focus group discussions held with woman farmers, the women said that they had made efforts to implement the necessary measures for themselves and their children during the pandemic period. Besides health issues, the women also spoke of the economic issues related to COVID-19. According to the FAO, if women had equal access with men to the resources and services needed for agricultural production, their agricultural production



Photo: Erkan Pehlivan, Özdal Köksal

would increase by 20 to 30 percent. The findings of the focus group meeting with women supports this assertion. The women's economic concerns are clear from the support which they gave to their families during the pandemic period (such as when they tried to sell vegetables, fruit and especially pulses, in those markets that were open during the pandemic period), and their request for the government or an international organization to provide a drying facility in their region.

Women are involved in all areas of crop and livestock production, but they stated that their influence on the ownership of means of production, especially land, and on the processes of purchasing inputs and selling products, was very limited, both before and during the pandemic. Another issue raised during the focus group meetings was the increase in the women's responsibilities, and hence in their workload, which came with the closure of the schools. Before the pandemic, the women reported, they were able to work in their gardens and farms while the children were at school, but during the pandemic period they were not able to allocate sufficient time to agricultural work.

The study findings and field observations indicate that the differences between rural and urban areas have increased with the pandemic. The workload of women has expanded, and the inequalities faced by women, youth and children in terms of living conditions and access to services – including compulsory education, a basic right – have increased. These inequalities are even greater among families of temporary agricultural workers.

5.3. Rural Resilience

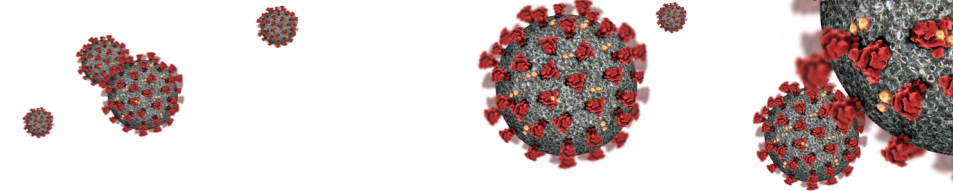
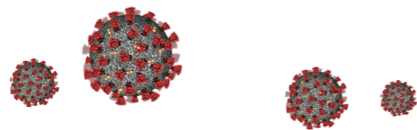
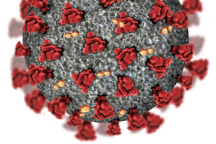
While agriculture is the major food-producing sector, rural development is related to the promotion of the vitality of the countryside and the well-being of rural communities. Rural areas provide food, raw materials, jobs and a wide range of environmental goods and services such as cultural landscapes, biodiversity, carbon storage, water and soils (EU, 2016)



Photo: Erkan Pehlivan, Özdal Köksal

Rural economies with higher levels of self-employment, and small and micro-enterprises with limited solvency and cash reserves, are likely to be less well prepared for the disruption caused by COVID-19. Coping strategies involve reductions in household consumption, investment and spending to compensate for the reduced flow of income from businesses to households. In contrast, it is also likely that COVID-19 will stimulate many examples of innovative community and business responses and adaptation across rural areas. Necessity is an important driving force for rural business innovation. For instance, creative and digital businesses may have taken advantage of the opportunities afforded by people working from home while other businesses are also likely to face additional demand or to identify complementary or alternative products and markets, and this in turn will require innovation in their processes, goods and services (Phillipson et al., 2020).

As part of the current study, a focus group meeting was held with six male farmers in a mountain village (the village of Narlıdere in the central district of Karaman province) whose livelihood depends on greenhouse agriculture. The farmers grow vegetables and sell their products weekly at local markets held in the nearest district centers. During the pandemic period, they did not experience any problems in obtaining seedlings, chemicals or fertilizers. However, they experienced a loss of income (20% on average) due to the closure of local markets. Once market days resumed, they could not sell the same quantity of their product as before due to the low number of buyers.



The biggest loss of income suffered by the small family farms in the village was not in the agricultural sector but rather in non-agricultural jobs. The villagers reported that almost every family had members who went to work in hotels in Antalya and Mersin for at least five months of the year during the tourism season. The income earned in the tourism sector contributed to the livelihoods of the families throughout the year. However, because the hotels were closed, the young people were unable to go to work there, and the households lost a major source of income. During the focus group discussions, it was reported that young people earn approximately TRY 25,000-30,000 per season in the tourism sector, and that such an amount can hardly be earned in agriculture in a whole year.

In the light of the study findings, it is important to ensure that farmers have access to the information they need as well as to create income-generating activities and provide investment supports to increase resilience in rural areas. During the field visits, the investments in villages funded by UN institutions were found to be a good example of sustainable investment contributing to rural development.

Some of the villages in Konya and Karaman provinces visited as part of the study are in the IFAD funded GTWDP area. The GTWDP area is home to more than 30,000 households living in 212 villages in a mountainous area where the altitude varies between 600 m and 1800 m. Under GTWDP, the grant programme for Mushroom Greenhouse Installation ensures women's participation in income generating agricultural activities through the construction of mushroom greenhouses with heating and humidification features. In Konya, the cluster approach was followed in the establishment of 32 greenhouses for mushroom production. Previous experiences have shown the positive impact of the mushroom greenhouses on employment and income growth. The Grant Call is only open to woman farmers. Input purchases and product marketing are supported by a newly established cooperative. Another example of the cluster approach is the grant support for the establishment of vegetable greenhouses (101 in total, including 16 for women) that has had a particularly strong impact in Karaman.

During the field visits, it was observed that GTWDP had created an increase in employment, which was one of the objectives of the project. A woman producer in the Bozkır district of Konya received support after her workplace was closed during the pandemic. She, her son and her daughter-in-law lived in the city center but had gone back to the village and started to work in the mushroom greenhouse as of April. Input purchases and sales were supported by a newly formed cooperative. The other investments under GTWDP are the vegetable greenhouses established in the mountainous regions of Karaman. The beneficiaries said that they had the advantage of generating income during the pandemic. Most notably, young people who usually worked in hotels in Antalya had started to earn income by working in these greenhouses with their families. Thus the support provided has minimized economic losses in rural areas as well as enabling young people unable to work due to the situation in the tourism sector to participate in production.

Integration with the market has become a more prominent issue during the pandemic. During the field study, farmers who had achieved a high level of integration were observed to have been less badly affected by COVID-19 economically. The investment supports provided to farmers depending upon the characteristics of the farms have stimulated integration and eventually made farmers more resilient, even at a time of crisis. Farmers who received FAO support were visited as part of the field study in the Kadınhanı district of Konya as well as the vegetable greenhouses in Konya that were established with FAO support under the Project Agricultural Implications for Ecosystem Based Adaptation to Climate Change in Steppe Ecosystems conducted in 2016-2018. The project's aim was to increase the resilience of societies and steppe ecosystems to the impacts of climate change. Under the project, greenhouses were established for vegetable production along with geomembrane pools, and extension services were provided. The farmers stated that the demand from brokers for tomatoes and peppers grown in these greenhouses during the pandemic period had been very high and that they had increased the price of their products.

These two cases show that the provision of support within a holistic approach leads to more successful outcomes.

One way to increase resilience is to use technology. This study looked into the extent to which small family farms benefited from technology during the pandemic period. Although the use of internet and smartphones is widespread in rural areas, it was found that farmers in rural areas and settlements far from city centers are unable to make sufficient use of the opportunities offered by technology, or are not even aware of them. Digital media and technologies are unrivalled in terms of giving instant access to producers during a pandemic or similar crisis. One important reason for using these technologies is their low cost. Digital communications can overcome barriers of time and space to provide farmers

with information. They provide two-way communication as well as delivering visual, verbal and written information. In addition, information and extension activities delivered in this way allow the information to be received, stored and shared with the target audiences, not just at the moment when the information is sent, but whenever the recipient deems appropriate. Measures and practices for using digital platforms for small family farms should be included in the medium and long-term measures to be taken during the pandemic. In addition, digital environments can create a very equitable environment for farmers in terms of access to needs. For example, in regions with socio-cultural difficulties in face-to-face access to woman producers, digital platforms can contribute to overcoming these barriers.

5.4. Summary of Smallholders, Rural Economies, Rural Life and Resilience

- (a) Smallholder farms which have low incomes and limited access to social, health and digital services are already vulnerable, and have limited capacity to cope with any crises.
- (b) Small family farms are mixed farms earning their livelihoods from plant and animal production over the course of the year. During the pandemic period, small family farmers were faced with different economic, social and health impacts depending on their age groups, levels of education, types of settlement and production patterns.
- (c) The young population is more concerned about the economic impact of the pandemic. These concerns may trigger rural to urban migration in the medium and long-term.
- (d) The elderly population is more concerned about the health impact of the pandemic. This concern may trigger rural to urban migration in the medium and long-term with the aim of living closer to healthcare services and benefiting from them more.
- (e) The workload of woman farmers has increased with COVID-19. They are willing to work to increase their family income and seek opportunities to earn money.
- (f) The inequalities faced by women, youth and children in terms of living conditions and access to services, including the basic service of education, have increased. Families engaged in temporary agricultural work are particularly affected by such inequalities.
- (g) Children and young people living in rural areas are already disadvantaged by comparison with their urban peers, at least in terms of education services. COVID-19 has widened this gap.
- (h) Integrated investment support for rural areas is important for increasing rural resilience as in the examples of projects supported by IFAD and FAO.



6. CONCLUSION AND RECOMMENDATIONS

6.1. Conclusions

The pandemic has had a huge impact on daily life on every scale, from people in the street to businesses, the world economy, and all the actions and undertakings of humanity. Agriculture is no exception. COVID-19 and the associated control measures have had impacts on agriculture and rural areas in all over the world. Traders have been unable to purchase at the farm gate, open markets have been closed, and international trade has been interrupted and supply chains disrupted due to quarantining, border closures, and trade restrictions. This period has caused huge economic losses for certain sectors, while others benefited. For instance, the tourism sector has experienced enormous economic losses, while the digital sector has expanded.

The objective of this rapid assessment study is to determine the impact of COVID-19 on the agricultural sector of Turkey by focusing on rural smallholders and to provide policy recommendations for addressing the effects of the crisis on the target group. Based on study findings the impacts and gaps can be listed as follows:

- Although the pandemic initially had a shock effect on both consumers and producers, there were no substantial problems in the flow of food to the market due to the effective measures taken by the authorities and relevant stakeholders.
- With respect to food security, the availability of food on the market was not a serious issue.
- In the first phase of the COVID-19 crisis, export measures on products such as onions, lemons and watermelons affected the producers of these agricultural products and the markets for them.
- Due to the closures of restaurants, hotels and schools, as well as weekend curfews, perishable products such as lettuces were affected most during the first phase of the pandemic. Furthermore, closures of fruit and vegetable markets on the weekends caused demand to be concentrated on weekdays. Farmers producing and selling perishable products to the market or to intermediaries were unable to harvest, causing losses of both food and income.
- The prices of agricultural products varied by product group. Price fluctuations were higher in the first months of the pandemic, after which prices returned to normal levels. It is probable that factors other than COVID-19 played a role in these price changes. In general, the pandemic cannot be said to have created a major problem in terms of food accessibility.
- As hotels, schools and restaurants were closed and activities like picnics and outdoor meetings were banned, the demand for lamb and goat's meat shrunk and the incomes of sheep and goat producers were negatively affected.
- Milk and meat processing are labor-intensive operations and these sectors appear to be more sensitive to shocks. In confined spaces such as the packaging sections of milk and meat processing facilities, the necessary social distancing measures reduced the efficiency of operations. Hence, the need to ensure adequate protection measures for employees increased.
- Due to the weekend curfews, milk sales at the farm gate or in local markets were halted, and raw milk producers were severely affected.
- Input prices, mainly feed prices, increased during the first phase of the COVID-19. This price increase was partially reflected in milk and meat prices.
- No major problems arose in the supply of pesticides and fertilizers during the first phase of the pandemic, due to precautionary actions such as the monitoring of stock levels by input suppliers.
- Local milk processing facilities stored milk in the form of semi-finished products at -18oC due to the closure of restaurants, schools etc. This led to an increase in storage costs for local milk processors.
- Woman producers/farmers were unable to sell their products at local markets due to measures taken to control the spread of COVID-19. Moreover, due to the closure of the restaurants they could

not participate in service delivery in the food sector. Meanwhile, the closure of the schools obliged women to stay at home to take care of the children. Hence, women who live in rural areas were not able to meet their basic needs and were more severely affected by the crisis than men.

- In livestock production, herd management and animal care is generally undertaken by foreign workers and their families. Due to the restrictions, livestock farmers had a problem in hiring labor during the first phase of COVID-19. This problem was partially solved after restrictions were lifted.
- Demand for honey increased during the first phase of the pandemic, yet the honey sector was able to cope with higher demand and was not negatively affected.
- In general, farmers, producers, intermediaries and other related actors in the agri-food chain did not experience any major problems in access to farms or fields. However, farmers who have greenhouse or rental land and family members of farmers who works together with the farmer were reported to have faced difficulties. For example, while farmers who had registered with the Farmer Registration System (ÇKS) were exempt from the curfews, farmers who had not registered with ÇKS were unable to continue production due to the restrictions. Farmers working as tenants or share-croppers, and people seeking to move to rural areas and start working in agriculture also had difficulties in obtaining curfew exemptions in the early period of the Pandemic. Furthermore, sea fishers could not benefit from supports since they were not included or listed as beneficiaries in the support mechanism.

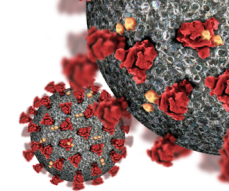
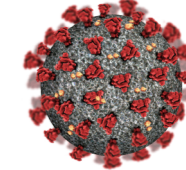
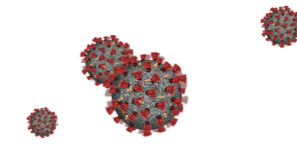
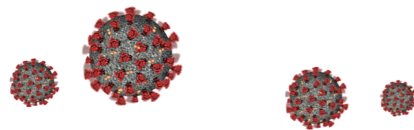
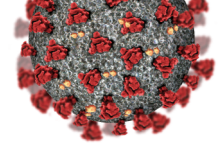


Photo: Erkan Pehlivan, Özdal Köksal

- Although production generally stopped in quarantined workplaces in other sectors, agricultural production continued when villages were even quarantined.
- Agri-food sector stakeholders have limited capabilities to use new information and communication technologies.
- During the first phase of the pandemic, priority was given only to agricultural food production, with social and environmental aspects either ignored or deemed secondary along the related agri-food supply chains associated with the unknown nature of Pandemic.
- COVID-19 is a very serious public health, economic and social crisis. While trying to tackle it, attention should also be paid to other threats such as inequalities, social-mental health care needs, gender violence and climate change.
- For the FAO-led and the IFAD-funded projects it is indicated that the producer income has increased during the pandemic. These projects do not simply provide investment support to farmers; they also offer them associated training and extension services with a more holistic approach.

The following recommendations are suggested based upon the field findings for prospective building back better development supports in the sector.





6.2. Policy recommendations for sector preparedness and response

Recommendation 1: Specific contingency and emergency protocols for Crisis Preparedness, Response and Resilience should be developed at agri-food sectors level, at spatial scales of basins, food industry clusters and villages to avoid any disruption to the services of inputs, veterinary and extension services in case of such emergencies and should be integrated into nation-wide emergency programmes.

- When mandatory curfews are enforced, all agricultural engineers working in the field to provide extension services and inputs should be exempted from the restrictions, as should veterinarians, regardless of whether they are employed in the public sector or the private sector.
- In quarantined villages, it is important to sustain agricultural production and ensure the livelihood of smallholder farmers.
- Since the start of the COVID-19 crisis, Turkish Government has established the Science Board, which gives recommendations on health measures/responses to combat the pandemic. The MoAF has also established a Pandemic Science Board within the Ministry with the participation of academicians, sectoral partners and high level officials. Prior to the next agricultural season, elaboration of a set of coordinated good practices by these two Boards may help to reinforce the capacity of the local administrations in combating the pandemic.
- Such attempt could also include worse case scenarios for the harvesting, marketing and storage of harvested products especially when the harvest coincides with curfew periods. It may also consider the case in which the disease spreads rapidly and widely, and the measures that might be implemented under worst case scenarios.
- E-systems should be established to allow the district directorates of MoAF to provide services online and at distance, thereby reducing the congestion at the district offices and preventing the spread of the disease among producers.

Recommendation 2: The fruits and vegetable wholesale markets which are the critical outlets for food provisions of city-regions should be under a differentiated regulation to keep the agri-food supply chains in operation in case of emergencies.

- When restrictions are adopted, regulations should be implemented to ensure that fresh fruit and vegetable wholesale markets are not completely closed or severely affected by these measures.
- It is crucial to ensure that the producers' marketplaces remain in operation with the necessary precautionary measures monitored by the municipalities.

Recommendation 3: A statistical monitoring and early warning system of production costs and agri-food supply chain prices should be developed for evidence-based policy making and response policy framework.

- In cases where exports cannot be made due to trade restrictions, closed borders or similar circumstances, measures may be taken not to disrupt the market balance of the products in question in the domestic market. These measures should be planned as part of the crisis response and resilience protocols for the agri-food sector that were mentioned in Recommendation 1.

Recommendation 4: The current monitoring systems of inputs like fertilizers, pesticides or others should be improved to allow strategic stock control and evidence-based policy decisions.

- It is essential to determine the current inventory of strategically important inputs in the agricultural sector such as vaccines, seeds, seedlings, fertilizers, pesticides, etc. and to prepare and implement scenarios for future production incentives, imports etc.

Recommendation 5: E-marketing and other short food supply chains tools should be developed and promoted to ensure access of rural smallholder farmers including women farmers to the conventional and other agri-food supply chains platforms including DITAP.

- Marketing has been one of the main problems for smallholders during the pandemic. Vulnerable groups should be prioritized in developing e-marketing systems. In order to facilitate the access of women and rural smallholder farmers to markets, an e-marketing platform should be designed or considered under DITAP.

Recommendation 6: Government support purchasing programmes should be developed and/or the current ones should be differentiated to avoid any possible food loss in the fields or in the other parts of agri-food chain in case of shocks and other sudden disruptions to support the resilience of the producers as well as sustainability of food systems.

- Actions should be put in place to purchase the products of producers who cannot sell their products due to restrictive measures. These products could be bought from the producers for use in social services via municipalities, district governorships, special provincial administrations and governorships or through state economic enterprises.
- Informing all stakeholders in the sector about "Food Loss and Waste" approach that was developed through cooperation between the MoAF and FAO.
- In extraordinary conditions, the agricultural sector is subject to intervention through regulations to control market supply and demand. These regulations should be used for emergency purchases of any agricultural product when necessary.

Recommendation 7: Food banking and other food saving programmes should be promoted to reduce any food waste in the retailing parts of the agri-food supply chain and in mass consumption sites.

Recommendation 8: A comprehensive animal disease control and prevention strategy should be laid down and effectively implemented by the related institutional setting of organizations, taken into One Health Approach within the context of Tripartite Working Group of FAO, OIE and WHO, to prevent any other zoonotic disease to occur in rural areas of livestock production and markets.

- It is important that other zoonotic diseases do not occur in the agricultural sector while dealing with the pandemic. The National Zoonotic Committee of Turkey should be given responsibility to follow up this issue with a view to controlling both COVID-19 and other potential zoonoses, and to prevent severe effects of the crisis in rural areas (see Annex-1).
- The effective adoption of the National Strategic AMR Action Plan which was prepared by the Turkish government in collaboration with WHO would also be a good step toward increasing the resilience in the sector within the context of post recovery policy setting.

Recommendation 9: A long term reaching and concerted awareness campaign on biosecurity applications and food safety standards should be prepared and launched to contain sector level impacts of such emergencies and diseases taken into accounts of the needs of smallholders, SMEs and family food businesses.

- It is critical to plan and put into practice activities aimed at raising awareness about biosecurity practices and food safety standards at every stage of the food supply chain. Ensuring that small family farms are provided with relevant information on these issues may help with their reception of safety measures.

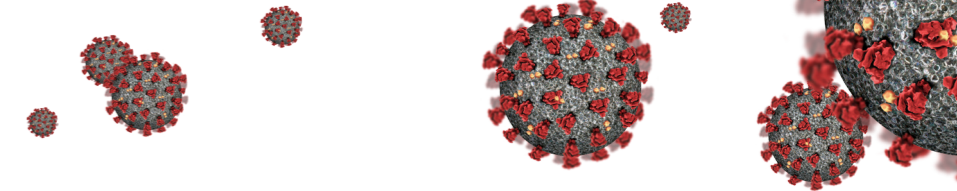
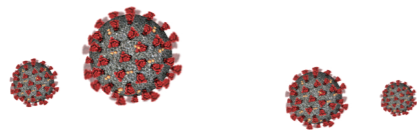
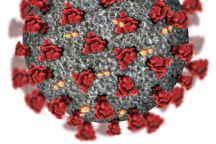
Recommendation 10: A strategic investment programme and promotion should be developed to increase the storage capacity in the country to smooth the demand and supply shocks avoiding any sudden price disruption as well as reducing the food loss and waste as well as in the markets.

- The number and capacity of cold storage units should be increased based on long-term needs assessments to reduce food loss and regulate prices.
- It is crucial to maintain production and investment in crises. Alternative policies could be discussed at ad-hoc meetings in order to find ways to facilitate entrepreneurs' plans for investment in commodity storage units of all kinds.

Recommendation 11: Use of smart technologies in every part of the food systems should be promoted to both increase the efficiency and productivity in the production as well as the resilience of the related parties to ensure sustainability and resource efficiency in the agri-food sector in times of crisis.

- A strategy could be elaborated to help the transformation of the agri-food sector through data and demand-driven smart production methods to ensure sustainability and resource efficiency in the agri-food sector. The ongoing effort of the MoAF to elaborate a National E-Agriculture Strategy for the period of 2021-2025 with technical support of FAO would be a base for developing such planning tool.





- Resource efficiency and sustainable use is also a part of post Pandemic policy frameworks in mitigating the adverse effects of sectoral shocks like COVID-19 and could be prioritized in policies for the transformation of production structures.
- The digital skills of farmers and rural smallholders should be increased through capacity building activities, the design and activation of mobile applications and the dissemination of written materials and tool kits.
- The policy focus should evolve away from short-term and sectoral support towards building conditions favorable for the long-term growth of rural/local economies. A new set of policy prescriptions should be designed to focus on investing in human capital and innovations to maintain crisis management.

Recommendation 12: A policy coordination platform should be established to foster alignments among several parts of the food systems including farmers, food processors, and retailers with the Government and facilitate informed actions and policies to avoid any disruptions in production, supply chains and markets.

6.3. Policy recommendations for agricultural and rural resilience

Recommendation 13: A specific communication and awareness strategy and action plan on emergency risk management should be developed and be an articulated part of the extension services to support the ability of the smallholders` resilience against the pandemic and alike emergencies.

- Training should be conducted, and leaflets should be prepared and distributed, explaining the rules and regulations that farmers, producers and other stakeholders should abide by in crop and livestock production, fisheries, processing, food logistics, marketing and so on.

Recommendation 14: Any farmers/agricultural holders, including fishers and others not registered agri-food producers in Farmer Registry System and the tenants and share-cropper farmers should also be fully covered using a differentiated registry system to be developed in such that Government would be able to provide support in response to any emergencies like COVID-19 pandemic.

- When mandatory curfews are enforced, this will allow participants in agricultural production not on the Farmer Registry (ÇKS) to be exempted from the restrictions as well as farmers on the Registry. They could also be eligible for any support mechanisms introduced by institutions/authorities.
- It is crucial to ensure that tenant and share-cropper farmers are provided with crisis response support at times of shocks/crisis/natural disasters etc. Through the local directorates of the MoAF, a short checklist could be developed and put into use for the evaluation of support applications from farmers who are not registered with the ÇKS but can validate their participation in agricultural production.
- Arrangements should be made for sea fishermen and other neglected farmers/agri-food producers to be able to benefit from the support provided in times of shocks, crises, natural disasters or other similar events.

Recommendation 15: A needs-based capacity development programme for digital skills development of farmers and rural smallholders should be developed to increase their resilience via increasing their opportunity to reach markets, information systems and extension services.

- The initial development of “Agriculture and Forest Academy” for e-Learning and e-training activities during the field study of this Assessment is such a good base to articulate the needs of the aging farmers to the digitalization process.

Recommendation 16: The rural development projects and programmes should be implemented to overcome rural poverty and to maintain sustainability of rural areas during any crisis using the integrated approach of international institutions.

- The integrated approach in internationally funded projects or projects that are led by international agencies for rural development should be scaled up to increase resilience in rural areas during times of crisis.

Recommendation 17: The social protection schemes should be developed to provide in-kind materials including masks and hygiene kits or regular social financial support for most vulnerable groups in rural areas including seasonal agricultural workers (SAWs), aged farmers and woman farmers.

- Although awareness-raising efforts about COVID-19 have been conducted in the first phase of the pandemic, a continuous flow of information should be provided to rural areas as the disease is not yet under control. Masks, disinfectants and similar items should be distributed free of charge to low-income villages.
- For most needy ones who are adversely affected from pandemic conditions can be selected and a regular social financial support can be provided to sustain their ability to produce in the rural areas.

Recommendation 18: An Access and Resilience Strategy and Action Plan for Seasonal Agricultural Workers (ARSAPSAWs) of any origins covering legal regulation as well as social protection should be developed for sustained operation of SAWs both in originating and arriving regions.

- Since foreign workers are an important part of the labor force in the agricultural sector, regulations can be prepared and implemented to ensure that registered foreign workers employed in agriculture are exempted from any movement restrictions.
- During the COVID-19 period, SAWs were exempted from all restrictions. Legal arrangements should be made, particularly with respect to the working conditions of SAWs, to avoid the spread of the disease during agricultural production and to regulate workers` movements during the pandemic.

6.4. Recommendations and their relations with SDGs

The recommendations above can be linked to certain Sustainable Development Goals (SDGs). The SDGs relevant to the current context are listed below. The policy context and the recommended actions to relieve the impacts of COVID-19 can be classified under the following nine SDGs:

- GOAL 1: No Poverty
- GOAL 2: Zero Hunger
- GOAL 3: Good Health and Well-being
- GOAL 5: Gender Equality
- GOAL 8: Decent Work and Economic Growth
- GOAL 9: Industry, Innovation and Infrastructure
- GOAL 10: Reduced Inequality
- GOAL 12: Responsible Consumption and Production
- GOAL 15: Life on Land



The recommendations can be listed among their relations with the relevant SDGs:

Recommendation#	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	5 GENDER EQUALITY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITY	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 LIFE ON LAND
1 - Specific contingency and emergency protocols for Crisis Preparedness, Response and Resilience should be developed.	✓	✓	✓		✓	✓		✓	✓
2 - The fruits and vegetable wholesale markets should be under a differentiated regulation to keep the agri-food supply chains in operation in case of emergencies.	✓	✓		✓	✓			✓	
3 - A statistical monitoring and early warning system of production costs and agri-food supply chain prices should be developed.					✓		✓	✓	
4 - The current monitoring systems of inputs like fertilizers, pesticides or others should be improved to allow strategic stock control and evidence-based policy decisions.		✓			✓		✓	✓	
5 - E-marketing and other short food supply chains tools should be developed and promoted.	✓	✓	✓	✓	✓	✓	✓	✓	
6 - Government support purchasing programmes should be developed and/or the current ones should be differentiated to avoid any possible food loss.	✓	✓	✓	✓	✓	✓		✓	✓
7 - Food banking and other food saving programmes should be promoted to reduce any food waste in the retailing parts of the agri-food supply chain and in mass consumption sites.	✓	✓	✓	✓	✓	✓	✓	✓	
8 - A comprehensive animal disease control and prevention strategy should be laid down and effectively implemented.			✓			✓	✓	✓	
9 - A long term reaching and concerted awareness campaign on biosecurity applications and food safety standards should be prepared and launched.			✓		✓	✓		✓	✓
10 - A strategic investment programme and promotion should be developed to increase the storage capacity in the country to smooth the demand and supply shocks avoiding any sudden price disruption.	✓	✓	✓		✓	✓		✓	✓

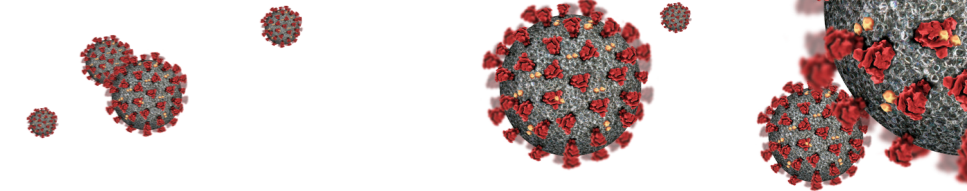
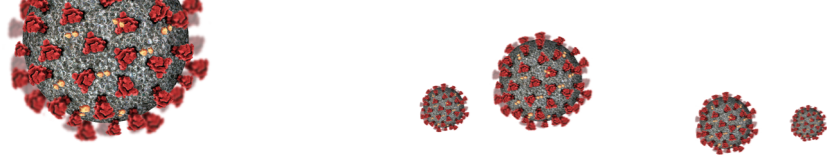
11 - Use of smart technologies in every part of the food systems should be promoted.	✓	✓	✓	✓	✓	✓	✓	✓	✓
12 - A policy coordination platform should be established to foster alignments among several parts of the food systems.	✓	✓	✓	✓	✓	✓	✓	✓	✓
13 - A specific communication and awareness strategy and action plan on emergency risk management should be developed and be an articulated part of the extension services.	✓	✓	✓	✓	✓			✓	✓
14 - Any farmers/agricultural holders not registered in Farmer Registry System should also be fully covered in Government responses to emergencies.	✓	✓		✓	✓			✓	✓
15 - A needs-based capacity development programme for digital skills development of farmers and rural smallholders should be developed.	✓	✓		✓	✓	✓	✓	✓	✓
16 - The rural development projects and programmes should be implemented to overcome rural poverty.	✓	✓		✓	✓	✓	✓	✓	✓
17 - The social protection schemes should be developed to provide in-kind materials including masks and hygiene kits or regular social financial support for most vulnerable groups in rural areas.	✓	✓	✓	✓	✓			✓	✓
18 - An Access and Resilience Strategy and Action Plan for Seasonal Agricultural Workers (ARSAPSAWs) of any origins covering legal regulation as well as social protection should be developed	✓	✓	✓	✓	✓			✓	✓



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ANNEXES

Annex 1 The Epidemiology of COVID-19 and rapid impact on livestock production and animal health

1. THE EPIDEMIOLOGIC SITUATION OF COVID-19

Since December 2019, following the diagnosis of the initial cases in Wuhan, Hubei Province, People's Republic of China (hereafter "China"), the number of cases outside China has increased rapidly and the number of affected countries continues to grow (Figure-1). The WHO declared a global pandemic on March 11, 2020.

An advance team of WHO experts' scientists and the others say exact source "Index case" may never be identified; how, where and when the pathogen was first transmitted to a human could remain a mystery, according to experts. It is demonstrated that SARS CoV-2 possesses 96% nucleotide identity with a bat coronavirus, BetaCoV / RaTG13 /2013 (37). Snakes, Pangolin were originally suspected as a potential source for the outbreak, though other experts have deemed this unlikely and proposed bats instead. As of February 2020, the search for the animal origin of COVID-19 is still ongoing (16).

The pandemic has been ongoing for more than 9 months, the World's continues to be heavily impacted, WHO, JHU and many institutions' websites are resource to help advance the understanding of the virus, inform the public, and brief policymakers in order to guide a response, improve care, and save lives. Also, COVID-19 Situation and Daily Situation Reports of TURKEY is in the website of Ministry of Health of Republic of Turkey.

1.1. Transmission Route in Humans & Animals and Recent Findings to date;

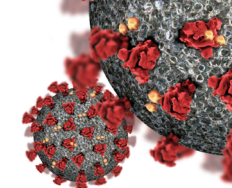
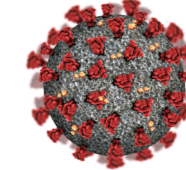
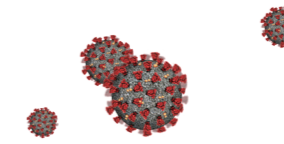
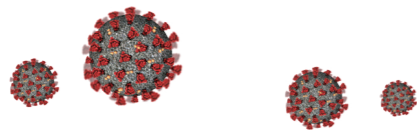
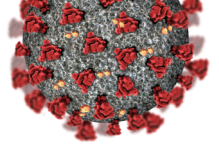
In spite of the fact that some specific animals are thought as origins of the virus, a major accepted transmission routes of COVID-19 are respiratory droplets and contact transmission of human-to-human contact and, to a lesser degree, via contaminated surfaces. Aerosol spread in humans remains unclear. An estimated 48% to 62% of transmission may occur via asymptomatic carriers. The possibility of fecal transmission remains unanswered. WHO continues to emphasize the utmost importance of frequent hand hygiene, face mask, environmental cleaning and disinfection, as well as the importance of maintaining physical distances and avoidance of close, unprotected contact with people with fever or respiratory symptoms (30).

The incubation period in animals appears to be similar to the one seen in humans (i.e. between 2 and 14 days, with a mean duration of 5 days). However, more studies are required to solidly estimate the mean duration of incubation and the infectious periods. Many CoVs and already SARS-CoV-2 have demonstrated a propensity for crossing species barriers, both in animal-to-animal spread and animal-to-human spread.

Latest studies;

- Experimentally SAR-CoV-2 infected hamsters, ferrets and Egyptian fruit bats transmitted infection to naive co-housed animals of the same species in experimental settings.
- Natural SARS-CoV-2 infection in captive tiger and lion in Bronx Zoo in the USA as a result of human-to-animal transmission has been confirmed, with likely onwards animal-to-animal transmission (21).
- Natural SARS-CoV-2 infection in captive farmed mink in the Netherlands as a result of human-to-animal transmission has been confirmed, with likely onwards animal-to-animal and animal-to-human transmission (6) and also in 2 farms in Spain (27).
- There is evidence of coronaviruses such as SARS-CoV-2, Feline Coronavirus (FCoV) and MERS-CoV affecting different species of the same animal family.
- Sustained and robust SARS-CoV-2 replication has been observed in intestinal organoid cultures derived from horseshoe bats (*Rhinolophus sinicus*) of the family Rhinolophidae.





- A high affinity of ACE2 receptors has been found in certain wildlife primates' species "family Cricetidae" to bind RBD of SARS-CoV-2.
- Pangolin coronaviruses have been identified with 92.4 percent full genome sequence similarity to SARS-CoV-2, and 97.4 percent amino acid sequence similarity to SARSCoV-2 RBD supporting the hypothesis that pangolins might host SARS-CoV-2 virus.
- No susceptibility of pigs to SARS-CoV-2 after experimental infection has been demonstrated.

Furthermore, cat sera collected after the outbreak in Wuhan city, Hubei Province were positive for neutralizing antibodies (36). These findings, even though preliminary, have raised concerns about the possibility of humans transmitting the virus to domestic animals, and the potential role that domestic animals could play in the spread of the virus between each other. The list of animal species for which information on natural or experimental infection of COVID-19 is available and it is presented in Table-1.

Table-1: Summary of natural or experimental COVID-19 findings in animals to date				
Species	Infection	Susceptibility None/Low/High	Clinical signs	Transmission
Pigs	Experimental	None	No	No
Poultry (chicken, ducks, and turkeys)	Experimental	None	No	No
Dogs	Natural and experimental	Low	No (possible in some cases)	No
Cats (domestic)	Natural and experimental	High	Yes (none to very mild in some cases)	Yes, between cats
Tigers and Lions	Natural	High	Yes	Yes, between animals
Ferrets	Experimental	High	No (very mild in some cases)	Yes, between ferrets
Minks (American minks, Neovison vison)	Natural	High	Yes	Yes, between minks & suggested from mink to humans
Egyptian fruit bats (Rousettus aegyptiacus)	Experimental	High	No	Yes, between Fruit bats
Golden Syrian hamsters	Experimental	High	Yes (none to very mild in some cases)	Yes, between hamsters
Macaques (Macaca fascicularis and Macaca mulatta)	Experimental	High	Yes	Yes

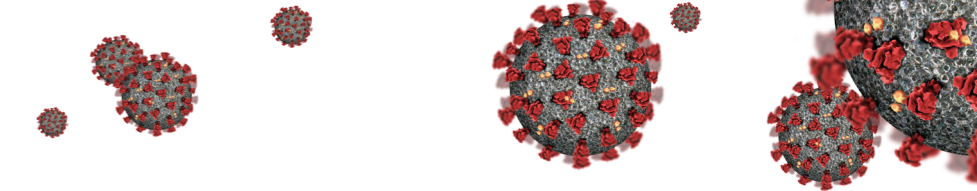
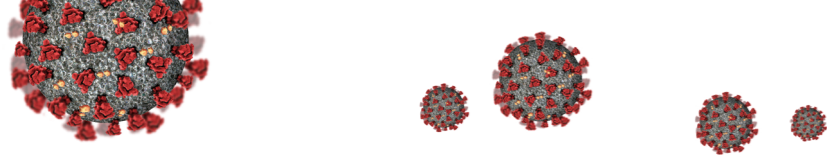
Bayraktar, R. (2020), Collation from internet.

Based on the experimental and natural exposure information gathered to date, infection of dogs and cats is most likely associated with exposure to an infected human. It is not a surprise to find that domestic animals living closely with COVID-19 positive human cases are exposed to the virus, either through environmental contamination, or through human-animal interactions. Positive findings by polymerase chain reaction (PCR) in pets such as dogs (22), (36) and cats from households of COVID-19 patients have been reported. Even so, well-designed epidemiologic studies are needed to further define the role of cats and dogs in this pandemic (8). Public health and animal health entities around the world continue to review the cumulative data on companion animals daily and to update recommendations frequently (4).

According to OIE's Terrestrial Animal Health Code, the infection of animals with SARS-CoV-2 meets the criteria of an emerging disease ("animal" is defined as "a mammal, reptile, bird, or bee"). Therefore, any case of infection of animals with SARS-CoV-2 should be reported to the OIE and include information about the species, diagnostic tests, and relevant epidemiological information. Though minks are farmed and may be traded internationally, the Code does not address specific mink diseases (22). The list of recent information about infected animal species by SARS-Cov-2 is presented in Table-2.

Table-2: Summary of infected animals by SARS-CoV-2 and recent findings							
Date	Country	Species	Infection	Number of infected Farm	Number of Culled Animals	Possible source of infection	Human Transmission
2020-07-24	China Sheung Wan-Hong Kong	Cat	COVID-19	1	-	Infected owner	-
2020-07-16	Netherlands Limburg	farmed mink	COVID-19	5	1.100	Infected equipment, feces, worker	-
2020-07-08	Netherlands North Brabant	farmed mink	COVID-19	2	12.000	Infected equipment, feces, worker	-
2020-07-17	USA South Carolina	Dog	COVID-19	1	1	Infected owner	-
2020-06-08	Netherlands North Brabant	farmed mink	COVID-19	18	850.000	Infected equipment, feces, worker	2 workers in 2 farms
2020-06-08	Denmark North Jutland	farmed mink	COVID-19	125 Farm - 3 Farms +	-	Infected equipment, feces, worker	-
2020-06-03	USA Minnesota	Cat	COVID-19	1	-	Infected owner	1
2020-06-02	USA New York	Dog	COVID-19	2	-	Infected owner	1
2020-05-28	Spain Aragon	farmed mink	COVID-19	1	93.000	Infected owner	7 workers & 1 husband of them in 1 farms
2020-05-26	Russia Moscou	Cat	COVID-19	1	-	Infected owner	-





2020-05-13	Germany Bavaria	Cat	COVID-19	2	-	Infected owner	-
2020-05-11	Spain Gato	tCat	COVID-19	1	-	Infected owner	-
2020-05-02	France	Cat	COVID-19	2	-	Infected owner	-
2020-05-22	USA NY Oregon	Cat	COVID-19	2	-	Infected owner	-
2020-05-26	USA, NY, Bronx	Lion Tiger	COVID-19	3 4	-	Infected zoo employee	-
2020-03-23	Belgium	Cat	COVID-19	2	-	-	-
2020-03-13	Hong Kong Tai Hang	Dog	COVID-19	1	-	Infected owner-?	-
2020-03-19	Hong Kong Pok Fu Lam	Dog	COVID-19	2	-	Infected owner-?	-

Bayraktar, R. (2020), Collation from ProMED-Mail, <http://www.promedmail.org>

All, previously affected companies have all been culled in Netherlands and there is a transport ban for animals and manure, a visitor bans and a hygiene protocol on the farms (23). Most likely, the virus comes from people, it is investigated whether a person has indeed transmitted the virus. This is done on the basis of virus sequences, the sequence of the building blocks of the genetic material. China, Denmark and Poland are the largest mink fur producers across the world. According to the Dutch Federation of Pelt Farmers, there are 140 mink farms in the Netherlands, exporting USD 146 million worth of fur every year. In 2013, the Dutch Parliament had ordered the closure of all mink farms by 2024. Slovenia and Serbia have also passed legislation to ban all fur farming in the country. Countries like Turkey, Norway and the UK have already banned mink farming for fur. The state of California in the US has banned the sale and manufacture of all fur products. The Dutch mink are not the only animals to have been eliminated due to the coronavirus pandemic.

Meat processing plants and hatcheries, across the world, have been forced to kill birds due to shut down and lack of business.

1.2. Epidemiological Strategy and Systems Strengthening

COVID-19 has had a substantial impact on many sectors at global, regional and national levels, including the agriculture and livestock sector. The actions taken in many countries, such as lockdown, travel restrictions and border controls, have resulted in unintended or negative consequences for the agri-food sector, including but not limited to;

- difficulty transferring crops and live animals or animal products like meat, milk, eggs, fish, honey and etc. to markets,
- restricted transhumance, potentially limiting seasonal grazing with ruminants,
- restricted capacity to purchase necessary Agri-food production inputs,
- restricted access to labor and professional services.

These difficulties have led to a decrease in processing capacity for animal products, as well as loss of sales and slowdown of market activity. Therefore, the targeted actions should be taken to rapidly roll-out critical, often additional, response measures and while ensuring continuity of essential services under restricted delivery capacity for Systems Strengthening;

- Contingency and emergency operation procedures should be prepared to mitigate serious impacts of possible delays, coverage challenges, meeting difficulties and insufficient operational

and financial capacities.

- Ensure social protection programs focus more on nutritious foods (increasing access and demand for these foods) and explore the use of food banks through various public and private channels if food insecurity is likely to become extremely severe (7).
- Prioritizing areas that have overlap of COVID-19 and other shocks such as animal and plant diseases, insect infestations and environmental issues
- Ramping up farmer and agribusiness support programs to prevent food market uncertainty:
 - o Monitoring of the food and agricultural input prices e.g., feed and additives, medicines, seeds, fertilizer, for early detection of disruptions and, if disruptions occur, the distributions should be supported
 - o Increasing finance available to farmers and agribusinesses
 - o Supporting the adoption of improved smart technologies
- Strengthen local food purchases of nutritious foods by institutional food/milk buying programs for school feeding, food aid, hospitals, military, etc. (12). Continue and strengthen essential agriculture public goods and services such as:
 - o Agriculture extension services, including farmer digital helplines, with WhatsApp, SMS and etc.
 - o Animal and plant health services to avoid production losses
 - o Designating of domestic farmers and other food system actors as essential frontline workers

Additionally, COVID-19 could undermine the capacities of countries to prevent and control animal diseases. There was a possibility that animal movements caused by Eid al-Adha during this troubled pandemic period were very tight and could not be controlled due to restrictions in working conditions. Turkey has many neighbour countries with animal disease problems and has very long borders with them. The chances of this worst-case scenario happening for Turkey are epidemiologically high and would even create a huge risk.

The aim of this epidemiological guidelines is to describe the impact of COVID-19 on livestock production and animal disease prevention and control, and to provide practical recommendations for actors along value chains to reduce this impact and ensure continuity of the livestock supply chain and animal health. The target beneficiaries of these guideline are decision makers of MoAF and MoH, livestock value chain actors including livestock farmers, slaughterhouse workers, animal product processors, traders, animal health professionals and veterinary paraprofessionals, policy makers and other relevant stakeholders.

1.3. Ecosystems & Wildlife

Ecosystems and Wildlife provide us with natural resources that we depend upon but they have limits. Their collapse seems imminent unless we take immediate action to reorganize our way of life and reframe development in a way that conserves nature and prevents pandemics. A couple of ways we can do this are:

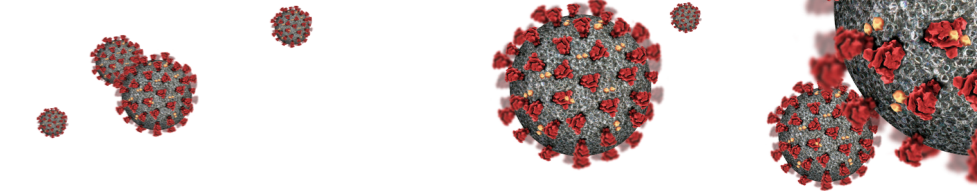
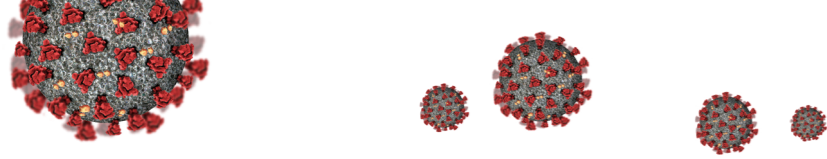
- Strongly decreasing wildlife trafficking and trade, as well as the intensive and poorly managed breeding of wild animals and stopping the spread and transmission of zoonoses.
- Investing in good practices in integrated farming systems, organics and native species production, and local production.

Worldwide efforts must be made to reduce climate change and its unpredictable impact. The efforts to reduce species loss and conserve large in healthy natural areas must be coordinated (31), (11).

1.4. Biosecurity, Cleaning and Disinfection

COVID-19 is potentially highly susceptible to the application of biosecurity measures because it is highly dependent on the actions of people for its spread. Emphasis should be placed on biosecurity which has





a proactive preventive impact and will enable livestock producers to protect their livestock and farms themselves. (See: Annex-1.)

Biosecurity is made up of three components: segregation, cleaning and disinfection. Segregation is the most important phase of biosecurity, even for large commercial livestock units, because it removes the possibility of infection entering a unit. Cleaning will remove most contamination, with disinfection as the final stage to deactivate any remaining virus.

The attributes of different biosecurity measures must be analysed to try and understand which may be appropriate and have the greatest impact for which production system. Recommendations must be practical and sustainable from the point of view of the producers, intermediaries and service providers.

Veterinary, production system, socioeconomics and communication expertise are required if practical and sustainable improvements in biosecurity are to be brought about in many of these, including small-scale commercial producers, animal and animal products transporters, intermediaries and service providers.

In all of these it will be key to work with the stakeholders in a participatory process because success depends on making sure that those who will have to implement biosecurity accept the need and see the benefits of doing so. It will be equally important to monitor uptake and impact of the measures.

Cleaning and disinfection; it should be known that it is impossible to disinfect a dirty object.

They must be thoroughly cleaned first.

- First clean and then disinfect. You can't expect something dirty to disinfect.
- Cleaning requires effort.
- Use pathogen-specific disinfectants where possible (Table-3).
- The efficacy of disinfectants depends on several factors, including: ambient temperature, contact time, clean of surface, etc.
- DRYING is then required, at least leaving the clean and disinfected material to dry on its own overnight.
- Keep CLEAN after disinfection. This is as important as cleaning and disinfection.
- Very contaminated objects can remain contaminated even after virus has been removed by 99%, so cleaning and disinfection must be REPEATED as much as possible.
- Special considerations for transporting animals' vehicles,
 - o All vehicles used for transporting animals, their products or by-products or contaminated equipment have the potential to spread disease.
 - o Vehicle, wheels
 - o Vehicles allowed to enter farms should be limited and when possible unload outside the farm.
 - o High pressure sprayer- help to clean wood pores, cracks and crevices.
 - o Low pressure sprayer - allow its proper contact time to elapse.
- Special considerations for foot baths in livestock and food sector,

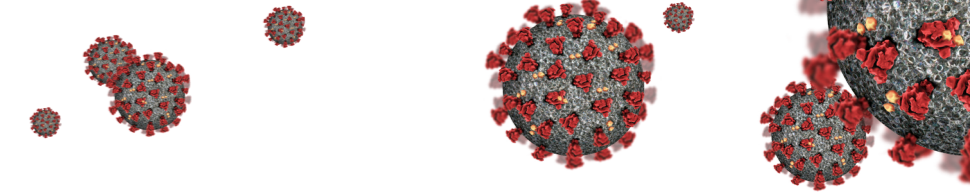
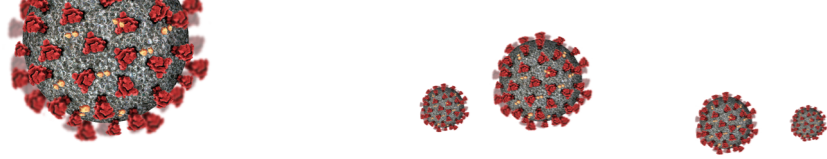
Common problems

- o Inadequate removal of organic debris
- o Inappropriate contact time
- o Infrequent change of solution.
- o Can lead to a false sense of security.
- o Boots should be scrubbed and cleaned of all grossly visible debris prior to a timed soak in the disinfectant, should be refilled at least every 2-3 days. For best results, it should be replaced daily / depend on the degree of traffic flow.



Table-3: Disinfectants known to be effective against SARS-CoV-2 to date		
Type of Product	Best for	Dilution
Ethanol	Broad-spectrum Denatures proteins = cell lysis	70% at least Rapid evaporation, Flammable, Limited virucidal activity and ineffective against
Aldehydes	Broad-spectrum = bacteria, fungi, viruses, mycobacteria and spores	2,5 - 4,5% Non-corrosive to metals, rubber, plastic and cement, Active in the presence of organic matter, soaps and hard water
Sodium hypochlorite	High level disinfection and cleaning	Chlorine compounds are rapidly inactivated by light and some metals so fresh solutions should always be used Depends on the area of use; 60-10,000 ppm. General use; 0.1% sodium hypochlorite, which can be made by 1:50 dilution of household bleach
Hydrogen peroxide	Cleaning water lines	3% - Damaging to some metals
Peracetic acid-based	Cleaning water lines	3% - Damaging to some metals
Povidone iodine	Broad spectrum compounds, Surface cleaning, Low toxicity, low cost	0.5% lose activity quickly in the presence of organic debris, sunlight and some metals, they must be applied to thoroughly cleaned surfaces for disinfection.
Chlorocresol-based	Disinfectant and Antiseptic, Human Skin hygiene,	0.25-4 % Antiseptic, Light sensitive
Phenols	General biocidal products, Good efficacy with organic material, Non-corrosive, Have residual activity	0.5-1% Phenolic disinfectants are generally safe for humans but prolonged exposure to the skin may cause irritation. Concentrations over 2% are highly toxic to all animals, especially cats.

Bayraktar, R. (2020) It is compiled from OIE, WHO and FAO web pages.



The large-scale production capacity of veterinary medicine producers can make a real difference at this pandemic time and help to solve the hand sanitiser and surface disinfectant shortage in the healthcare sector.

1.5. Vaccines and Vaccines Development in Turkey

SARS-CoV-2 vaccines are not yet available, and there is no currently specific treatment available for COVID-19. While an efficacious antiviral or vaccine is not currently available for Coronavirus, this may change over the medium term with international efforts.

The Risk of Resurgence or New Wave of Infections; It is unknown how effective the body's immune response is in conferring long-term immunity, there is no guarantee that recovering from the disease once will prevent people from getting it a second time.

In addition, Private Agriculture and Veterinary medicine and Private Human medicine diagnostic and research companies can contribute to the fight against COVID-19 and to conduct large-scale tests for virus diagnosis.

Situation of vaccine production in Turkey; Turkey was self-sufficient and even had an export capacity until the 2000s, but the vaccines, biologicals and diagnostic kits for both production and R&D capacity is very low at present. Human vaccines have completely, veterinary vaccines have partially and biological substances and diagnostic kits have become completely import-dependent, since it was announced that vaccine production institutions were closed as they were privatized; however, although they were closed in 1980 due to that reason, without privatization. Currently, about 60% of vaccines used in human health in Turkey is imported by the Ministry of Health, 30% of the vaccines is imported by the private sector while 10% is provided as a donation. The main reasons of the current situation are;

- The modernization costs of vaccine production institutions are much higher than vaccine imports and vaccine and biological substance production is not seen as a public responsibility,
- Only the profit and loss calculation were made in the evaluation analysis and the import was focused on the reason that it was evaluated only in economic aspects.
- Developments in biotechnology have not been sufficiently monitored and necessary new investments have not been made,

While researches are underway in Turkey in the current pandemic period, the private companies and vaccine production and animal diseases diagnostic laboratories of Ministry of Agriculture and Forestry can provide to laboratories with necessary equipment, laboratory materials and personal protective equipment for production if the vaccine production is succeeded.

MoAF has big group of microbiologists, virologists and geneticists' researchers from Agriculture and Veterinary Research Institutes, all volunteers with experience working on a daily basis using molecular methods with infectious materials, would directly participate in the work of the research team. The facilities contain the most up-to-date equipment and apparatus for vaccine production, diagnostics production and PCR analysis for disease detection. This type of real-time diagnosis allows hundreds of samples to be analysed in few hours, backed up by the automation of the process.

1.6. The National Zoonotic Committee of Turkey

The National Zoonotic Committee of Turkey- NZCT was established under a protocol signed on 11/11/1991 by the Ministry of Health and the Ministry of Agriculture and Rural Affairs aimed at ensuring efficient cooperation between both Ministries in fighting zoonotic diseases like rabies, brucellosis, salmonellosis, which are very critical for both human and animal health, and taking the necessary preventive measures. The Secretariat functions of the NZCT are carried out by MoH and MoAF according to situation of pandemic and NZCT Secretariat is transferable between ministries in accordance with the protocol, it is said.

NZCT worked very successfully during the "Avian Flu pandemic" of 2005-2009 and many successful projects were carried out with the World Bank, the FAO and the EU. Within the framework of these projects, epidemiological field studies, joint technical trainings, public awareness raising, communications, etc. activities were conducted. Technical epidemiological studies have been conducted in the field by the FAO.

With the financial assistance provided by WB and these projects, a total of 4 Biosecurity Level-3 "BSL-3" laboratories were built, 1 lab. in Ankara for the Ministry of Health and 3 labs. in Ankara, Izmir and Istanbul for the MoAF with BSL-3. In addition, 1 vaccine storage and logistics building were constructed for the Ministry of Health. In addition, detailed EU technical reports have been prepared to raise the safety levels of diagnostic laboratories at 5 Veterinary Research Institutes of the Ministry of Agriculture to the level of BSL-2 as part of the EU project.

NZCT was re-established in 2019 under the leadership of MoAF and MoH in order to ensure cooperation between different institutions and sectors with the ultimate goal of reducing the prevalence of zoonotic diseases and improve the quality of life of the society in Turkey and the 'Turkey Zoonotic Diseases Action Plan 2019-2023' was prepared accordingly. The action plan is focused on zoonotic diseases and pandemic that are public health problems of Turkey. Therefore, NZCT should be run for COVID-19 pandemic.

1.7. Multi Sectoral Information and Communication Channels Development

The interconnectivity of humans, animals and the environment are important in understanding and tackling any threats to food systems, agricultural production and livelihoods. This is particularly important in rural livestock farming communities where animals play an important role for society and food security because of providing, income, transport, fuel and clothing as well as food. Embracing this challenge, OIE, WHO and FAO recommend a One Health approach, where animal, human and environmental health work together to achieve the best results. One Health aims to improve health and well-being through the mitigation of risks and crisis that originate at the interface between humans, animals, and their various environments.

a. Information and Communication Preparedness

Activities would include developing and testing communication messages and materials to be used in the event of a pandemic or emerging infectious disease outbreaks and enhancing infrastructures to disseminate information from national to state and local levels and between the public and private sectors. Communication activities would support cost effective and sustainable methods such as marketing of "face mask", "handwashing", "social distancing measures" through various communication channels via mass media, counselling, schools, workplace, and integrated into specific interventions. Support would also include ongoing outreach activities of ministries and sectors, especially ministries of health, education, agriculture, and transport. Further, support would be provided for;

- information and communication activities to increase the attention and commitment of government, private sector, and civil society; and
- to raise awareness, knowledge and understanding among the general population
- about the risk and potential impact of the pandemic and to develop multi-sectoral strategies to address it. In the countries experiences, community mobilization would take place through institutions that reach the local population, especially in rural areas (e.g., church and tribal leaders).
- In addition, support would be provided for the development and distribution of basic communication materials, such as question & answer sheets and fact sheets on COVID-19 and general preventive measures such as "dos" and "don'ts" for the general public;
- information and guidelines for health care providers:
 - o training modules (web-based, printed, and video),
 - o presentations, slide sets, videos, and documentaries.

b. Multi-Sectoral Use of Communication Channels

- Maximize the use of digital tools to improve agriculture and food logistics and communication regarding:
 - o access to food markets (home deliveries, time for market openings, food availability



- o recommendations for appropriate food hygiene, handling and cooking
- o messages on nutrition and diet

- Maximize the use of health- sector digital communication tools to communicate the importance of nutritional vulnerability and key protective nutrition behaviours.

c. Information and Inspection Systems for Agri-food & livestock

- The best use of existing information and surveillance systems across Agri-food & livestock sectors, including food price monitoring and food consumption data should be identified and supported for the food insecure communities and families, chronically ill elderly, elderly care institutions, child protection institutions,
- Support the use of information systems cross-sectoral for proper targeting of those most vulnerable to health, food and economic impacts,
- Improve monitoring of food prices, food stocks, and markets,
- Enhance food safety labs, in particular mobile inspections, to ensure food quality across new food distribution points and markets.

1.8. Using Artificial Intelligence to Detect, Respond and Recover from COVID-19

With COVID-19 becoming a global pandemic, AI tools and techniques can help policymakers and the medical community understand the COVID-19 virus and accelerate research on treatments by rapidly analysing large volumes of research data. (19). Today, AI technologies and tools play a key role in every aspect of the COVID-19 crisis response:

- Detecting and diagnosing the virus and predicting its evolution,
- Understanding the genetics and molecular structure of virus and accelerating medical research on drugs and treatments,
- Assisting in preventing or slowing the virus' spread through surveillance and contact tracing, monitoring the recovery and improving early warning tools,
- Responding to the health crisis through personalized information and learning,
- Deep learning models can help predict old and new drugs or treatments that might treat COVID-19. Several institutions use AI to identify treatments and develop prototype vaccines. For example, DeepMind and several other organisations use deep learning to predict the structure of proteins associated with SARS-CoV-2, the virus that causes COVID-19,
- Dedicated platforms or forums allow the consolidation and sharing of multidisciplinary expertise on AI, including internationally. The US government for example has initiated a dialogue with international government science leaders that includes using AI to accelerate analysis of coronavirus literature made available using the Kaggle platform,
- Access to datasets in epidemiology, bioinformatics and molecular modelling is being provided, e.g. through the COVID-19 Open Research Dataset Challenge by the US government and partner organisations that makes available over 29 000 academic research articles for coronavirus and COVID-19,
- Access to datasets in epidemiology, bioinformatics and molecular modelling is being provided, e.g. through the by the US government and partner organisations that makes available over 29 000 academic research articles for coronavirus and COVID-19.
- Computing power for AI is also being made available by technology companies such as IBM, Amazon, Google and Microsoft; individuals donating computer processing power (e.g. Folding@home); and by public-private efforts like the COVID-19 High Performance Computing Consortium and AI for Health.

- Innovative approaches including prizes, open-source collaborations, and hackathons, help accelerate research on AI-driven solutions to the pandemic. For example, the United Kingdom's "CoronaHack – AI vs. Covid-19" seeks ideas from businesses, data scientists and biomedical researchers on using AI to control and manage the pandemic.

- The European Commission has launched the European Research Area (ERA) corona platform, a one-stop shop for information on coronavirus research and innovation funding, e.g., calls, funded projects, etc. The platform also includes a dedicated area for national activities.

- In France, the REACTing consortium is a multi-disciplinary collaborative network of French research institutions with the dual mission to increase research preparedness for future epidemics and coordinate research during epidemics. It notably monitors and encourages data sharing, promotes good practices and standardisation of data collection, and co-ordinates and brings together the French research actors on COVID-19.

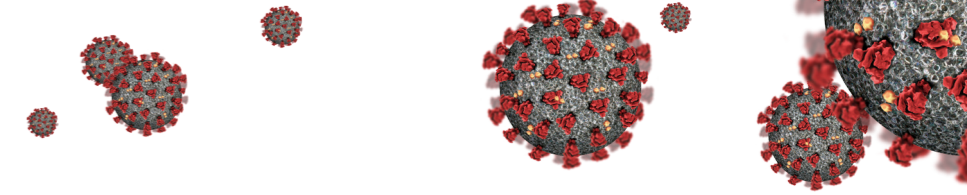
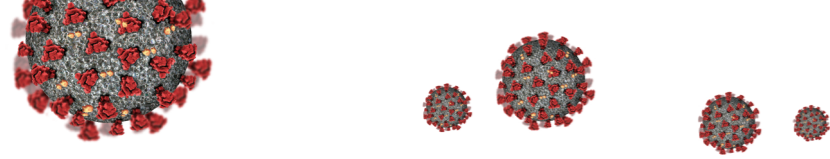
- In Luxemburg, the Fonds national de la recherche (FNR) has partnered with leading research institutions to launch a national COVID-19 platform. The platform allows researchers to submit new project ideas, browse and discuss ongoing projects and proposals, and review the latest COVID-19 literature.

- In Portugal, the Foundation for Science and Technology and the Agency for Clinical Research and Biomedical Innovation partnered with public and private health authorities and scientific research institutions to develop the "Science 4 Covid-19" portal. The portal brings together ideas, publications, funding opportunities and other ongoing actions, as well as information on relevant research capacity.

- In the United States, the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) public-private partnership aims to develop a co-ordinated research strategy to prioritise and speed development of the most promising treatments and vaccines.

Finally, AI tools can help monitor the economic crisis and the recovery – for example, via satellite, social networking and other data (e.g. Google's Community Mobility Reports) – and can learn from the crisis and build early warning for future outbreaks.





2. RECOMMENDATIONS FOR SUPPLY CHAIN, FOOD SAFETY, LIVESTOCK PRODUCTION AND ANIMAL HEALTH

2.1. Recommendations for the Livestock Supply Chain and Food Safety

To mitigate the impact of COVID-19 and ensure continuity of the livestock supply chain and animal health activities, practical recommendations are given and mandatory precautionary measures are taken.

To avoid human-to-human transmission and prevent surface contamination including animal surfaces, it is recommended to strengthen hygiene practices, including:

- washing hands with soap and water (32);
- using hand sanitizers before and after entering farm areas and common places or having contact with animals;
- maintaining physical distancing;
- limiting physical interaction;
- wearing necessary PPE (33); and
- avoiding overwork (37).

Due to increased pressure and stress, physical and mental health issues are one of the main concerns for people working in the livestock value chain. Therefore, it is recommended to become familiar with early detection of signs of mental health difficulties and to identify existing mental health services in the community that understand the occupational stressors that farmers and veterinary personnel are facing. Early interventions should be made to provide practical and emotional support.

Considering the challenges posed by COVID-19 and the experiences throughout livestock supply chains and regarding animal diseases observed around the world, measures of MoAF regarding COVID-19 have been published on the MoAF web page, <https://www.tarimorman.gov.tr/Sayfalar/Detay.aspx?Sayfald=52> taking into account the information and recommendations of the MoH. These are:

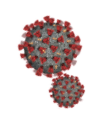
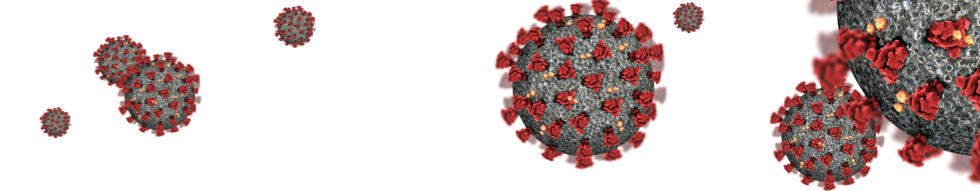
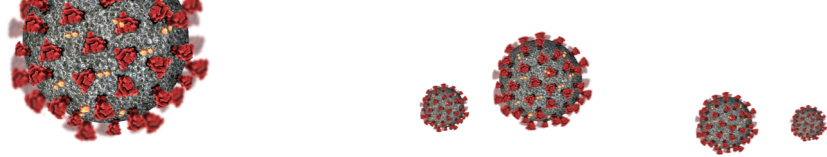
- Public spotlight
- Coronavirus measures for farmers
- Coronavirus measures to be taken in the fields
- Coronavirus measures to be taken in livestock farms
- Coronavirus measures to be taken in food business
- Coronavirus measures to be applied in poultry farms
- Coronavirus measures to be taken in greenhouses
- Coronavirus measures to be taken in slaughterhouses and cutting places
- Coronavirus measures to be taken in oven and bakery production facilities
- Coronavirus precautions that veterinarians should take

2.2. Recommendations for Livestock Farmers

The COVID-19 measurements of MoAF regarding for livestock farmers have been published on the MoAF web page, taking into account the information and recommendations of the Ministry of Health. Additionally, the following recommendations are laid down in further details;

- 1) Obtain the latest information on the evolving COVID-19 situation from trusted sources e.g. official news releases, radio programs provided by local governments, veterinary officers, veterinary pharmacies, livestock market officers, livestock NGOs and farmers associations.
- 2) Communicate through producer cooperatives, farmers associations or unions to reach out to decision makers regarding assistance, as well as obtaining necessary exemptions for mobilization of animals, products and personnel.
- 3) Communicate with suppliers, e.g. feed, consumables, etc. and professional service providers, e.g. veterinarians, mechanics, milk collectors, etc. to find solutions to secure supplies, inputs and services.
- 4) Explore alternative sales channels. These include online sales, e-commerce and direct sales using point-to-point transportation to deliver livestock and their products to buyers instead of via retailers or markets.
- 5) Implement practical biosafety and biosecurity measures to prevent human contamination with COVID-19 on the farm:
 - a. Install footbaths in between different areas if possible, and change the disinfectant frequently.
 - b. Maintain a designated area for all external visitors and restrict visitor interactions with farm workers and operations to essential activities. Using PPE plays two roles in the COVID-19 pandemic: it protects wearers and prevents carrying contaminated material to other places. Different products have different protection capacity. Particular attention should be paid not to contaminate bare hands when removing PPE by touching outer surface of respirator or gloves. Follow instructions provided by WHO especially how to safely remove PPE (40).
 - c. Limit visitors to minimum essential (e.g. animal health workers, feed truck drivers, milk collectors) and keep records. Ensure that visitors follow physical distancing and other hygiene recommendations.
 - d. Anyone (including farmers and farm workers) with fever and other symptoms of COVID-19 (whether confirmed or suspected), people who have tested positive for SARS-CoV-2 (including asymptomatic or recovering persons), and people in an isolation period due to close contact history with COVID-19 patients, should avoid or minimize close contact/work with animals, until recovered and cleared by medical providers.
 - e. Routinely clean and disinfect common areas e.g. resting areas, kitchens, changing rooms, bathrooms, sleeping quarters (refer to 1.2.9.).
 - f. Control interactions/socialization of people inside the farm, e.g. around the TV or resting areas, to ensure physical distancing and other recommendations are followed.
 - g. Disinfect equipment and other materials as they come onto the farm and at periodic intervals. Limit the introduction of personal items to the farm.
 - h. Change clothes and footwear between livestock areas and living areas, or at least put on work wear (e.g. coveralls) and change footwear to reduce cross contamination.
 - i. Maintain general hygiene of the premises where the animals are kept (e.g. prevent rodents and vermin) to avoid contamination.
 - j. Consult with animal health professionals to improve biosecurity and biosafety on the farm.
- 6) Adjust management measures on the farm:
 - a. Raise awareness among farm workers about how COVID-19 spreads and how to prevent getting





infected, and routinely remind them about biosafety and biosecurity measures against COVID-19 on the farm.

b. For large farms

- Stagger arrival of workers to the farm, screen body temperature and typical clinical symptoms before entering the farm.
- Frequently clean and disinfect common spaces including workers' break rooms, dining rooms, and bathrooms (refer to 1.2.9).
- Change the settings, e.g. add barriers in common places, e.g. break rooms for farm workers to maintain physical distancing. Stagger mealtimes to avoid large gatherings in the break rooms.
- Prepare for shortage of workforce and develop a contingency plan.

c. For medium and smaller producers

- Avoid contact or apply physical distancing outside the farm so you do not get sick and have to leave your animals alone.
- Identify a substitute person/people that could take care of your animals at short notice in case you become indisposed or to involve in finding the supplies and resources needed to maintain production.

7) Maintain animal disease prevention at farm level:

- a. Maintain good animal husbandry and production practices as much as possible (e.g. milking hygiene).
- b. Make best efforts to ensure continuation of sanitary programs for the farm animals as planned, including vaccination, vector control and deworming.
- c. Implement good biosecurity practices, including routinely cleaning and disinfecting barns, pens, rooms, and other facilities to reduce the pathogen loads.
- d. Seek advice from veterinarians and livestock husbandry specialists when needed

8) At the moment there's no evidence of coronavirus circulating in pets or other animals in Turkey, and there's nothing to suggest animals may transmit the disease to humans. In line with general advice on fighting coronavirus.

If farmers do not have symptoms of COVID-19;

- You may leave your house to exercise once a day, and you should combine this leaving to provide care for your horse or livestock.
- It is essential that you minimise the time spent outside of the home and remain 2 meters away from others.
- You should remember to wash your hands before and after contact with any animals.
- Keep your companion animals with you if you self-quarantined.
- Contact your veterinarian immediately if you have questions or concerns.
- Arrange for the care of any animals left at home with family or friends should you be hospitalized.

If farmers have symptoms of COVID-19 and must remain at home for 7 days, or 14 days as a household;

- If you have livestock such as cattle, sheep, goats, pigs, poultry, or any other types of livestock, you should arrange for someone else or your workers who is not self-isolating to care for your animals.

- If you have a horse in livery, you must not visit them whilst you are self-isolating. You should contact your yard manager or vet to make suitable welfare arrangements.
- Where this is not possible, you should ensure the basic needs of your animals are met. You must make sure you wash your hands before and after handling your animals, and ensure you remain 2 metres away from other people.

The basic information should be taken for dogs, cat, horses, livestock and other animals' owners and keepers of livestock on maintaining the welfare of their animals during the current COVID-19 outbreak. For more detailed information can be visited e.g. the [Middlesbrough.gov.uk](https://www.middlesbrough.gov.uk), [WSAVA.org](https://www.wsva.org) and [Global Veterinary Community websites](https://www.globalveterinarycommunity.com).

2.3. Recommendations for Veterinarians and Animal Health Technicians

The COVID-19 measurements of MoAF regarding for veterinarians have been prepared in detail and published on the MoAF web page, taking into account the information and recommendations of the Ministry of Health, Additionally, the following recommendations are also given in further details below;

1) Implement personal biosafety and biosecurity measures along with general hygiene practices for COVID-19 recommended by OIE and WHO:

- a. Do not visit farms, herds, markets or animal product processing facilities if you have any symptoms of COVID-19, or if you are confirmed positive and have not yet recovered/been cleared by medical providers following the isolation period.
- b. Carry soap, alcohol-based hand sanitizer, disinfectant and PPE when visiting farms and other livestock related facilities without relying on availability at the farm
- c. Make sure you and the farms are using disinfectants that are known to be effective against SARS-CoV-2 (Refer to 1.2.9).
- d. Maintain physical distancing with farmers and workers when you interact with them and follow other hygiene recommendations.

2) Keep up to date with reliable information and sensitize farmers on required behaviour changes.

- a. Help farmers to review and adjust biosecurity practices, such as cleaning and disinfection, based on the need and the availability of resources.
- b. Help farmers to identify the most relevant priorities and functions regarding prevention of diseases, that can be performed with minimum personnel.
- c. Help farmers to review and adjust production management with the supplies, equipment and personnel available to them.

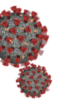
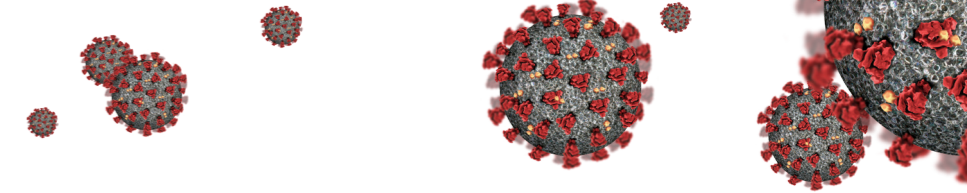
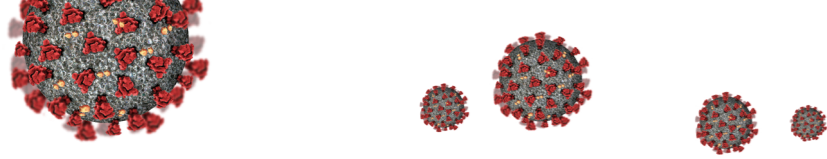
3) Assist animal disease prevention and control at field level:

- a. Advise farmers on good livestock husbandry practices to mitigate the risk of disease outbreaks on farms.
- b. Communication and awareness should be strengthened with livestock farmers and live animal markets if the markets are open.
- c. Request farmers and markets to continue reporting disease outbreaks and animal deaths of unknown reason to veterinary offices even when lockdown or curfew is in place.
- d. Assist in contingency planning for livestock production, livestock markets and processing facilities.

4) Secure supplies, inputs and services:

- a. Animal health activities are in the essential business category in Turkey. Where lockdown or curfew is in place, apply for the exemption for essential businesses.
- b. Contact suppliers of veterinary drugs and consumables and professional services and diagnostic laboratories regarding availability and possible delay in delivery.





c. Manage the essential consumables you have in stock, including syringes, tubes, disinfectants and PPE. Be familiar with the correct disinfection procedure of reusable veterinary equipment such as needles, syringes and surgical instruments to help with limited supply.

5) Contingency and/or emergency plan: If there is no a contingency plan prepared by the MoAF, prepare your own contingency and/or emergency action plan according to OIE catalogue.

a. Maintain biosafety and biosecurity action plan and measures, PPEs, disinfectants and disinfection equipment and plan for transportation.

b. Maintain an inventory of medicines, drugs, diagnostic tests, supplies and equipment.

c. Ensure information and communication technology-ICT is in place for giving animal health advice: e.g. telephone and messaging services.

d. Familiarize yourself with the latest national laws and regulations regarding online veterinary consultation or telemedicine during the COVID-19 pandemic.

2.4. Recommendations for Livestock Processing Plants, Live Animal Markets and Related Supply Chains

The COVID-19 measurements of MoAF regarding for livestock farms and food business have been published on the MoAF web page, taking into account the information and recommendations of the Ministry of Health. Additionally, a set of recommendations for animal product processing plants, livestock animal markets and related supply chains are given in further details below;

1) Secure supplies, inputs and services and keep updated with reliable information (refer to 1.3.2.3).

2) Implement biosafety and biosecurity measures against COVID-19 to protect people working at the facility, including increasing air ventilation.

3) Following the measures for food processing facility workers, food delivery and transport, and food retail premises as detailed in the WHO & FAO Interim Guidance, COVID-19 and food safety: guidance for food businesses (29).

4) Follow biosafety and biosecurity measures to prevent contamination of the environment by COVID-19:

a. Disinfect reusable PPE items after every use, using appropriate disinfectant (refer to 1.2.9).

b. Maintain general cleanliness of the premises and periodically disinfect the facilities.

c. Limit visitors to the processing environment.

d. Keep records of movement of people including workers, visitors and suppliers.

5) Adjust management measures to decrease the risk of introduction and spread of COVID-19 in the facilities:

a. Stagger workers entering or leaving the premises.

b. Stagger mealtimes and break times to avoid large gatherings in break rooms and dining rooms.

c. Consider screening individual temperatures and typical COVID-19 symptoms before entering the facilities. When possible, provide access to medical personnel, e.g. nurse for the workers.

d. Provide guidance to clean and disinfect the work environment before and after shifts, including shared spaces, employee break rooms, dining rooms, sleeping quarters, bathrooms and company transportation services

e. Prepare for shortages in the workforce. Develop an alternative plan to manage the facility with fewer workers, adjusting work arrangements in case some of the workers become infected or are isolating due to COVID-19. Implement cross-training as much as possible.

f. If possible, review and adjust the sick leave policy of employees and encourage self-reporting of illness.

6) Recommended actions for animal disease prevention at live animal markets and by traders and Rules

for buyers and vendors in Livestock auction markets;

7) The sale conditions of animal markets need to be regulated for doing safely due to the COVID-19 pandemic. For this reason, guides prepared for animal markets in EU countries and some institutions (e.g., LAA, DEFRA, etc.) have been reviewed and a sample guide has been prepared.

a. Official Veterinary authority will ensure that the highest hygiene prevention measures are in market place and will keep market area clean and regularly disinfected (refer to 1.2.9).

b. Buyers will be asked to use face masks and sterilize hands and boots at entry and exit to the market and will be provided by the management.

c. The management must enforce buyer restrictions to comply with the 2 meters social distance in markets.

d. All purchasers must register with the market and only 'known' purchasers will be given access to the market.

e. Markets will keep a register of those that attend their sales; contact name, address and telephone number.

f. All cafes, mobile units etc. WILL be closed and all potential 'gathering' points WILL be prevented.

g. At the conclusion of the sale buyers will be asked to enter the sales office in a way that does not result in too many entering at any one time.

h. Vendors will be asked to disinfect the vehicles at entry and exit to the market and will be provided by the market management.

i. Markets will implement a 'drop and go' policy for vendors to prevent any sellers from entering the market.

j. Vendors MUST remain in their vehicles when they arrive at the market, the market staff will unload the vehicle at the loading dock, and the vendors vehicle must then leave the market site immediately.

k. The sale documentation will be collected by the market staff from the vendor's vehicle when they arrive at the unloading docks – vendors MUST NOT take the paperwork to the markets' office, or enter the market pennant/sales area for any reason.

l. The management will try not to let animals stay overnight in live markets even in the case that lockdown or curfew is imposed.

8) If there is no a contingency and/or emergency action plan prepared by the MoAF, prepare your own contingency/emergency action plan according to OIE and WHO catalogue.

a. Identify alternative suppliers or inputs in case the main supply-chain is disrupted.

b. If possible, seek exemption of movement restrictions to contribute to ensuring stable basic food supply for national food security and nutrition.

c. Strengthen control of movement of people including workers, visitors and suppliers

d. Review and adjust waste and litter management plans.

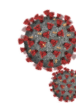
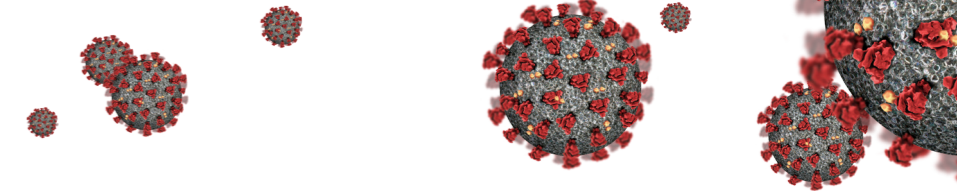
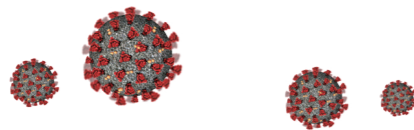
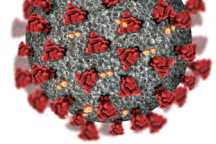
2.5. Recommendations for Animal Health Policy Makers at National Level

1) The policies should be developed, endorsed and implemented to mitigate impact of COVID-19 on livestock production and value chains:

a. Ensure availability and flow of the normal inputs and outputs for livestock production, for example by releasing a list of exemptions to movement restrictions.

b. If possible, review and adapt existing biosafety and biosecurity measures to the COVID-19 situation and provide these as a checklist for farms, livestock product processing facilities, live animal markets, slaughterhouses and related value chains.





- c. Include veterinary services as essential businesses.
 - d. Ensure a functioning supply chain of livestock and animal products:
 - Governments may release and broadly publicize a list of exemptions to movement restrictions to ensure the flow of food materials and production related services. The information on exemption should be shared with the relevant stakeholders using various channels such as mass media, interest groups or associations.
 - Governments may work with farmers and producer organizations to promote collective marketing which can maintain demand for products. Governments may promote e-commerce to help connect rural producers to urban consumers.
 - Governments may coordinate with NGOs and suppliers to purchase products and redistribute them, possibly through food banks, religious charitable organizations or international emergency and relief organizations (e.g. UNICEF, UNHCR, etc.).
 - e. Plan to strengthen resilience of the national food system.
- 2) Review, revise, endorse, and implement policies on animal disease prevention and control:
- a. Prioritize animal diseases, in consultation with the field veterinarians and other key stakeholders to support maintenance of essential monitoring, prevention and control programs.
 - b. Continue monitoring, prevention and control of transboundary animal diseases by maintaining surveillance, outbreak investigation, laboratory diagnosis and early response capacities.
 - c. Review and update biosecurity and biosafety requirements and disseminate them widely to farmers, livestock and live animal markets, slaughterhouses and animal health professionals
 - d. Maintain the capacity of national reference laboratories to support surveillance, diagnosis, early detection and response to outbreaks.
 - e. In case veterinary laboratories are needed to support the public health sector in testing human specimens for COVID-19, the additional activities should not disrupt any surveillance and routine diagnosis of animal diseases. Please refer to OIE Guidance on Veterinary Laboratory Support to the Public Health Response for COVID-19 (OIE, 1 April 2020) for further information.
 - f. If possible, develop a specific contingency plan for access to veterinary services for remote or rural smallholders.
 - g. Introduce/maintain ICT including online platforms, to facilitate livestock farmers contacting veterinarians and livestock husbandry consultants in order to obtain advice.
 - h. Encourage veterinary services to continue supporting farmers, including real-time communication using technologies such as short messaging services (SMS), social networking services (SNS), etc.
- 3) Develop and disseminate information materials and collaborate with partners to organize outreach activities, in order to sensitize livestock production and animal health stakeholders, including relevant recommendations in this document:
- a. Develop a series of communication materials and widely distribute through media, field staff and other communication channels, with the advice of stakeholders. Materials also can be made available through smartphone-friendly graphics and apps.
 - b. Strengthen coordination and collaboration among all relevant sectors including transport industry, markets and media, to assist flow of information from reliable sources. This will help stabilize availability and price of basic food and reduce disruption of livestock production and animal disease control and prevention, in the context of the COVID-19 pandemic

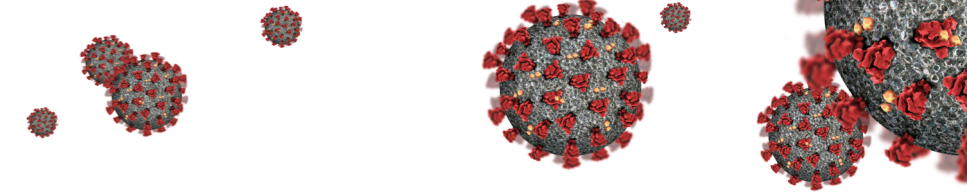
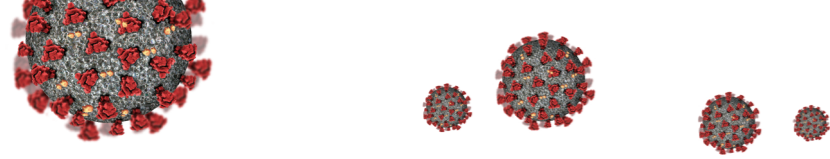
Limitations

This review has several limitations. First, information provided here is based on current evidence, but may be modified as more information becomes available. Second, information and official data regarding COVID-19 is limited.

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Annex 2 Tables and Figures

Annex 2 Table 1 Number of Stakeholders as to Product groups

Product	Number of Stakeholders
Cereal	26 institutions/organizations and 10 farmers
Legumes	21 institutions/organizations and 6 farmers
Oil Crops	22 institutions/organizations and 8 farmers
Tuber Plants	15 institutions/organizations and 7 farmers
Fresh fruits	33 institutions/organizations and 22 farmers
Fersh vegetables	28 institutions/organizations and 18 farmers
Dairy cattle and dairy processing	23 institutions/organizations and 10 farmers
Cattle, red meat production and processing	5 institutions/organizations and 6 farmers
Poultry and eggs	3 institutions/organizations and 1 farmer
Honey production and processing	2 institutions/organizations and 1 farmer
Fisheries	3 institutions/organizations
Feed and additive products	3 institutions / organizations

Annex 2 Table 2 Key Characteristics of Stakeholders

Key characteristics	Mean
Age	45.5
Public Institutions	47.2
Private sector	45.4
Education	%
Input Providers	
Primary/Secondary school	5.9
High school	17.6
University	76.5
Industry	
Primary/Secondary school	14,3
High school	42,9
University	42,8
Wholesale Fresh Fruits and Veggies	
Primary/Secondary school	0
High school	66,7
University	33,3

Gender	%
Industry	
Male	87,5
Female	12,5
Others	
Male	100

Finding a subsidiary	%
Chamber of Agriculture	100
Producer Union	100
Commodity Exchange Boards	100
NGO	100
Industry	40
Input Providers	25

Services provided by stakeholders*	%
Input Providers	24,1
Stroge	22,2
Sales&Marketing	74,1
Product Processing	22,2
Providing Labor	9,3
Education	8,3

*Stakeholders may provide more than one service

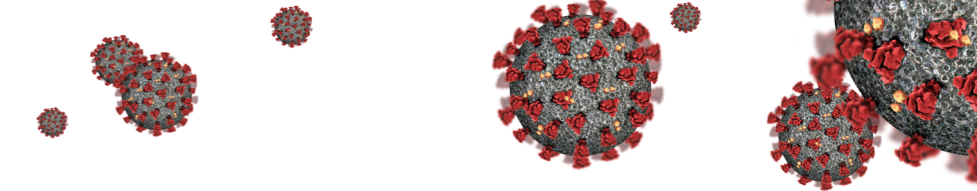
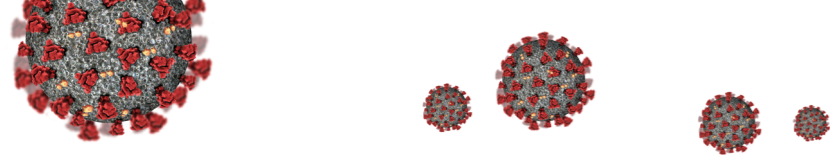
Annex 2 Table 3 Key Information about Farmers

Characteristics	Mean
Age	51,8
Number of household	4,3

Education	%
Primary/Secondary school	64
High school	20
University	16

Place of residence	%
Rural	73,7
City	26,3





Off-farm income	%
Yes	30
No	70

NGO membership	%
Yes	37,5
No	62,5

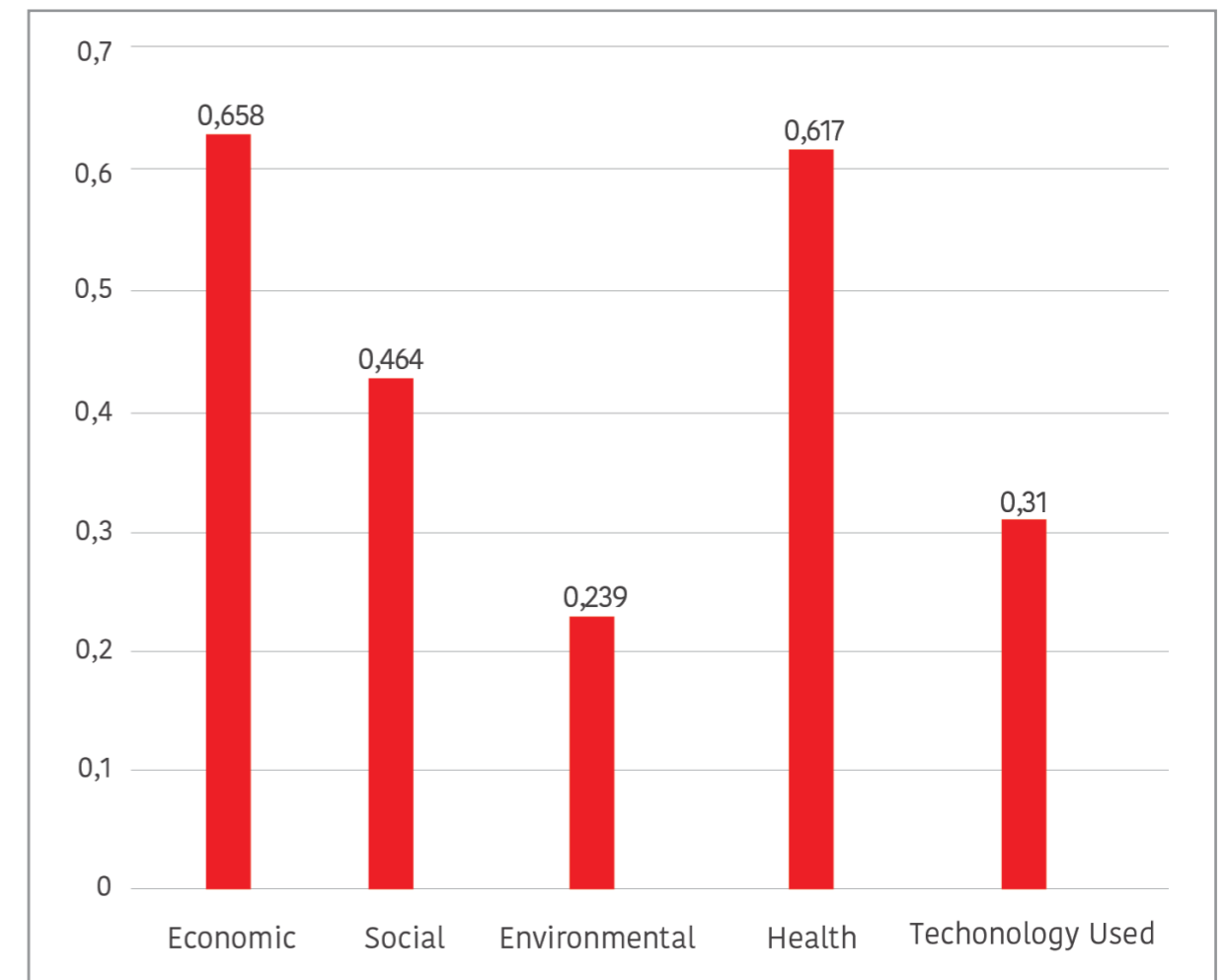
Land size	Min-Max (decars)
Cereals (barley, wheat, corn)	20-540
Legume (peas, beans, chickpeas, peanuts)	5-150
Oil crops (sunflower, cotton, olive)	15-200
Tuber crops (onion, potato, sugar beet, carrot, garlic)	5-350
Fruit (cherry, citrus, lemon, apple, grape, melon, watermelon, persimmon)	2-150
Greenhouse (banana, strawberry)	0,25-15
Vegetable (pepper, capia pepper, tomato, eggplant, cucumber)	5-400
Greenhouse (tomato, bell pepper, eggplant, pepper, cucumber, lettuce, parsley, mint, cress)	0,5-7
Livestock count	5-750
Beehive	200
Chicken (egg)	150

Annex 2 Table 4 Plant production: Impacts of COVID-19

	Mean	Max	Min	Median	StDev
Economic	0.658	0.900	0.219	0.771	0.197
Social	0.464	0.868	0.146	0.430	0.126
Environmental	0.239	0.520	0.146	0.224	0.069
Health	0.617	0.900	0.247	0.573	0.166
Technology Used	0.310	0.800	0.149	0.283	0.117

Friedman Test ($Q=9.488$ $p<0,01$) Kruskal Wallis (3228.81 $p<0,01$)

Annex 2 Figure 1 Plant production: Impacts of COVID-19

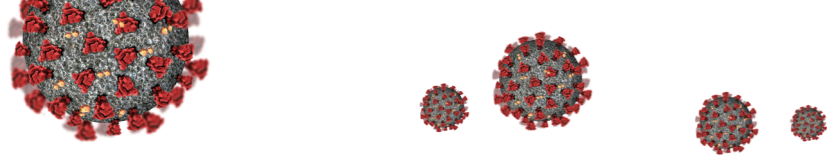


Annex 2 Table 5 Animal production: Impacts of COVID-19

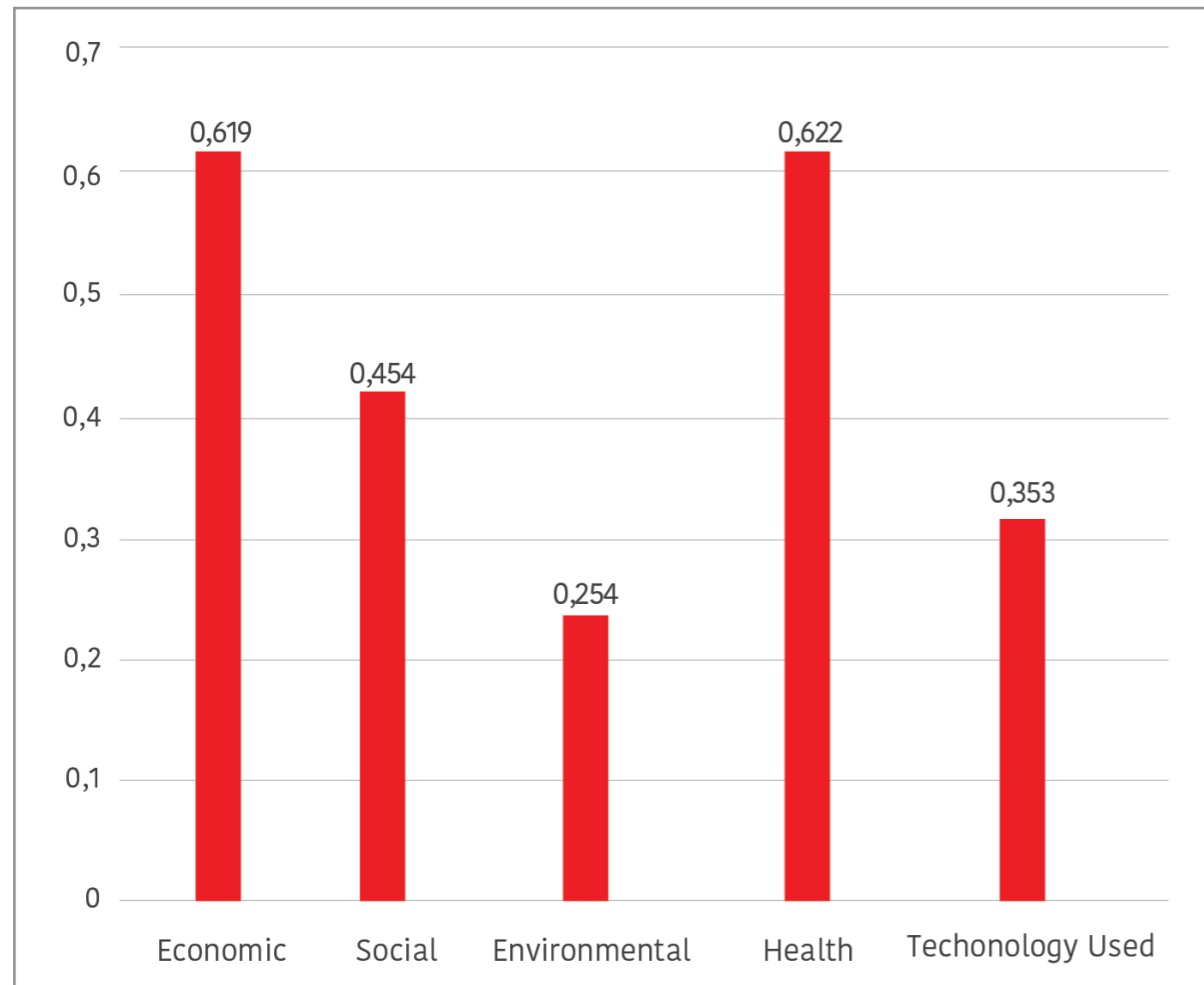
	Mean	Max	Min	Median	StDev
Economic	0.619	0.900	0.235	0.588	0.190
Social	0.454	0.868	0.146	0.430	0.133
Environmental	0.254	0.476	0.146	0.224	0.076
Health	0.622	0.900	0.275	0.582	0.176
Technology Used	0.353	0.868	0.149	0.296	0.178

Friedman Test ($Q=9.488$ $p<0,01$) Kruskal Wallis (15916.86 $p<0,01$).

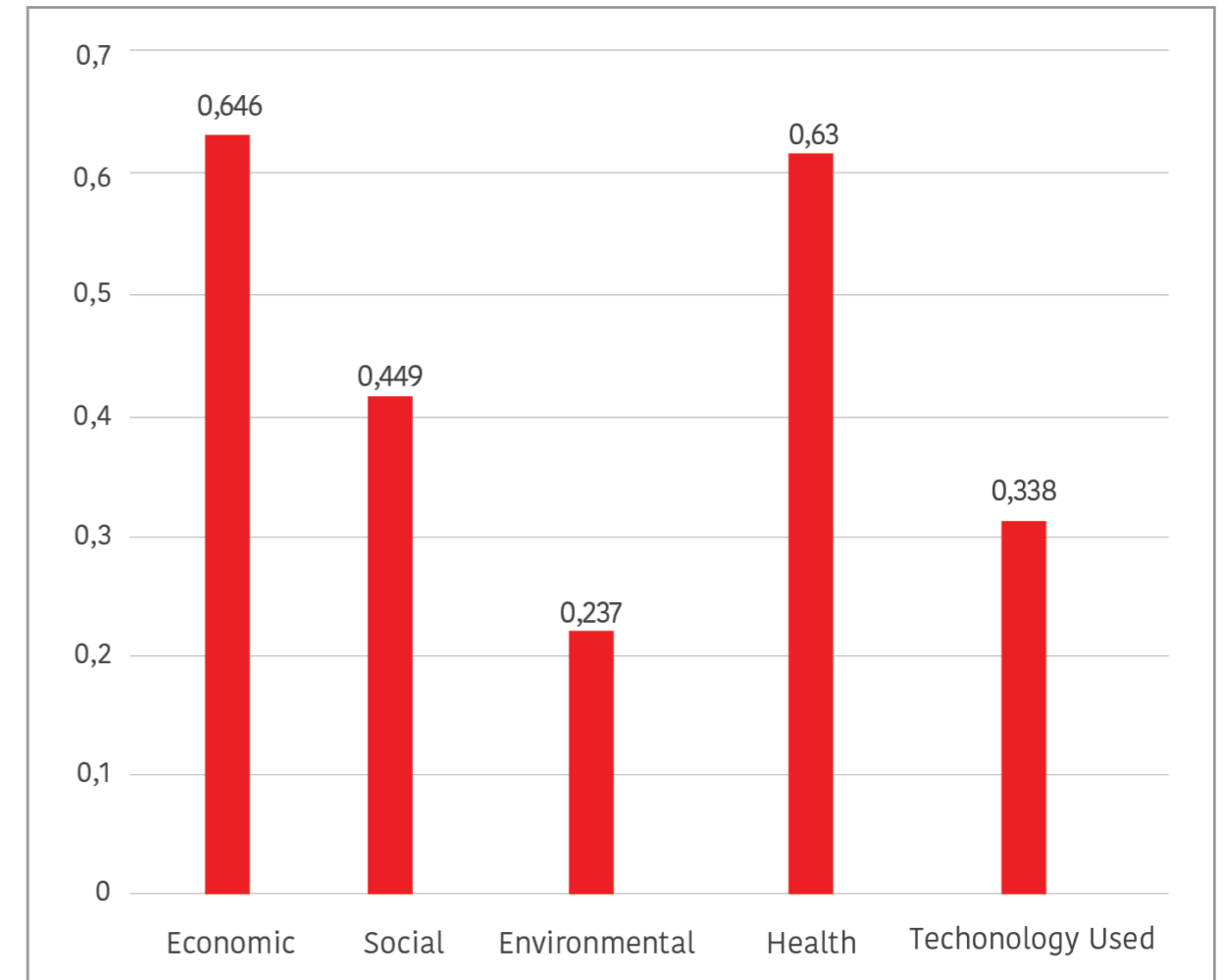




Annex 2 Figure 2. Animal Production: Impacts of COVID-19



Annex 2 Figure 3. Food Industry: Impacts of COVID-19



Annex 2 Table 6 Food Industry: Impacts of COVID-19

	Mean	Max	Min	Median	StDev
Economic	0.646	0.900	0.235	0.629	0.189
Social	0.449	0.868	0.146	0.420	0.123
Environmental	0.237	0.366	0.146	0.224	0.063
Health	0.630	0.900	0.275	0.582	0.160
Technology Used	0.338	0.868	0.171	0.296	0.148

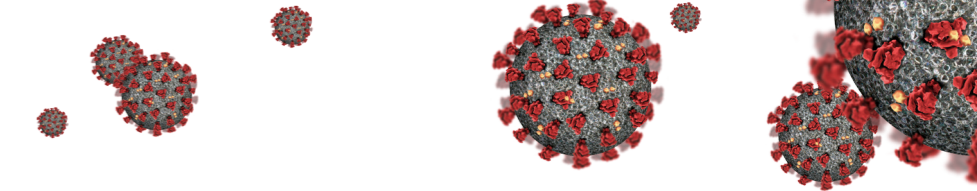
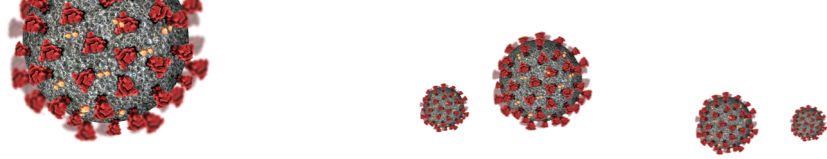
Friedman Test (Q=9.488 p<0,01) Kruskal Wallis (16253.97 p<0,01).

Annex 2 Table 7 Public and Farmers Organizations: Impacts of COVID-19

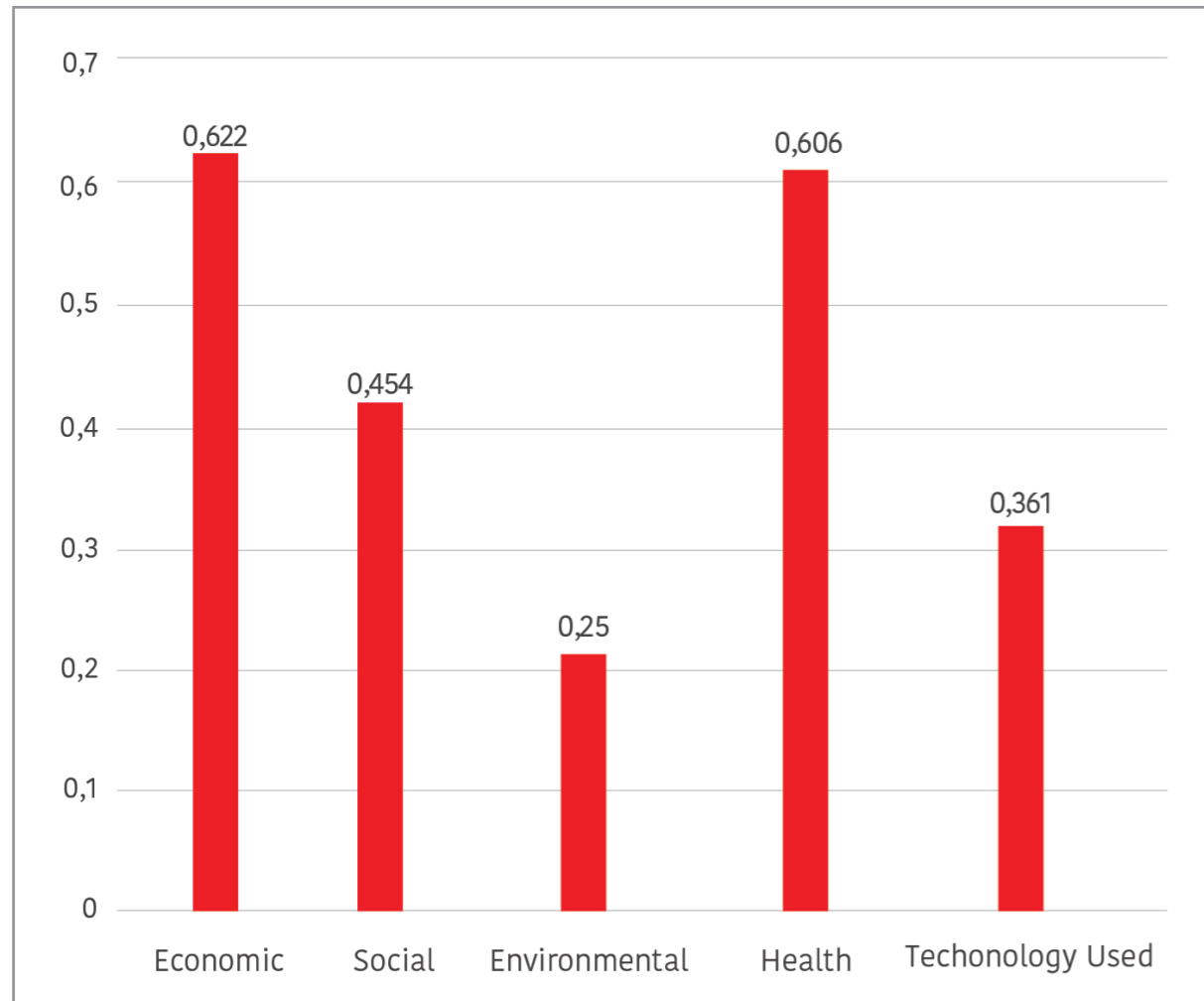
	Mean	Max	Min	Median	StDev
Economic	0.622	0.900	0.219	0.588	0.204
Social	0.454	0.868	0.124	0.432	0.133
Environmental	0.250	0.520	0.146	0.224	0.076
Health	0.606	0.900	0.247	0.573	0.185
Technology Used	0.361	0.868	0.149	0.296	0.175

Friedman Test (Q=9.488 p<0,01) Kruskal Wallis (26103.02 p<0,01)

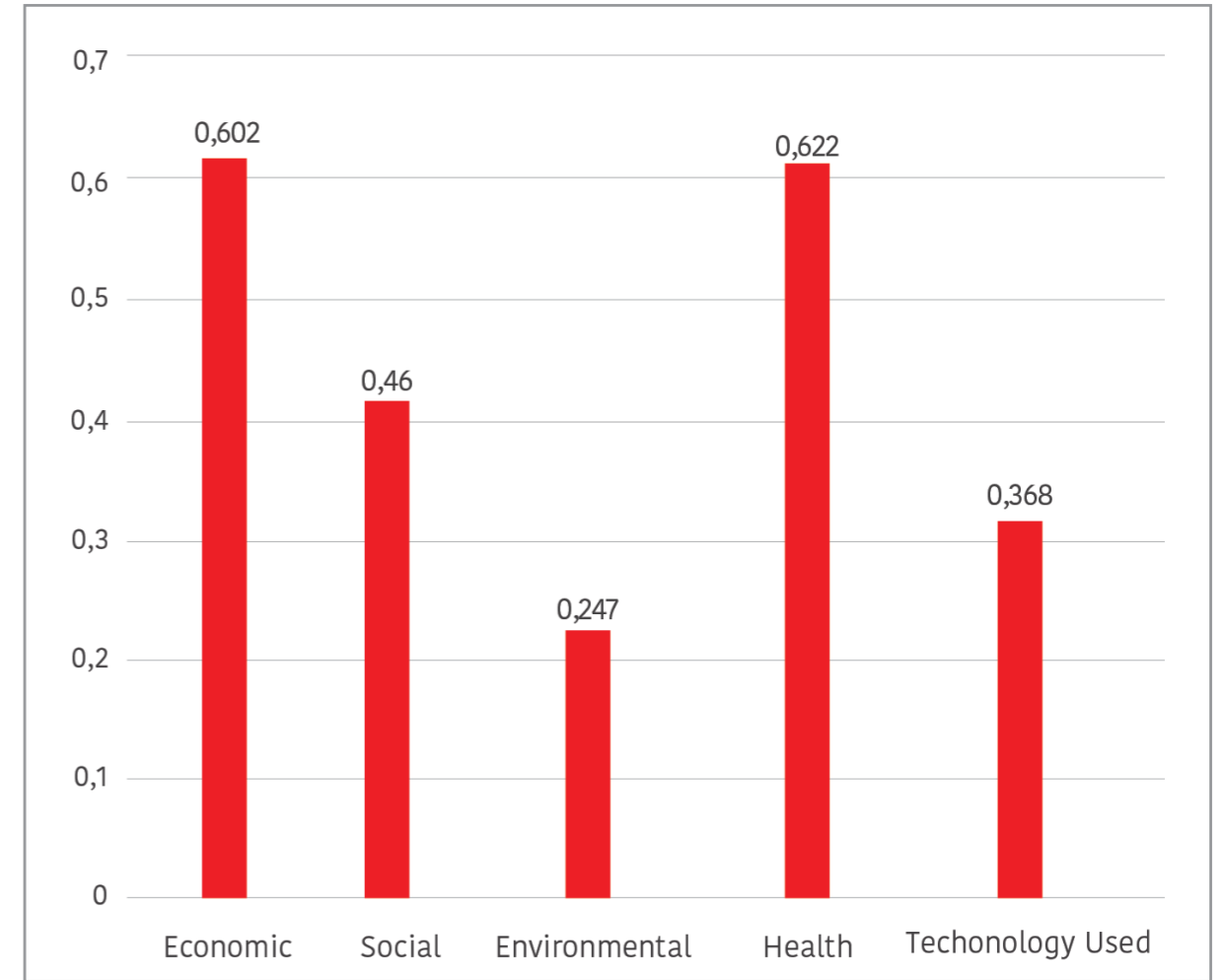




Annex 2 Figure 4. Public and Farmers Organizations: Impacts of COVID-19



Annex 2 Figure 5. Private Sector: Impacts of COVID-19



Annex 2 Table 8 Private Sector: Impacts of COVID-19

	Mean	Max	Min	Median	StDev
Economic	0.602	0.900	0.219	0.558	0.192
Social	0.460	0.868	0.146	0.432	0.128
Environmental	0.247	0.520	0.146	0.224	0.071
Health	0.622	0.900	0.247	0.639	0.181
Technology Used	0.368	0.868	0.149	0.305	0.165

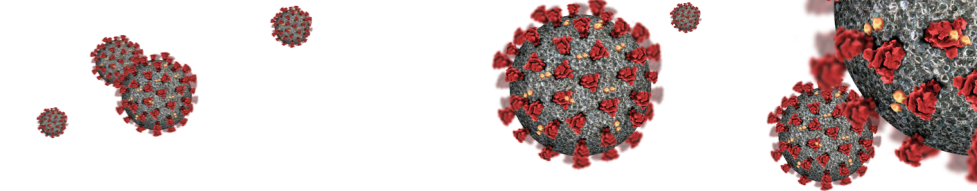
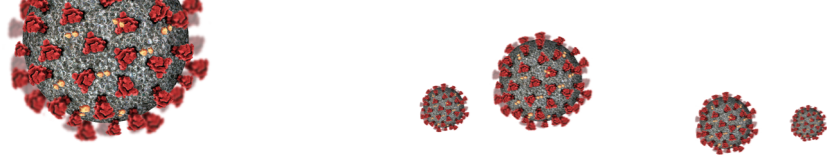
Friedman Test (Q=9.488 p<0,01) Kruskal Wallis (4229.616 p<0,01)

Annex 2 Table 9 Farmer: Impacts of COVID-19

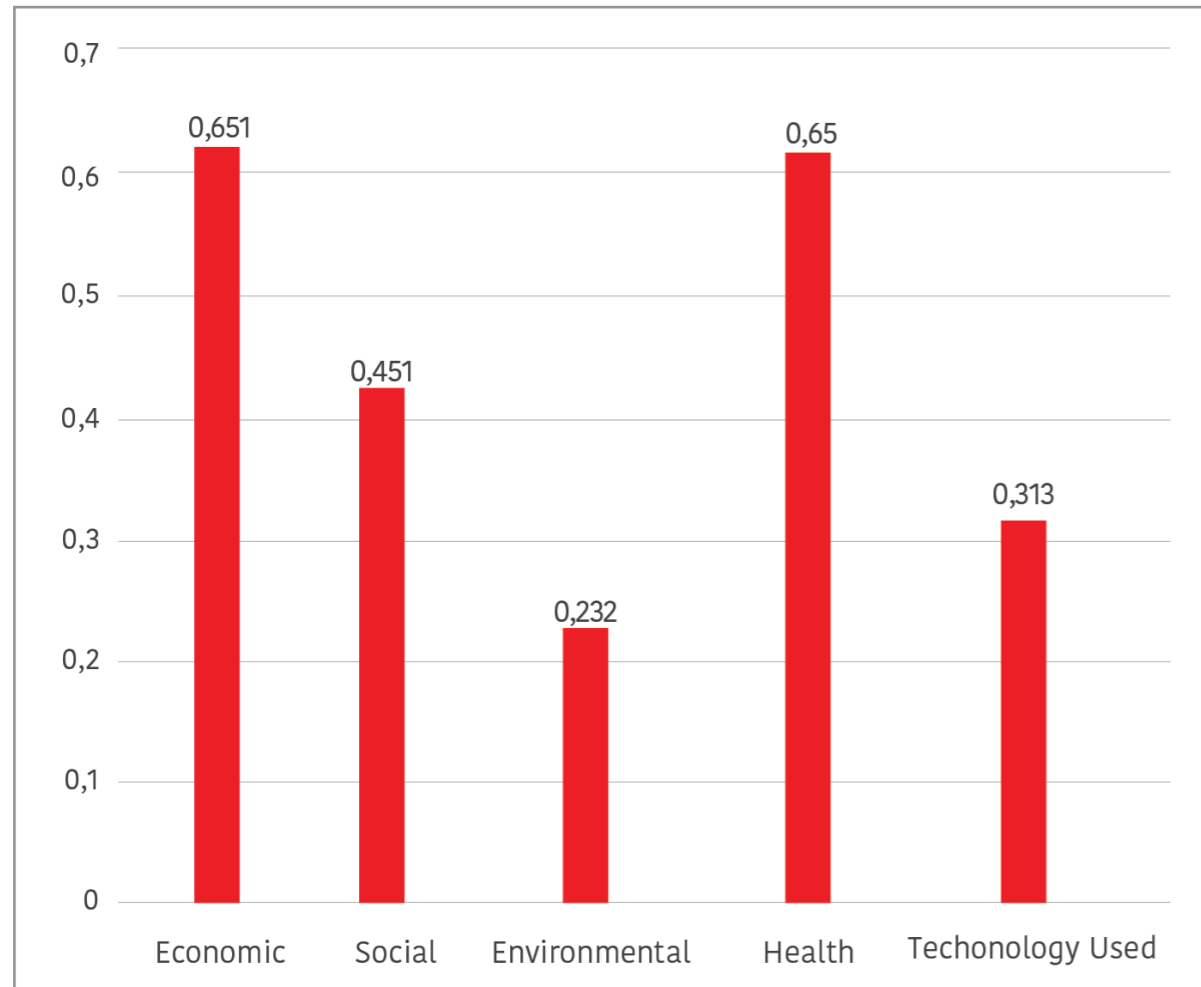
	Mean	Max	Min	Median	StDev
Economic	0.651	0.900	0.333	0.629	0.177
Social	0.451	0.806	0.288	0.430	0.100
Environmental	0.232	0.366	0.146	0.224	0.058
Health	0.650	0.900	0.275	0.639	0.151
Technology Used	0.313	0.609	0.149	0.296	0.106

Friedman Test (Q=9.488 p<0,01) Kruskal Wallis (7402.544 p<0,01)

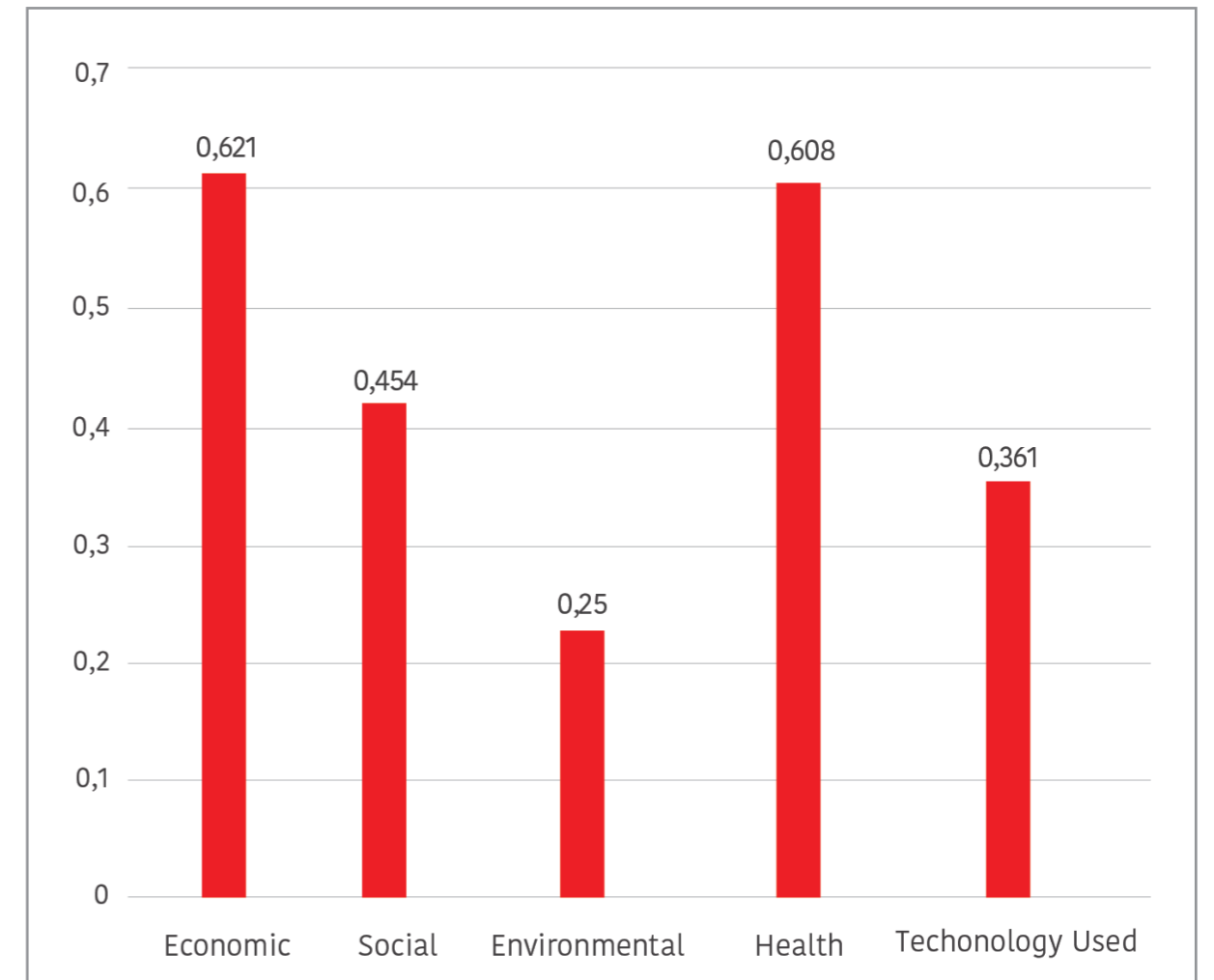




Annex 2 Figure 6. Farmer: Impacts of COVID-19



Annex 2 Figure 7. General Evaluation



Annex 2 Table 10 General evaluation

	Mean	Max	Min	Median	StDev
Economic	0.621	0.900	0.219	0.588	0.203
Social	0.454	0.868	0.146	0.431	0.132
Environmental	0.25	0.520	0.146	0.224	0.075
Health	0.608	0.900	0.247	0.573	0.184
Technology Used	0.361	0.868	0.149	0.296	0.174

Friedman Test ($Q=9.488$ $p<0,01$) Kruskal Wallis (967.013 $p<0,01$)

Annex 2 Table 11 Stakeholder: Impacts of COVID-19

	Economic	Social	Environmental	Health	Technology Used
Public and Farmer Organizations	0.622	0.454	0.250	0.606	0.361
Public Sector	0.602	0.460	0.247	0.622	0.368
Farmer	0.651	0.451	0.232	0.650	0.313
Overall	0.621	0.454	0.250	0.608	0.361



Annex 3 Farmer Survey Form

Survey Form Farmer

Province/District/Village:

Date:

Face to face: Phone call:

A. General Information of Participant

Name, Surname		
Phone		
Age		
Education		
Gender	Female	Male
Marital status		
Experience on agriculture (Year)		
Number of People in the household		
Nonagricultural income	Yes	No
Membership Status to the Agricultural Cooperatives	Yes	No
How many moths staying in the village		

B. Information of Farm

1-Plant production*

Name of product	Area		Production (kg or tons)		Production sold (kg or tons)		Sale price (TL Kg)		Sale place	
	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19

2-Animal Production

Animal	Number (head/number)		Production (kg or tons)		Production sold (kg or tons)		Sale price (TL Kg)		Sale place	
	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19
Animal			xxxx	xxxx						
			xxxx	xxxx						
			xxxx	xxxx						
			xxxx	xxxx						
			xxxx	xxxx						
Animal products	xxxx	xxxx	xxxx	xxxx	Production sold (ton or kg)		xxxx	xxxx	xxxx	xxxx
	xxxx	xxxx								
	xxxx	xxxx								
	xxxx	xxxx								

3- Labor force

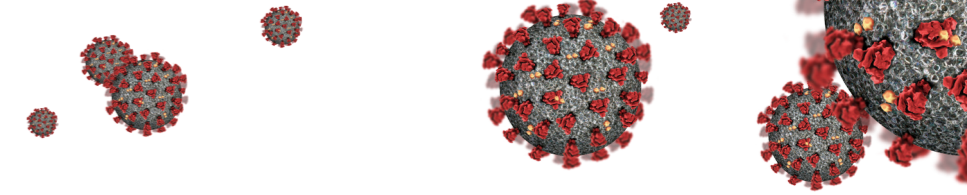
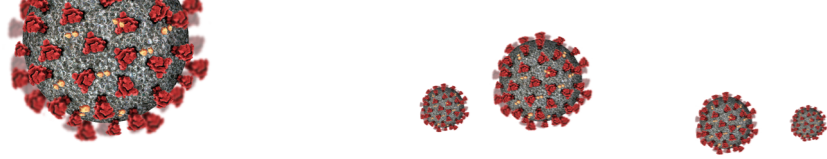
F/M	Age	Family labor (Days)		Permanent labor (Days)		Temporary labor (Days)	
		Before Covid 19	During Covid 19	Before Covid 19	During Covid 19	Before Covid 19	During Covid 19

Monthly wage for permanent worker:TRY Before Covid 19,TRY During Covid 19

Daily wage for temporary worker:TRY Before Covid 19.....TRY During Covid 19

Please noted If there is differences as to Child/Woman/Man or National/Under temporary protection worker.





F/M	Age	Refugees and Asylum Seekers under Temporary Protection (permanent worker)		Refugees and Asylum Seekers under Temporary Protection (temporary worker)	
		Before Covid 19	During Covid 19	Before Covid 19	During Covid 19

Did your children who continue their education remotely contribute more to housework or farm?

4. Machinery/Equipment Inventory of Farm

Type	Number	Sale Status during Covid 19 period (Yes-No) if yes, why and to whom
Tractor		
Plow		
Seeder		
Milking Machine		

5. Which of the following financial supports did you benefit from during the Covid 19 period for your farm?

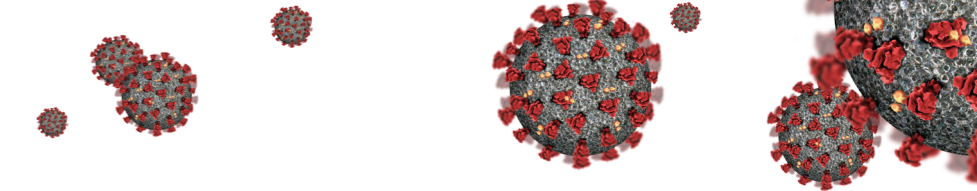
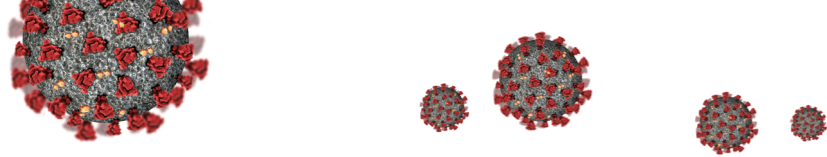
Government support	
Public banks' low interest credit	
Agricultural Credit Cooperatives	
Private bank credit	
Municipality supports	
Borrowing from other persons / institutions	
KOSGEB Supports - Chambers of Commerce etc.	
if not benefited why	

C. COVID 19

6. When you compare Covid 19 period with the previous year, tick the option that corresponds to the following questions? (If there is data in percentage or numbers, please take a note)

CHANGES	Decreased a lot	Decreased	Unchanged	Increased	Increased a lot
1-Economic impact					
Income					
Employment					
Plant variety					
Number of animals					
Income diversity					
Milk production					
Milk sale					
Sale of input					
Purchasing input					
Number of buyers (demand)					
Product sales prices					
Input purchase prices (detail information)					
Shipping costs					
Repayment of loan debts					
Credit usage					
Energy Costs					
Irrigation Costs					
2-Impact on the socio-cultural structure					
Immigration tendency *					
Making new collaboration					
Willingness and capacity to organize					
Women's participation in the workforce					
Participation of the young population in the workforce					
Urban dwellers' view of agriculture					





3-Environmental impact					
Use of pastures					
Use of pesticides					
Use of fertilizers					
Use of organic products					
Organic product production					
Seasonal shifts					
Disasters (hail, flood, etc.)					
4- Health					
Attention to physical distance					
Attention to personal hygiene					
Animal health					
In-house cleaning understanding					
Environmental cleanliness understanding					
5- Use of technology and impact on institutionalization					
Application of new knowledge					
More communication with other institutions/ organizations					
Communication with foreign institutions/organizations					
Making a new venture					
Use of new inputs or techniques					

*Has any of your family migrated to the urban area during the Covid 19 Period? Yes Why..... No
 Has any of your family returned to the village during the Covid 19 Period? Yes Why..... No

Compare the general problems of you during the Covid 19 Period.

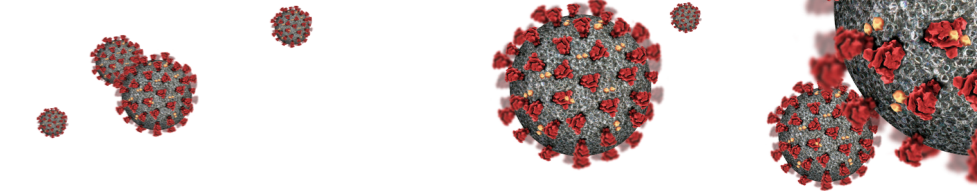
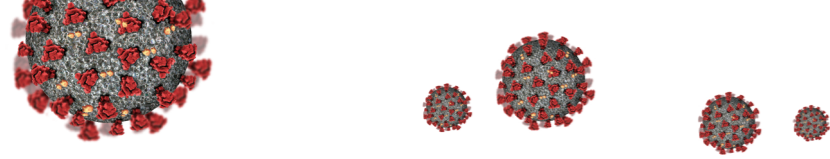
CHANGES	1	2	3	4	5	6	7	8	9	
Economic impact										Impact on the socio-cultural structure
Economic impact										Environmental impact
Economic impact										Health
Economic impact										Use of technology and impact on institutionalization
Impact on the socio-cultural structure										Environmental impact
Impact on the socio-cultural structure										Health
Impact on the socio-cultural structure										Use of technology and impact on institutionalization
Environmental impact										Health
Environmental impact										Use of technology and impact on institutionalization
Health										Use of technology and impact on institutionalization

Did your business have a new initiative in marketing / advertising / branding during the pandemic period? If so, what was done?.....

7. How the COVID 19 Crisis has affected the purchases and sales of the following products in terms of price? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Purchase Price			Sales Price		
	Decrease	Increase	No change	Decrease	Increase	No change
1. Cereals (Wheat, barley, corn etc.)						
2. Legume (Chickpea, Bean, Lentil etc.)						
3. Industrial Crops (Cotton, shp etc.)						
4. Oil Crops (Sunflower, soybean, canola etc.)						
5. Tuber and Root Plants (potatoes, onions)						
6. Fresh fruits and vegetables						
7. Milk and dairy products						





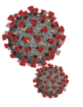
8.Red meat and its products						
9. Poultry meat and its products						
10. Egg						
11. Honey						
12. Fish						
13. Feed and additives						
14. Inputs (.....)						
15. Other						

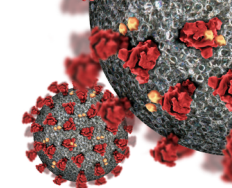
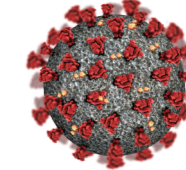
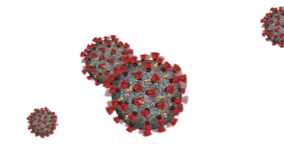
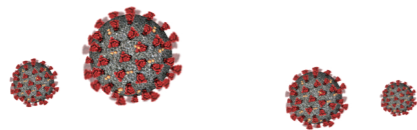
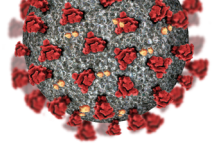
How the COVID 19 Crisis has affected the sales of the following products in terms of amount? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Purchase Price		
	Decrease	Increase	No change
1. Cereals (Wheat, barley, corn etc.)			
2. Legume (Chickpea, Bean, Lentil etc.)			
3. Industrial Crops (Cotton, s.beet etc.)			
4. Oil Crops (Sunflower, soybean, canola etc.)			
5. Tuber and Root Plants (potatoes, onions)			
6.Fresh fruits and vegetables			
7.Milk and dairy products			
8.Red meat and its products			
9. Poultry meat and its products			
10. Egg			
11. Honey			
12. Fish			
13. Feed and additives			
14. Inputs (.....)			
15. Other			

How the COVID 19 Crisis has affected the permanent and temporary/seasonal labor supply for the following products? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Permanent Labor (National)			Temporary Labor (National)			Permanent Labor (Other nationals under temporary protection)			Temporary Labor (Other nationals under temporary protection)		
	Decrease	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change
1. Cereals												
2. Legume												
3.Industrial Crops												
4. Oil Crops												
5. Tuber and Root Plants												
6.Fresh fruits and vegetables												
7.Milk and dairy products												
8.Red meat and its products												
9. Poultry meat and its products												
10. Egg												
11. Honey												
12. Fish												
13. Feed and additives												
14. Inputs (.....)												
15. Other												





How did you bring your products to the market during the COVID 19 Crisis? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Farmers			Manufacturers			Farmer cooperatives unions			Farmers rented trucks			Farmers rented trucks			No Sale		
1. Cereals																		
2. Legume																		
3. Industrial Crops																		
4. Oil Crops																		
5. Tuber and Root Plants																		
6. Fresh fruits and vegetables																		
7. Milk and dairy products																		
8. Red meat and its products																		
9. Poultry meat and its products																		
10. Egg																		
11. Honey																		
12. Fish																		
13. Feed and additives																		
14. Inputs (.....)																		
15. Other																		

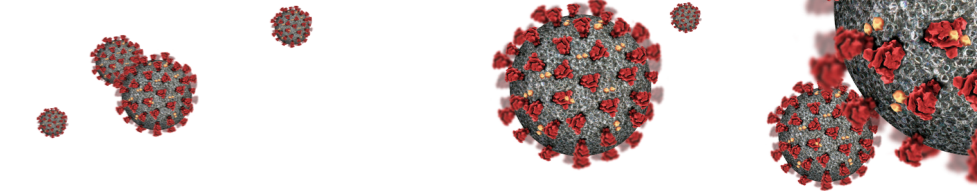
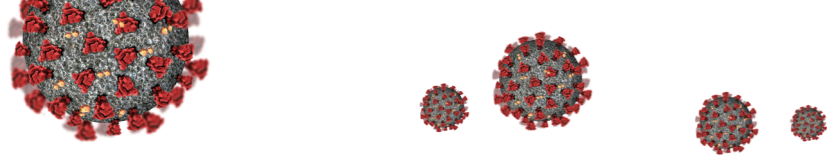
D. Regulations and policies during Covid 19 period

8. Did you know about the measures and supports taken by the Ministry of Agriculture and Forestry during Covid 19 period? If yes, how did you hear it?

Measures or supports	Yes	No	Information Source (specify)
Transport exemptions to farmers			
Transport exemptions for seasonal workers			
Facilitating agricultural workers' access to hygiene and protective equipment			
Regulation of the housing conditions of seasonal agricultural workers			
Ease of access to supply the harvested products to the market			
Postponement of the lease payments for April, May and June for the farmers who rent the agricultural lands belonging to the treasury for 6 months in order to support the agricultural production.			
Within the scope of Crop Production Supports; extension of application periods for difference payment supports and Good Agricultural Practices and Organic Agriculture supports			
Increasing the Raw Milk Premium Support to 15 Kuruş in December 2019, January, February and March 2020 in order to maintain sustainability in milk production			
Livestock and animal production sectors are exempted from the restrictions applied			
Providing one-time feed support to cattle breeding and dairy businesses and small family businesses engaged in raising small cattle			
Extension of the process of signing the grant agreement between the Provincial Directorates of the 13th Stage Rural Development Investments Support Program (KKYDP) and Investors			
IFAD Investment Supports			

9. Which government regulations made during Covid 19 period positively affected the activities and functioning of your farm?





10. Which public regulations made in the period of Covid 19 negatively affected the activities and functioning of your agricultural business?

11- Has there been a change in the income distribution within the family after Covid-19?

E. INFORMATION AND EDUCATION

12. Have you received information and training support for the business and employees due to COVID-19? Yes institutions and organizations (Please specify) No

13. Is there a biosecurity program for your institution due to COVID-19? (Before and after)

Before Covid 19	Yes	No
After Covid 19	Yes	No
Unknown biosecurity program		

14. Are personal Biosecurity measures taken for employees due to COVID-19 disease? (Before and after)

Before Covid 19	Yes	No
After Covid 19	Yes	No
Unknown biosecurity program		

15. Are measures such as masks, social distance and personal hygiene followed? And what is the cost to you?

16. What kind of changes in your prices due to COVID-19 disease? For example: Cost, Working conditions, hygienic measures, packaging, logistics, etc.

16. What kind of changes in your prices due to COVID-19 disease? For example: Cost, Working conditions, hygienic measures, packaging, logistics, etc.

17. What are the changes in your sales prices due to the increase in your costs due to COVID-19 disease?

F. Questions and suggestions for the future (Open-ended questions).

18. In your opinion, what kind of support is most needed for your farm, households or any people who earn their income from agriculture to improve their income (loans, supports, grants, entrepreneurship support, etc.) and living standards? Which institutions or organizations should these supports be provided?

19. When the Covid 19 pandemic period is over, do you plan to expand, reduce or keep your business at its current level?

20. What are the limiting factors for your business in the next 1 year? Apart from your current activity, do you have any plans for the future?



Annex 4 Stakeholder Survey Form

Survey Form

Province/District/Village:

Date:

Face to face: Phone call:

A. General Information

Name of Institution	
Name and Surname	
Gender	Female Male
Duty	
Age	
Education	
Experience on agriculture (Year)	
Phone	

B. Profil / Activity

1. Is there a subsidiary affiliations of your organization (such as a company, etc.)? If there is:.....

(Will not be asked in the Stock Exchange Boards with the MoAF)

Legal status	Activities

2. In which of the following products and activities does your organization work?

Activities	*	*	*	*	*	*
Production						
• Input Supplier						
• Input credit						
• Technical assistance / Training						
• Other						
Storage						

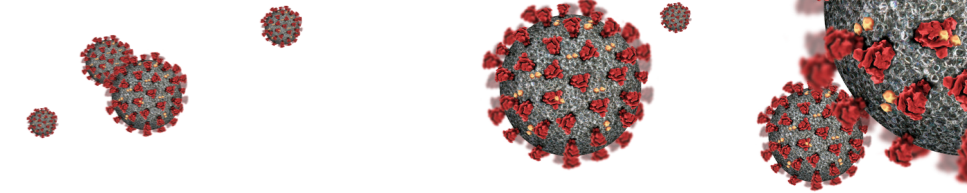
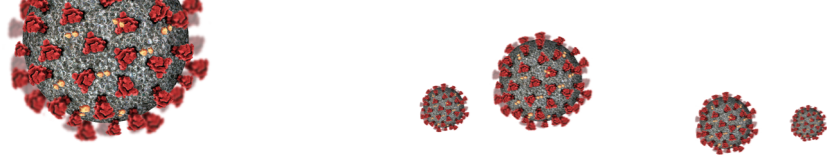
Processing						
Sales / marketing						
Labor supply						
Other (specify)						

- * 1. Cereals (Wheat, barley, corn etc.)
- 2. Legume (Chickpea, Bean, Lentil etc.)
- 3. Industrial Crops (Cotton, s.beet etc.)
- 4. Oil Crops (Sunflower, soybean, canola etc.)
- 5. Tuber and Root Plants (potatoes, onions)
- 6. Fresh fruits and vegetables
- 7. Milk and dairy products
- 8. Red meat and its products
- 9. Poultry meat and its products
- 10. Egg
- 11. Honey
- 12. Fish
- 13. Feed and additives
- 14. Inputs (.....)
- 15. Other

3. The approximate number or percentage of farmers / buyers / sellers you do business with fall into the following categories? (This question will not be asked in the meetings of the Ministry of Agriculture and Forestry)

	Write the product order in the table above					
Scale	*	*	*	*	*	*
Small scale farm (>20 da or 5 head animal)						
Medium scale farm (30-100 da or 6-50 head animal)						
Large scale farm (>100 da or 50 head animal)						
Trader						
Intermediator						
Retailer						
Processor						
Exporter/Importer						
Other(specify)						





4. How many people are working in your organization? (More detailed information should be obtained from seasonal agricultural worker intermediaries)

Scale	Before Covid 19*				During Covid 19			
	Female	<20 age	Male	<20 age	Female	<20 age	Male	<20 age
Permanent (white-collar worker)								
Permanent (blue-collar worker)								
Temporary (white-collar worker)								
Temporary (blue-collar worker)								
Refugees and Asylum Seekers under protection (permanent worker)								
Refugees and Asylum Seekers under protection (temporary worker)								

* Before Covid19: The status of the product / activity in the previous season.

Considering the pandemic period, write the appropriate answers to the following questions. (This question is only for seasonal agricultural intermediaries)

How many agricultural workers do you have in the national and social protection group?	Number of National Male Workers: Number of National Women Workers: Number of National male workers under the age of 18: National Number of female workers under 18: Number of Migrant Male Workers: Number of Migrant Women Workers: Number of migrant male workers under the age of 18: Number of migrant women under 18:
How do you find the agricultural workers?	
How do you find the firms in need of agricultural workers?	

In which jobs and which product groups do you provide labor force within a year?	
Do you make a written contract with those who apply for agricultural workers?	
What are the services provided by public institutions for seasonal agricultural workers? Can you get detailed information in both groups?	
How were the transportation and legal permissions of agricultural workers who had to go to work in the agricultural sector in other provinces during the pandemic? Have any positive or negative situations been encountered during the transportation period?	

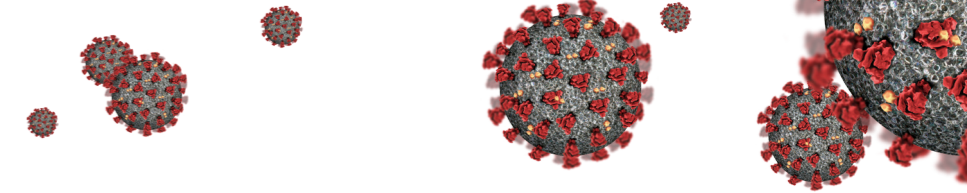
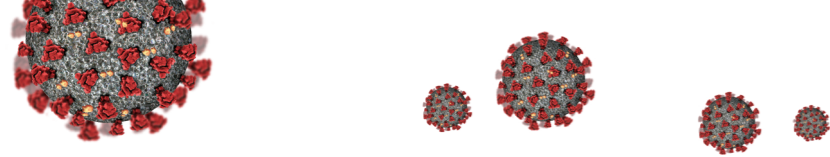
5. If there are people in your organization who had to leave during the Covid 19 period, where did they get their financial resources?

6. If your organization has increased employment during the Covid 19 pandemic, what is the reason? (Please explain their qualifications, working conditions, where they come from, their duties, etc.) Indicate whether there is sufficient and qualified workforce.

7. Which of the following financial supports did your organization benefit from during the Covid 19 period?

Government support	
Public banks' low interest credit	
Agricultural Credit Cooperatives	
Private bank credit	





Municipality supports	
Borrowing from other persons / institutions	
KOSGEB Supports - Chambers of Commerce etc.	
if not benefited Reason:	

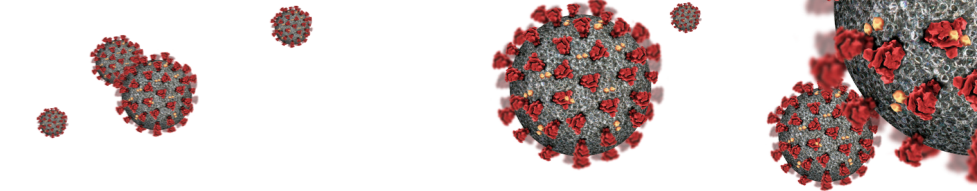
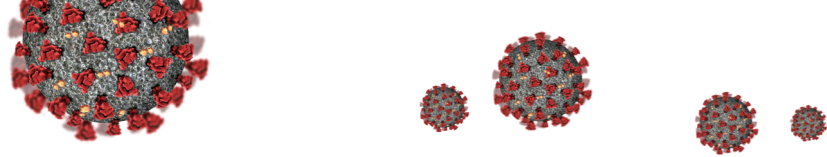
C. COVID 19

8. When you compare Covid 19 period with the previous year, tick the option that corresponds to the following questions? (If there is data in percentage or numbers, please take a note)

CHANGES	Not at all/ to much decreased	Decreased	Unchanged	Increased	Too much Increased
1-Economic impact					
Income					
Employment					
Plant variety					
Number of animals					
Income diversity					
Milk production					
Milk sale					
Sale of input					
Purchasing input					
Number of buyers (demand)					
Product sales prices					
Input purchase prices (detail information)					
Shipping costs					
Repayment of loan debts					
Credit usage					
2-Impact on the socio-cultural structure					
Immigration tendency *					
Making new collaboration					
Willingness and capacity to cooperation					
Women's participation in the workforce					
Participation of the young population in the workforce					

3-Environmental impact					
Use of pastures					
Use of pesticides					
Use of fertilizers					
Use of organic products					
Organic product production					
Seasonal shifts					
Disasters (hail, flood, etc.)					
4- Health					
Attention to physical distance					
Attention to personal hygiene					
Animal health					
In-house cleaning understanding					
Environmental cleanliness understanding					
5- Use of technology and impact on institutionalization					
Application of new knowledge					
More communication with other institutions/organizations					
Communication with foreign institutions/organizations					
Making a new venture					
Use of new inputs or techniques					





Compare the general problems of you during the Covid 19 Period.

CHANGES	1	2	3	4	5	6	7	8	9	
Economic impact										Impact on the socio-cultural structure
Economic impact										Environmental impact
Economic impact										Health
Economic impact										Use of technology and impact on institutionalization
Impact on the socio-cultural structure										Environmental impact
Impact on the socio-cultural structure										Health
Impact on the socio-cultural structure										Use of technology and impact on institutionalization
Environmental impact										Health
Environmental impact										Use of technology and impact on institutionalization
Health										Use of technology and impact on institutionalization

9- Did your business have a new initiative in marketing / advertising / branding during the pandemic period? If so, what was done?.....?

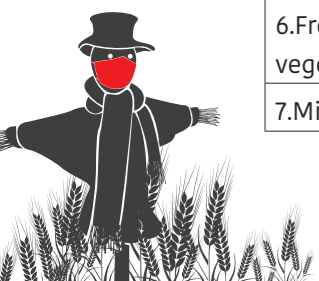
10. How the COVID 19 Crisis has affected the purchases and sales of the following products in terms of price? ? (If there is concrete data in the questions in percentage or numbers, please take a note)

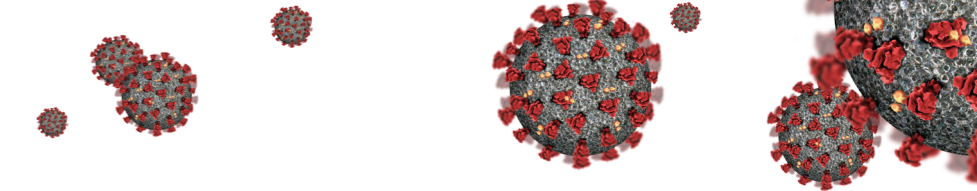
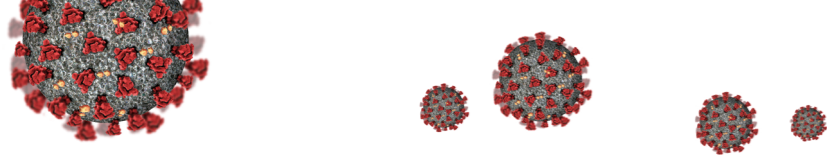
Products	Purchase Price			Sales Price		
	Decrease	Increase	No change	Decrease	Increase	No change
1. Cereals (Wheat, barley, corn etc.)						
2. Legume (Chickpea, Bean, Lentil etc.)						
3. Industrial Crops (Cotton, shp etc.)						
4. Oil Crops (Sunflower, soybean, canola etc.)						
5. Tuber and Root Plants (potatoes, onions)						
6. Fresh fruits and vegetables						
7. Milk and dairy products						

8. Red meat and its products						
9. Poultry meat and its products						
10. Egg						
11. Honey						
12. Fish						
13. Feed and additives						
14. Inputs (.....)						
15. Other						

How the COVID 19 Crisis has affected the sales of the following products in terms of amount? ? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Amount of Purchased			Amount of Sales		
	Decrease	Increase	No change	Decrease	Increase	Nochange
1. Cereals (Wheat, barley, corn etc.)						
2. Legume (Chickpea, Bean, Lentil etc.)						
3. Industrial Crops (Cotton, shp etc.)						
4. Oil Crops (Sunflower, soybean, canola etc.)						
5. Tuber and Root Plants (potatoes, onions)						
6. Fresh fruits and vegetables						
7. Milk and dairy products						
8. Red meat and its products						
9. Poultry meat and its products						
10. Egg						
11. Honey						
12. Fish						
13. Feed and additives						
14. Inputs (.....)						
15. Other						





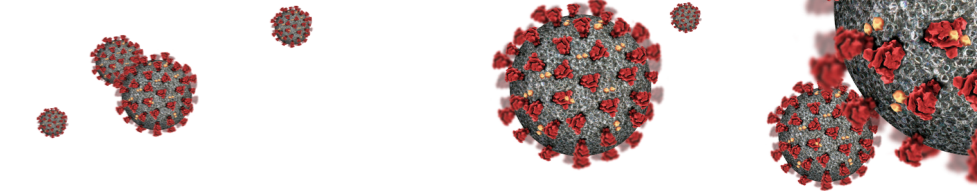
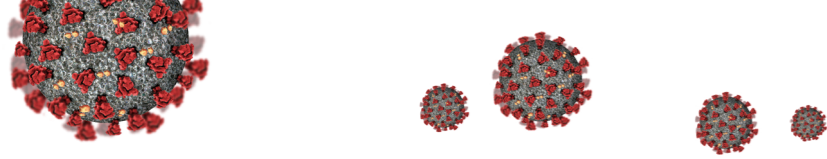
How the COVID 19 Crisis has affected the permanent and temporary/seasonal labor supply for the following products? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Permanent Labor (National)			Temporary Labor (National)			Permanent Labor (Other nationals under temporary protection)			Temporary Labor (Other nationals under temporary protection)		
	Decrease	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change
1. Cereals												
2. Legume												
3. Industrial Crops												
4. Oil Crops												
5. Tuber and Root Plants												
6. Fresh fruits and vegetables												
7. Milk and dairy products												
8. Red meat and its products												
9. Poultry meat and its products												
10. Egg												
11. Honey												
12. Fish												
13. Feed and additives												
14. Inputs (.....)												
15. Other												

How did you producers bring their products to the market during the COVID 19 Crisis? (If there is concrete data in the questions in percentage or numbers, please take a note)

Products	Farmers	Manufacturers	Farmer cooperatives unions	Farmers rented trucks	Farmers rented trucks	No Sale
1. Cereals						
2. Legume						
3. Industrial Crops						
4. Oil Crops						
5. Tuber and Root Plants						
6. Fresh fruits and vegetables						
7. Milk and dairy products						
8. Red meat and its products						
9. Poultry meat and its products						
10. Egg						
11. Honey						
12. Fish						
13. Feed and additives						
14. Inputs (.....)						
15. Other						





D. Regulations and policies during Covid 19 period

11. Did you know about the measures and supports taken by the Ministry of Agriculture and Forestry during Covid 19 period? If yes, how did you hear it?

Measures or supports	Yes	No	Information Source (specify)
Transport exemptions to farmers			
Transport exemptions for seasonal workers			
Facilitating agricultural workers' access to hygiene and protective equipment			
Regulation of the housing conditions of seasonal agricultural workers			
Ease of access to supply the harvested products to the market			
Postponement of the lease payments for April, May and June for the farmers who rent the agricultural lands belonging to the treasury for 6 months in order to support the agricultural production.			
Within the scope of Crop Production Supports; extension of application periods for difference payment supports and Good Agricultural Practices and Organic Agriculture supports			
Increasing the Raw Milk Premium Support to 15 Kurus in December 2019, January, February and March 2020 in order to maintain sustainability in milk production			
Livestock and animal production sectors are exempted from the restrictions applied			
Providing one-time feed support to cattle breeding and dairy businesses and small family businesses engaged in raising small cattle			
Extension of the process of signing the grant agreement between the Provincial Directorates of the 13th Stage Rural Development Investments Support Program (KKYDP) and Investors			
IFAD Investment Supports			

12. Which government regulations made during Covid 19 period positively affected the activities and functioning of your business?



13. Which public regulations made in the period of Covid 19 negatively affected the activities and functioning of your business?

E. INFORMATION AND EDUCATION

14. Have you received information and training support for the business and employees due to COVID-19? Yes institutions and organizations (Please specify) No

15. Is there a biosecurity program for your institution due to COVID-19? (Before and after)

Before Covid 19	Yes	No
After Covid 19	Yes	No
Unknown biosecurity program		

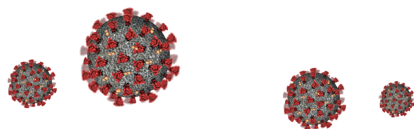
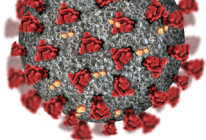
16. Are personal Biosecurity measures taken for employees due to COVID-19 disease? (Before and after)

Before Covid 19	Yes	No
After Covid 19	Yes	No
Unknown biosecurity program		

17. Are measures such as masks, social distance and personal hygiene followed? And what is the cost to you?

18. What kind of changes in your prices due to COVID-19 disease? For example: Cost, Working conditions, hygienic measures, packaging, logistics, etc.

19. What are the changes in your sales prices due to the increase in your costs due to COVID-19 disease?



F. Questions and suggestions for the future (Open-ended questions).

20. In your opinion, what kind of support is most needed for your business, farmers, rural households or any people who earn their income from agriculture to improve their income (loans, supports, grants, entrepreneurship support, etc.) and living standards? Which institutions or organizations should these supports be provided?

21. When the Covid 19 pandemic period is over, do you plan to expand, reduce or keep your business at its current level?

22. What are the limiting factors for your business in the next 1 year? Apart from your current activity, do you have any plans for the future?

