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Acronyms and abbreviations

ABD	Asian Development Bank
AFSA	Azerbaijan Food Safety Agency of the Republic of Azerbaijan
AKIA	Azerbaijan Agency for Agro-Credit and Development
ASAN	State Agency for Public Service and Social Innovations under the President of the Republic of Azerbaijan
AZPROMO	Azerbaijan Export and Investment Promotion Foundation under the Ministry of Economy of the Republic of Azerbaijan
BSEC	Black Sea Economic Commission
CBD	Convention for Biological Diversity
CIRAD	French Agricultural Research Centre for International Development
CIS	Commonwealth of Independent States
CCKP	Climate Change Knowledge Portal
CSFS	Centre for Sustainable Food Systems
EEA	European Environment Agency
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environmental Facility
IPPC	International Plant Protection Organization
IPCC	Intergovernmental Panel on Climate Change
IFAD	International Fund for Agricultural Development
OIE	World Organization for Animal Health
RWR	Renewable water resources
SFS	Sustainable Food System
SSC	State Statistical Committee of the Republic of Azerbaijan
TEU	Twenty Foot Equivalent Unit
UNFCCC	United Nations Convention on Climate Change
UNEP	United Nations Environment Programme
UNEP-WCMC	UN Environment World Conservation Monitoring Centre
UNICEF	United Nations Children's Fund
UNDESA	United Nations Department of Economic and Social Affairs
USAID	United Nations Agency for International Development
WHO	World Health Organization
WFP	World Food Programme

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Executive Summary

This rapid assessment aims to provide an initial broad understanding of the main challenges and opportunities of Azerbaijan's food systems, and serves to guide further discussions on relevant interventions. An integrated, **food systems approach** highlights the interconnections between production, consumption and broader socio-economic and environmental contexts, bringing trade-offs and synergies to the forefront.

Approach and conceptual framework. The analysis follows the framework of food systems for diets and nutrition outlined in a recent report by the Committee on World Food Security's (CFS) High Level Panel of Experts on Food Security and Nutrition (HLPE, 2017). Key areas discussed include: external factors affecting producers' and consumers' decisions (drivers), food supply chains, food environments, consumer behaviours and diets, health outcomes, and the broader impacts on society and the planet. This assessment is based on data from reliable international and national databases, as well as expert interviews.

Drivers. Azerbaijan is characterized by diversified climatic and land conditions that allow for the production of various crop types, ranging from Mediterranean (citrus, olives) to typical continental crops. Main crop production takes place in the Aran region, which is the largest by total land area. Due to growing demand for organic products on domestic and international markets, Azerbaijan has identified organic agriculture as a priority. Natural soil and climatic conditions favour organic farming, and the existence of scientific and educational institutions in the agrarian sector and experienced farmers provide a suitable context for the promotion of organic agriculture across the country.

Despite the country's significant agricultural potential, agricultural productivity and profitability vary widely across regions. The agricultural sector contributes 6.9 percent to GDP, but productivity remains low due to lack of modernization, low rainfall, scarcity of arable land, fragmented landholdings and serious degradation of natural resources in terms of water pollution, reduced water availability, soil erosion, salinity, and loss of soil fertility and organic matter.

Food supply chains. Azerbaijan supply chains reflect a mixed food system, combining traditional and modern elements. Most farms are small and poorly organized, with 70 percent of farms having 2 hectares (ha) or less of arable land. Addressing this issue is fundamental to increasing agricultural producing capacity. Accordingly, the government has adopted measures including land consolidation, cooperation agreements and the creation of farmers' associations.

In 2020, the country introduced a new state support mechanism for the agricultural sector, the main goals of which are to ensure efficient use of agricultural land, improve farmer competitiveness and expand the production of crops with high market potential. The new mechanism also aims to encourage farmers to form cooperatives by increasing subsidies to cooperative members by 10 percent.

Additionally, lack of know-how and an absence of agricultural extension services, in combination with minimal trust and a reluctance to cooperate, make it difficult for smallholders to access financial capital to develop farming activities.

Food environments. The level of self-sufficiency in Azerbaijan is linked to the strengthening of local production capacity, mainly staples such as meat, vegetables and fruits. Currently, self-sufficiency levels are 100 percent for fruits and vegetables, melons and eggs, 83.5 percent for meat and dairy products, and about 90 percent for potatoes (National Pathway to Sustainable Food Systems by 2030). Food safety is a high priority with steps being taken under the Food Safety Programme to produce and supply healthy and safe food products to the population.

According to the Global Food Security Index (2020), Azerbaijan ranked 56th out of 113 in terms of food security, indicating good performance. The country scored 63.3 for availability of food products, but 60.9 for quality and safety of food products – the weakest performing indicator. Conversely, the score for affordability of food increased to 75.9. The cost of meeting nutrient adequacy in food (as a percentage of household food expenditure on food and non-alcoholic beverages) is 32 percent. The average value of food production in Azerbaijan was reported to be USD 266 per capita (FAOSTAT data, 2020).

Consumer behaviour. The dynamics of food expenditure in Azerbaijan are determined by the choice and prices of food products, which depend on several factors. The principal factor is population income, which fluctuates during periods of economic growth or recession. The COVID-19 pandemic, among other things, changed consumer behaviour, but the situation is gradually normalizing. In general, food accounts for half of household expenditure.

Statistical data for recent years show that the Azerbaijani population has begun to consume more bread, potatoes, vegetables and fruit, as well as meat. Each person in Azerbaijan consumes most of the basic foodstuffs included in the minimum consumer basket in excess of annual consumption norms. Meanwhile, the current level of consumption of potatoes, vegetables, melons, fruit and berries exceeds the standard level adopted in the country. The level of sugar consumption in the country is also above the norm, while the consumption of fish and fish products is below the norm.

Consumption of butter in the country is half the norm. In contrast, the consumption of vegetable oils is 164 percent of the norm, implying that the population substitutes vegetable oils for butter.

Another concern is food waste and loss, which is driven mainly by consumer behaviour. In Azerbaijan, high levels of food waste are observed in particular at weddings, funerals and other customary celebrations, which take place at public wedding venues and ceremonial halls. This trend is underpinned by popular customs and traditions and a desire to keep up with neighbours and relatives. Additionally, consumers tend to buy products in large quantities or in batches, then refrigerate them for long periods of time, often resulting in spoilage (FAO, 2022).

Diets. Positive trends in food consumption have been observed over the last five years: potato consumption per capita increased by 21.1 percent, vegetable consumption by 17.2 percent, meat and meat products by 4.7 percent, egg consumption by 12.3 percent, fruit and berry consumption by 13.9 percent, and vegetable oil and margarine consumption by 12.2 percent (SSC, 2021).

Bread is one of the main staple foods of the population. Per capita bread consumption has increased, while milk consumption has dropped by 13.0 percent, and sugar and confectionary consumption has increased by 5.6 percent.

According to these data, the Azerbaijani population has begun to consume more potatoes, vegetables and fruits. Consumption of milk and dairy products first shows an upward and then a downward pattern over the period 2010–2019, while consumption of protein-rich products such as meat, fish and eggs has increased. In Azerbaijan the availability of fruit, vegetables and vegetable oils is closer to or higher than the world average, while the availability of pulses is much lower. Vegetable oil and margarine consumption has increased in Azerbaijan over recent years.

Food systems outcomes. Azerbaijan has a varied selection of food products allowing for nutritious and healthy diets. However, while self-sufficient in regard to major staples (see above), food diversification remains a challenge. The middle class eats a significant amount of meat, chicken, rice and bread, but children, in particular, do not consume enough fruits and vegetables. Prevalence of undernourishment in Azerbaijan is less than 2.5 percent; however, the level of obesity among the adult population is 19.9 percent.

In spite of the above positive trends, food systems still face a number of problems. As a result of intensive methods of production, more than 1 million ha (more than 20 percent) of agricultural land are in a state of varying degrees of salinization, erosion, waterlogging and other forms of degradation. Climate change and loss of biodiversity also pose major risks to the agri-food sector with far-reaching negative consequences. About 50–55 percent of farmers suffer from water scarcity in Azerbaijan, which is located in an arid zone and has limited water resources.

Azerbaijan is ranked 73rd out of 181 countries in the 2020 ND-GAIN Index (University of Notre Dame, 2020) for vulnerability to climate change impacts. Water availability is a major concern as rainfall is inadequate and unevenly distributed across the country, as is the case for water resources. According to assessments conducted by the World Water Resources Institute, Azerbaijan is forecast to be one of 13 countries in 2025 with the lowest water resources per person (~972 cubic metres/year).

As a result of insufficient precipitation and uneven distribution, there is heavy reliance on irrigation. According to model-based projections, the water resources in the Kura River are expected to decrease by 10 percent over 2020–2040, 15 percent over 2041–2070, and 20 percent over 2071–2098 (MENR, 2021). Currently, more than 90 percent of crop production in Azerbaijan is produced on irrigated lands. Accordingly, any reduction in water resources due to climate change may put serious pressure on agriculture.

The extensive production method is commonly used for animal husbandry. However, despite an increase in numbers of livestock and poultry, fodder production in the country is very weak and alfalfa production is preferred in irrigated areas. No changes have reportedly been made to the composition of animal feed to reduce greenhouse gases (GHGs). Moreover, there is no manure management activity in Azerbaijan, resulting in a constant increase in GHG emissions in agriculture. Annual increases in livestock numbers also produce additional effects, such as the expansion of pastures, increased erosion and increased methane (CH₄) emissions.

Political, programmes and institutional actions. The Government of the Republic of Azerbaijan strongly recognizes the importance of agriculture and agribusiness to achieving economic growth and social stability in rural areas. Accordingly, the government has adopted a number of legislative acts, national policies, strategies and state programmes related to the environment, energy and climate to promote low-carbon, climate-resilient development, agricultural production, food safety and rural development in accordance with the 2030 Agenda for Sustainable Development and the Paris Agreement. Activities related to climate change mitigation and adaptation are reflected in almost all sectoral strategies, plans and national development programmes. Ensuring food security in the country and driving diversification beyond the oil and gas sector are also key aspects of state policy. Activities in this area have been expanded and measures taken to provide the population with the necessary quantity and quality of food on an undisrupted basis.

Conclusion.

The agricultural sector plays an important role in ensuring national food security. One of the main areas of state support is modernization of the agriculture and agribusiness sectors, with a particular focus on ensuring the innovative development of agri-food systems. This includes subsidies for agricultural production and the purchase of agricultural machinery and equipment, digitalization of marketing and supply chains as well as various incentives for the processing and sale of agricultural and food products.

Ensuring food security in the Republic of Azerbaijan is a key element of state policy, and is underpinned by social and political stability. Azerbaijan ranks 33 out of 116 countries on the global hunger index, with a score of 7.5, indicating a low level of hunger (GHI, 2021). This represents a significant improvement on 2000, when the country's global hunger index was 25.0, indicating serious hunger. This progress can be attributed to the development of specific programmes to reduce hunger created in partnership with FAO

and other United Nations agencies. A successful transition to sustainable food systems will allow Azerbaijan to meet its targets for SDG 2 related to hunger, food security and all forms of malnutrition.

Next steps. The Government of Azerbaijan has declared the following broad objectives for national food systems over the next decade:

- Achieve a future in which healthy and organic food is available, affordable and accessible to a growing population.
- Ensure the livelihoods of people working in agriculture and along the food chain.
- Contribute to the sustainability of the environment.

Recommendations to support agricultural development and transform national agrifood systems in Azerbaijan focus on the following priorities (National Pathway to Sustainable Food Systems by 2030):

- Ensure the full digitalization of the agrifood system and promote advanced technologies.
- Strengthen food safety and promote healthy diets.
- Combat climate change and disasters through the sustainable use of natural resources.
- Enhance food processing among small and medium-sized businesses and support the activities of small-scale farmers.
- Improve the quality of education and research, and strengthen collaboration between science and policymaking.
- Develop food systems in liberated territories and integrate them into national food systems.

Chapter 1. Rapid food systems assessments

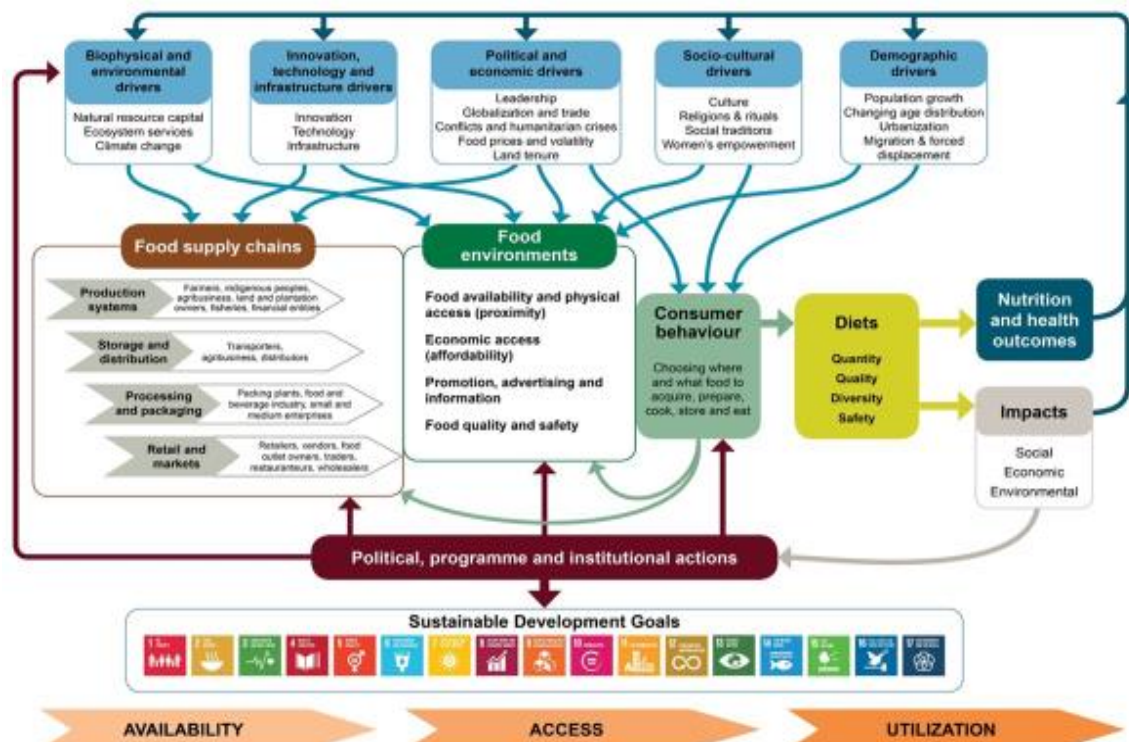
Creating sustainable food systems is critical to achieving the United Nations Sustainable Development Goals (SDGs), and means connecting discrete issues: livelihoods, climate resilience and biodiversity as well as nutritional status, access and affordability of healthy foods, and consumer preferences, among others. It requires understanding production, consumption and markets as interrelated parts of the same system, in order to identify synergies and trade-offs and potential pathways forward.

Traditionally, these issues have been studied and monitored in a segmented and partial manner. This approach fails to fully understand and assess food systems and their dynamics, especially as they occur in low- and middle-income countries, where these systems are changing fastest. In the absence of a complete picture, it is not possible to take effective decisions.

This Food System Country Profile consolidates and helps make sense of existing data to support more informed and evidence-based decisions; curb negative outcomes, such as malnutrition in all its forms, food loss and waste, and unsustainable environmental footprints; and improve food system sustainability. In so doing, it seeks to provide public and private sector decision-makers with a holistic and systemic overview of key components critical for the sustainability of the Azerbaijan national food system. It further aims to identify hotspots of unsustainability to enable prioritization of interventions at multiple scales.

The analysis is based on two recently developed frameworks: the 2016 Global Panel Report on Agriculture and Food Systems for Nutrition and the Committee on World Food Security's (CFS) 2017 High Level Panel of Experts on Food Security and Nutrition report *Nutrition and Food Systems*. Figure 1 illustrates this conceptual framework of food systems for diet and nutrition.

Figure 1. Conceptual framework of food systems



Source: HLPE (2017).

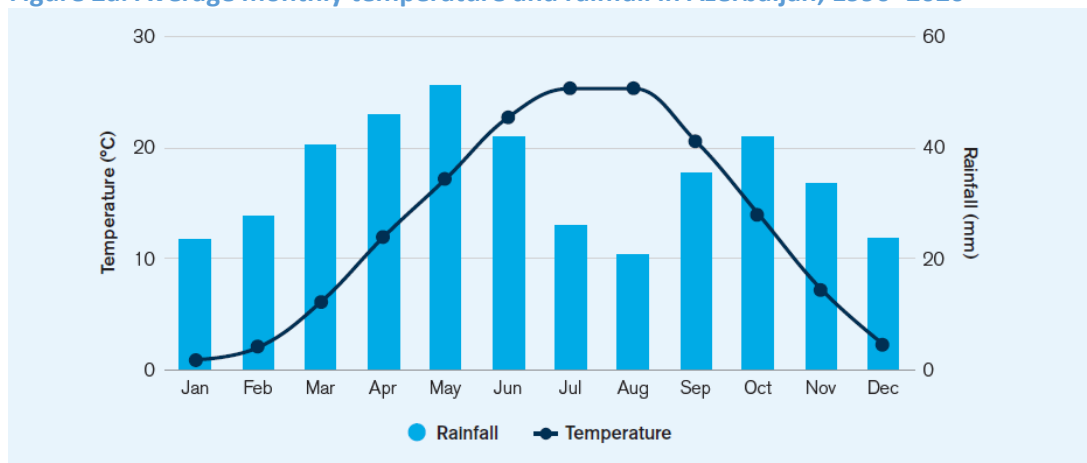
Chapter 2. Food systems drivers

2.1 Biophysical environmental drivers

Azerbaijan is characterized by a variety of climates, but is predominately subtropical. Recorded temperatures have reached a maximum of +46 °C and minimum of -32 °C. Of the 11 existing climatic zones in the world, nine are found in Azerbaijan, ranging from humid subtropical climate to semi-arctic. The country experiences hot summers (especially in lowland areas) and moderate winters. Average temperatures for 1991–2020 varied between approximately 24 °C in the summer months of July and August and -1 °C to 1 °C during winter (December to February).

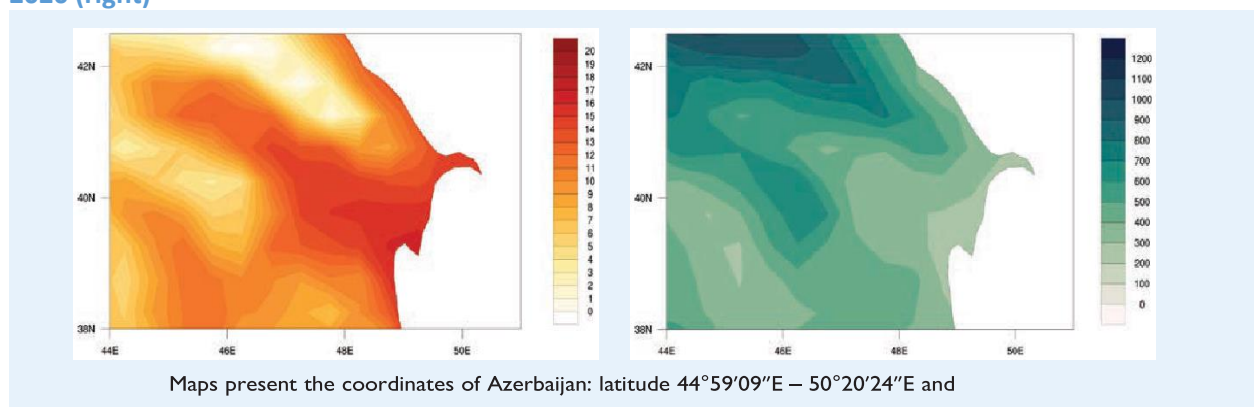
Average rainfall follows a bimodal distribution throughout the year, with average levels above 40 millimetres (mm) per month from April to June, and again in October. Precipitation is highest in May and June in the northern and western areas of the country, where it can exceed 100 mm in some locations. Conversely, precipitation in Baku remains below an average of 25 mm per month from January to September, and averages only 33 mm in the wettest months of October and November (Figure 2a and 2b).

Figure 2a. Average monthly temperature and rainfall in Azerbaijan, 1990–2020



Source: CCKP (2020).

Figure 2b. Annual mean temperature (°C) (left), and annual mean rainfall (mm) in Azerbaijan, 1990–2020 (right)



Source: World Bank Group and ADB (2021).

2.2 Innovation, technology and infrastructure drivers

Regional transport infrastructure in Azerbaijan is state-of-the-art and includes about 19 000 km of hard-surface roads, most of which have been built and constructed in the past ten years. The country has six international airports, with Baku operating the largest international airport in the Caucasus region. A new international port located in the Alat settlement, 60 km south of Baku, is now operational, and has an annual capacity of 10–11.5 million tonnes of cargo and 50 000 TEU (20 foot equivalent unit) – a measure of volume of large container ships – which is due to be increased to 21–25 million tonnes and 1 M TEU. In 2013, a new shipyard was commissioned on the shore of the Caspian Sea. There are over 2 000 km of operational railroads, and the “Iron Silk Way” Baku-Tbilisi-Kars trunk-railway system was launched in 2017.

Regarding digital infrastructure, about 85 percent of the population in Azerbaijan had access to and used the internet in 2020 (World Bank Group, 2020), while 71 percent used computers. The higher level of internet usage suggests that some online users rely solely on mobile phones for online access. Azerbaijan has one of the highest levels of internet access among peer countries. In 2017, the total capacity of “International Internet Channels” in the country was 770 000 Mbit/s, and the capacity of internet channels was 360 000 Mbit (ADB, 2019).

According to the *Global Competitiveness Report* of the World Economic Forum (WEF, 2017), in 2017–2018 Azerbaijan ranked 34th among 137 countries in the world for number of internet users, ahead of other countries of the Commonwealth of Independent States (CIS).

Mobile network coverage is high in the country. Although fixed broadband connectivity is 20 percent lower in rural than urban areas, rural areas in Azerbaijan are relatively well covered by mobile, with over 95 percent of the population covered by 3G or 4G mobile services. As is the case in many middle-income countries, mobile connectivity has become the main pillar of telecommunications in Azerbaijan and populations across the country are familiar with the technology. About 64 percent of households have access to a computer, while 40 percent of the population use mobile broadband services. In 2019, Azerbaijan ranked 70 out of 184 in the mobile cellular price basket of the International Telecommunication Union (ITU). The price of a monthly basket of voice calls and text messages was USD 8.80, or 2 percent of per capita income (ITU, 2017).

The government has developed public e-services but connectivity and knowledge constraints mean that these are not fully utilized in rural areas. The e-government portal (www.e-gov.az) offers 443 services that can be accessed online, with all ministries and most state agencies, as well as local executive authorities, offering services via this portal. In 2012, the government established the Azerbaijan Service and Assessment Network (ASAN) (www.asan.gov.az) under the State Agency for Public Services and Social Innovations, which reports to the Office of the President of the Republic of Azerbaijan. ASAN service centres aim to support all state entities in delivering services to citizens in an accessible and coordinated manner. Currently, 20 ASAN centres (public service halls) have been established of which five are in Baku and 15 are located in other regional centres.

2.3 Political and economic drivers

Azerbaijan is a politically stable unitary state with a population of 10.12 million citizens, which grows by approximately 100 000 each year. Categorized as an upper middle-income country, Azerbaijan has a per capita gross domestic product (GDP) income of USD 4 742 and is classified as “high” in terms of human development, with a Human Development Index (HDI) of 0.756, ranking the country 88th out of 189 countries globally (UNDP, 2020). Despite the collapse in global oil prices in 2020, Azerbaijan’s economy remains heavily dependent on oil revenues. Accordingly, the government is committed to diversifying revenues while improving the efficiency of public spending.

Located at the crossroads of Europe and Asia, Azerbaijan has a unique geopolitical and geographical position. It is the largest of the South Caucasus countries with a land area of 86 600 km² consisting of 12 percent of forests, 1.7 percent of water and 55.1 percent of agricultural lands, 30.5 percent of which are pastures and 31.2 are other types of land). The territory of Azerbaijan extends 400 km from north to south and 500 km from west to east. The Republic of Azerbaijan shares borders with five countries: the Russian Federation to the north (a border of)390 km, Georgia to the north-west (480 km), Armenia to the west (1 007 km), Turkey to the south-west (15 km) and Iran to the south (765 km). The length total of all borders is about 2 647 km. The eastern part of the country opens onto the Caspian Sea (an area of 825 km) (Figure 3).

Figure 3. Map of Azerbaijan



Source: United Nations Cartography.

Azerbaijan has experienced significant economic growth over the past 15 years, with GDP and foreign trade more than doubling in size. The highest GDP indicator of 34.5 percent was observed in 2006. In 2020, 33.7 percent of the country’s GDP was produced by industry. Meanwhile, agriculture, forestry and hunting produced 6.9 percent, transport and communication 9.1 percent, construction 9.7 percent and other fields 31.7 percent, with net taxes accounting for 9.7 percent (SSC, 2021b). Since 1995, investments worth more than USD 280 billion have been made in the country. Azerbaijan is ranked 28th by the World Bank’s *Doing Business Guide* (World Bank Group, 2020), and has a Gini coefficient of 27 for income (World Bank, 2005).

As of end-2020, Azerbaijan had one of the lowest foreign debts to GDP ratio (less than USD 9 billion) (World Bank Group, 2020). The country has undergone a significant economic transformation since independence, following the collapse of the economy with the break-up of the former Soviet Union, and the consequent drop in GDP, which by 1995 was less than half the 1990 level. By 2009, Azerbaijan had transformed itself into an upper-middle-income country, and as of 2020 had a GDP per capita of PPP USD 14 452 (World Bank, 2020). In 2018, the External Debt Ratio to GNI was 36.4 percent (2018) (ADB, 2020).

Azerbaijan’s official national poverty rate was recorded at 5.1 percent in 2018, having declined significantly from 49 percent in 2001 (World Bank Group, 2020). Given the recent increase in private consumption, estimates indicate that the poverty rate is likely to have fallen further in the years since. Azerbaijan is now classified as a high human development country by the United Nations Human Development Index, with a score of 0.756 in 2020.

The non-energy economy expanded by 1.8 percent over the period 2014–2018, reflecting dynamism in most economic sectors. Consumer price inflation reduced sharply in 2018, falling to 1.6 percent from 7.9 percent in 2017. Azerbaijan’s economy grew by 2.2 percent in 2019 – its best performance since 2014. On the supply side, the hydrocarbon sector has stagnated, as surging natural gas output – up by 27.7 percent year on year – was offset by a 3.3 percent fall in oil production.

At the same time, non-energy GDP grew by a solid 3.5 percent, with agriculture and services driving expansion. On the demand side, investment remained anaemic while rising real incomes, as a result of higher government spending, supported consumption (World Bank Group, 2020).

Well-established trade relations have ensured the transfer of modern technologies and best practices. In particular, transport and logistical hub capabilities have strengthened Azerbaijan’s position in Eurasia, while recent projects have made the country a commercial bridge between East-West and North-South transport routes, reinforcing commercial links and deepening cooperation between countries.

A number of achievements have contributed to political and economic stability in Azerbaijan:

- GDP and foreign trade have more than doubled in size over the last 15 years.
- Since 1995, foreign investments have amounted to more than USD 280 billion.
- Azerbaijan ranked 28th in the World Bank *Doing Business Guide* (2020).
- Azerbaijan has one of the lowest foreign debts as of the end of 2020 (less than USD 9 billion).
- Azerbaijan scored -0.7 on the Political Stability and Absence of Violence/Terrorism Index in 2018 (FAOSTAT).
- The country’s rail line density (total route in km per 100 square km of land area) is 2.5 (FAOSTAT).
- Value of food imports over total merchandise exports is 8 percent (average for 2015–2017) (FAOSTAT).
- According to FAOSTAT data, food supply variability per capita is 48 kcal/capita/day.

Azerbaijan is in the process of modernizing and digitalizing the agricultural sector. The Azerbaijani e-agriculture model aims to identify sustainable and inclusive pathways to accelerate the digital transformation of agrifood systems across the country.

Since 2020, the provision of subsidies to farmers for crop and livestock production is being managed through **the Electronic Agricultural Information System (EKTS)** in accordance with the “Rules for subsidizing agricultural production” (Decree of the President of the Republic of Azerbaijan No. 759 dated 27 June 2019). EKTS has been established under the Agrarian Research Centre. The E-agro database, which forms part of EKTS, contains information on all farmers operating in the country, as well as a register of suppliers of fertilizers, pesticides, seeds and agricultural machinery, cold storage and grain elevators.

A **Farm Data Monitoring System (FDMS)** has been established in Azerbaijan building on the methodology of the Farm Accountancy Data Network (FADN) system of the European Union (EU) – a first in the CIS. A survey is conducted among 3 500–4 000 farmers every year, and the collected data are entered directly into FDMS, the electronic database of the Agricultural Research Centre under the Ministry of Agriculture.

2.4 Social-cultural drivers

Azerbaijan is a unique place where different cultures and civilizations meet at the crossroads between East and West, North and South. The diverse population of this country is a remarkable and harmonious combination of traditions and customs of multiple origins. The peculiarities of Azerbaijan’s historical development, its geographical position and the national composition of the population have created favourable conditions for the spread of different religions and cultures: Christianity, Islam, Judaism and other beliefs have all become part of the fabric of the country’s religious and cultural life. This diversity is evident in Azerbaijan’s cultural heritage.

Historically known as the “Land of Fire” (“Odlar Yurdu”), Azerbaijan is among the most ancient centres of fire-worship. Numerous temples, relics and hundreds of incomparable historical monuments are scattered across ancient cities, making Azerbaijan one of the cultural centres of Islamic civilization. Baku, the capital, is known as “the city of winds” due to local weather conditions, and has also been called the “European marvel of the East” and “the place where East meets West” in reference to the fusion of Oriental and Western architectural traditions, visible in the local medieval fortress and European-style 19th-century architecture, and echoed in Soviet-era buildings as well as ultra-modern skyscrapers that shape the new image of the city today.

Meanwhile, in the Gobustan State History and Art Reserve, located 60 km from Baku, approximately 6 000 rock carvings are a testament to 40 000 years of human history. The site acquaints visitors with the lifestyles of former inhabitants, including ancient cooking traditions. The Gobustan State History and Art Reserve and the Walled City of Baku have both been declared UNESCO World Heritage sites (UNESCO, 2019).

Figure 4. The Walled City of Baku: the Maiden Tower and the Shirvanshah Palace



Source: az.wikipedia.org and aztc.gov.az.

Azerbaijan also has a rich and varied cuisine whose culinary arts are popular in many countries of the world, especially in the East. In particular, its food is renowned for local varieties of grapes and fruit, which have contributed significantly to the enrichment of national cuisine. Home cooking and eating have long served as a primary ethnographic feature of Azerbaijanis in both cities and rural areas.

Since ancient times, the meat of wild animals and cattle has been widely used in Azerbaijani national cuisine. In particular, the meat of young male sheep is considered a delicacy. Sheep tails and auxiliary products are also used in national dishes, while wild birds, goose, turkey, duck and chicken are widely used in meals. Diverse fish species of the Caspian Sea, the Kura and Araz rivers, and other lakes also enrich Azerbaijani national cuisine including meals prepared from fried, steamed and stuffed fish. Black, red and pressed caviar are widely used in festive family celebrations such as weddings. However, the most respected meal is pilaf (plov). In Azerbaijan, there are about 200 types of pilaf, and in some regions rice entirely replaces bread.

Statistical data for recent years show that the Azerbaijani population has begun to consume more bread, potatoes, vegetables and fruit, as well as meat. Each person in Azerbaijan consumes most of the basic foodstuffs included in the minimum consumer basket in excess of annual consumption norms. Meanwhile, the current level of consumption of potatoes, vegetables, melons, fruit and berries exceeds the standard level adopted in the country. The level of sugar consumption in the country is also above the norm, while the consumption of fish and fish products is below the norm.

Consumption of butter in the country is half the norm. In contrast, the consumption of vegetable oils is 164 percent of the norm, implying that the population substitutes vegetable oils for butter.

According to WHO recommendations, the daily recommended calorie intake of middle-aged people with an average range of mobility and exercise should be no more than 2 000 calories for women and 2 500 calories for men per day. Consuming a healthy diet throughout life helps prevent malnutrition in all its forms as well as a range of noncommunicable diseases (NCDs). However, increased production of processed foods, rapid urbanization and changing lifestyles have led to a shift in dietary patterns. The majority of the population prefers flour-based dishes, including cakes, national pastries, biscuits and potato chips. Moreover, add significant levels of butter and oils when cooking, which leads to increased consumption of calories a day.

2.5 Demographic drivers

Azerbaijan is the largest country in the South Caucasus with a population of about 10 119 000 people (SSC, 2021b). The proportion of the urban population is 53.0 percent while 47.0 percent live in rural areas. Some 36.4 percent make their living through agriculture, forestry or fishing activities (FAO, 2018a). The country is densely populated with about 105 people per km; the highest densities occur in the Absheron peninsula, with the lowest in the central highlands. In 2022, life expectancy at birth was 73.6 years (UNDP, 2022). The working age population in Azerbaijan is 4 389 665, which represents 43.38 percent of the total population (World Bank Group, 2020). Of the total population, 49.95 percent are men and 50.05 are women (World Bank Group, 2020). The average annual change in urban population is 1.58 percent (UNDESA, 2019). During the period 2015–2020, the National Annual Migration Rate was 0.01 percent (UNDESA, 2019).

Chapter 3. The core components of food systems

3.1 Food supply chains

The agricultural sector of Azerbaijan contributes 6.9 percent to the country's GDP and is also a key employer, providing employment for about 36.4 percent (1.772 million jobs) of the country's labour supply and generating two-fifths of household incomes in rural areas.

About 55 percent of the country's territory is used for agricultural purposes, including pasture and cultivated land. Of 4.8 million hectares of agricultural land, only about one-third is arable (SSC, 2020). Crop production accounts for 47.9 percent of agriculture while the proportion of livestock farming is slightly larger at 52.1 percent. The total gross output of agriculture in 2020 was estimated at AZN 8 428.9 billion of which AZN 4 028.4 billion was attributed to plant products and AZN 4 400.5 billion to livestock products. The value of food industry outputs has increased continuously – from AZN 7.03 billion in 2012 to AZN 9.72 billion in 2017 (USAID, 2020).

In terms of volume, 37 percent of food production consists of cereals, 33 percent of fruit and vegetables and 27 percent of dairy. Overall, the structure of production is more diversified in Azerbaijan.

3.1.1 Regional production distribution

Azerbaijan has a wide variety of climatic and land conditions that allow for the production of diverse crop types, ranging from Mediterranean (citrus, olives) to typical continental crops. The Aran region accounts for the largest proportion of crop production by total land area; the second largest in terms of area harvested for cereal production is the Sheki-Zagatala region. The quantity of other crops produced is higher than cereals in the Lankaran, Ganja-Gazakh, Nakhchivan and Guba-Khachmaz regions.

During the Soviet regime, which lasted for more than 70 years, the agricultural sector in Azerbaijan took the form of a planned economy, with farmers assembled into 983 collectives (kolkhoz) and 820 nationalized farms (sovkhoz). Following the transition period to a market economy, in 1996 it was reported that some 1.46 million out of 1.7 million hectares of land areas had been privatized following implementation of the Land Reform Act, creating approximately 800 000 small farms, which led to extreme land fragmentation.

The average land area owned by 372 000 producers who applied to the Ministry of Agriculture for fuel and engine oil subsidies was 3.0 ha, although the vast majority of producers owned even smaller land plots of 0.1 ha to 2 ha. Some enterprises operate larger farms the average size of which is 132 ha (World Bank, 2016). In 2017, there were 1 727 agricultural enterprises (joint stock companies, collective enterprises, cooperatives) and 955 individual entrepreneurs operating under the tax regime (USAID, 2020). However, it should be noted that most farms are small and poorly organized. This is a pressing issue with regard to increasing agricultural producing capacity and productivity indicators.

The situation is similar for cattle-breeding. According to the Ministry of Agriculture, the average head count of cattle per farm is 8, with about 82 percent of cattle farms having less than ten head of cattle.

The Government of Azerbaijan provides numerous incentives programmes for farmers, processors and traders engaged in the food supply chain for agricultural products. These incentives vary from tax and custom exemptions, to subsidies and discounts. In particular, they cover the purchase of fuel and motor oils, mineral fertilizers, wheat seeds, pedigree cattle and the insurance of crop and vegetable products. Azerbaijan is among the Top 20 global producers for main crops such as sour cherries, chestnuts, currants, hazelnuts, persimmons, figs and quinces.

The agricultural sector of Azerbaijan produces a wide variety of products, including cereals (wheat, barley, maize), potatoes, vegetables, fruits (including melons, grapes and berries), and livestock products such as milk, beef, sheep and goat meat, chicken and eggs.

According to FAO (FAOSTAT, 2021), the Azerbaijan Gross Crops Production Index (2014–2016 = 100) increased from 37.85 in 1995 to 129.2 in 2019. The gross livestock production index (2014–2016 = 100) increased from 39.13 in 1995 to 112.86 in 2019. Azerbaijan’s Food Production Index (2014–2016 = 100) increased from 37.14 (1995) to 113.36 (2018). Over the period 2010–2020, the agriculture sector increased its share in Azerbaijan’s GDP from 5.5 percent to 6.9 percent.

3.1.2 Livestock production

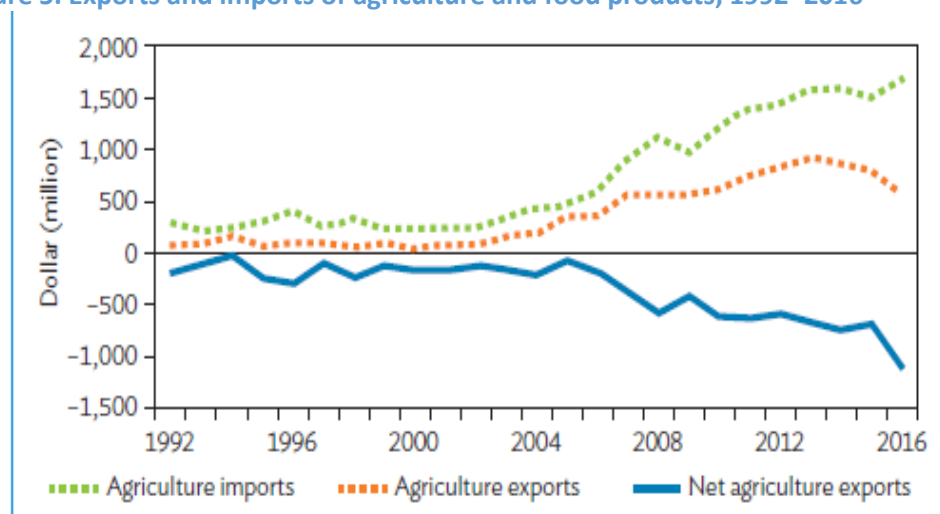
Value chains in the livestock sector receive government support covering all activities from input supplies to marketing, including improved forage, better nutrition of livestock, artificial insemination, and the development of irrigation infrastructure for pastures and grassland. These priorities were established to address the low productivity rates of the livestock sector and to improve the quality and quantity of livestock products. Currently, there are 2.7 million head of cattle and 8.6 million head of sheep and goats in the country, although low productivity is considered the main constraint for producers.

The main animal products in Azerbaijan are milk and eggs. The top three economic regions for egg production are Aran, Absheron and Lenkaran, which account for more than 70 percent of the total number of produced eggs. The top three economic regions for milk production are Aran, Ganja-Gazakh and Lenkaran, which account for around 70 percent of total volume.

The strategic location of Azerbaijan between two very large consumer markets – the Russian Federation (the largest importers of apples in the world) and the Middle East – makes Azerbaijan a suitable hub for export-oriented production. Over the last few years, the government has sought to increase this potential further by promoting nationally produced products through the “**Made in Azerbaijan**” campaign.

Since 2009, agricultural products have accounted for about 3.6 percent of total exports. The dollar value of Azerbaijan’s farm exports remained fairly constant in the decade from 1992 onwards, following transition to a market economy, and these exports have generally grown steadily since. Food and other agriculture imports rose from 15 percent in 2012 to about 19 percent in 2016. Overall, imports of agriculture and processed farm product have grown faster than exports since 1992 (Figure 5).

Figure 5. Exports and imports of agriculture and food products, 1992–2016



Source: FAOSTAT (for 1992–2013) and UN COMTRADE database (for 2014–2016).

It is not surprising that the international competitiveness of Azerbaijan’s agriculture and food processing exports was overwhelmed during the oil boom in the early 2000s. Agriculture’s share of GDP rose little in the period before and after the oil shock, accounting for 5.4 percent in 2011–2012 and 6.4 percent in 2015–2016. This pattern consistently shows signs of Dutch disease (ADB, 2020).

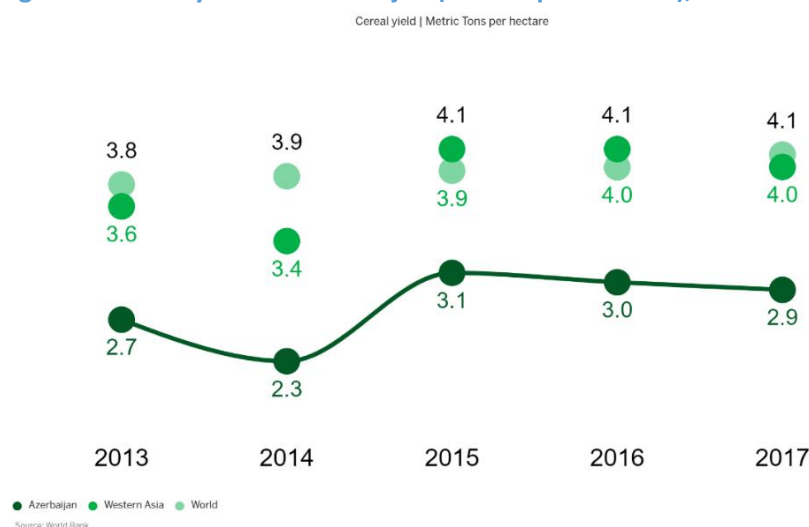
3.2 Food environment

After Azerbaijan gained independence from the Soviet Union in 1991, the value of the FAO per capita gross production index number (PIN) for agriculture in the country increased by about 70 percent (from 1992 to 2019), while the corresponding index for food doubled over the same period. Meat and milk production per capita also doubled, and the corresponding indices for roots and tubers and sugar crops increased 4.5 times and 13 times, respectively, over this period. In contrast, the per capita index for fruit and vegetables increased only about 65 percent over this period.

In 2018, availability of dietary energy was relatively high at 2 407 kcal/person/day, while availability of protein (three-year average 2017–2019) was 93.7 g/person/day and availability of fat (three-year average 2017–2019) was 66 g/person/day (FAOSTAT data).

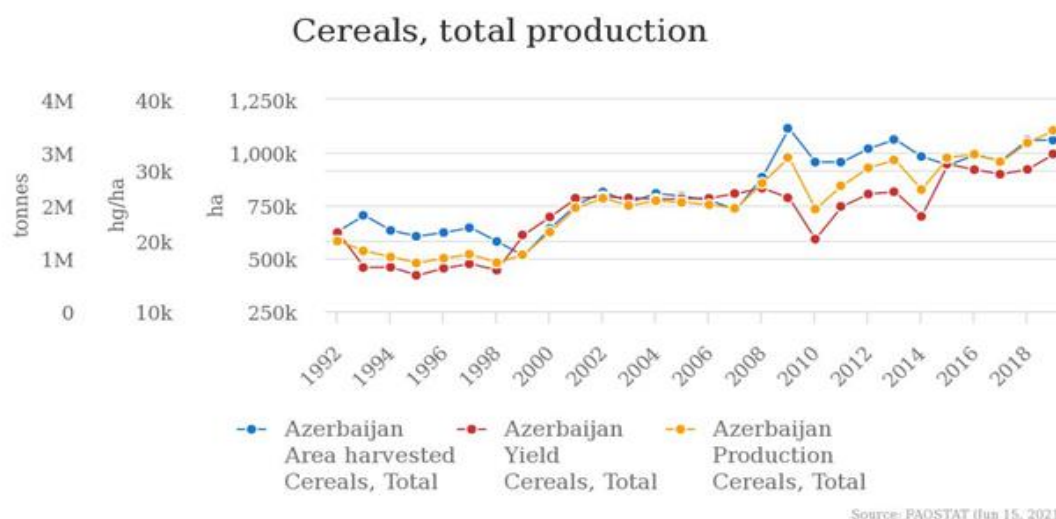
Since 2013, production trends for cereal crops have been positive (an average cereal yield is 2.9 tonnes per hectare), but lower than the world average of 3.9 tonnes per hectare, as shown in Figure 6 (Food Systems Dashboard, 2021). Cereals are used mainly for feed (barley and maize) and food (wheat and maize) consumption. Production of wheat and maize in Azerbaijan is lower than domestic use, implying that the country is a net importer of these two types of cereal. Azerbaijan is a small net exporter of barley.

Figure 6. Cereal yields in Azerbaijan (tonnes per hectare), 2013–2017



Over the last 15 years, crop areas have increased by over 50 percent, with a concomitant increase in the numbers of dairy cows and sheep and goats, while poultry numbers have risen by 90 percent. These numbers indicate that both the livestock and crop sector in Azerbaijan have expanded significantly over the period. Figure 7 shows the development of areas under crops in Azerbaijan since 1992.

Figure 7. Total production of cereals in Azerbaijan, 1992–2019



Source: FAOSTAT.

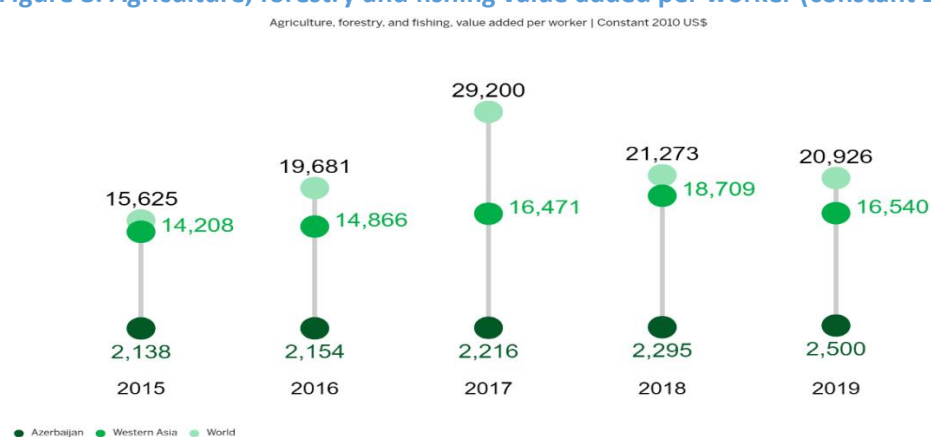
Total cereal production in Azerbaijan increased from 1 325 023 tonnes in 1992 to 3 416 765 tonnes in 2019. Meanwhile, cereal yields varied from 21 139 kg to 32 282 kg per hectare over the period 1992–2019. Over the same period the harvested area for cereals expanded from 626 829 ha to 1 058 396 ha.

Cereals and dried pulses are the major crops in terms of areas under crops (62.4 percent). In fact, cereal production comprises mainly wheat (55 percent), barley (35 percent) and maize (7 percent).

The Azerbaijan Gross Value of Agricultural Production increased significantly from USD 571 924 in 1995 to USD 3 412 456 in 2018 (FAO, 2018a). These numbers indicate that both the livestock and crop sectors have expanded over the period considered.

Over the period of 2015–2019, the value added per worker in agriculture, forestry and fishing increased from USD 2 138 to USD 2 500 (Figure 8).

Figure 8. Agriculture, forestry and fishing value added per worker (constant 2020 USD)

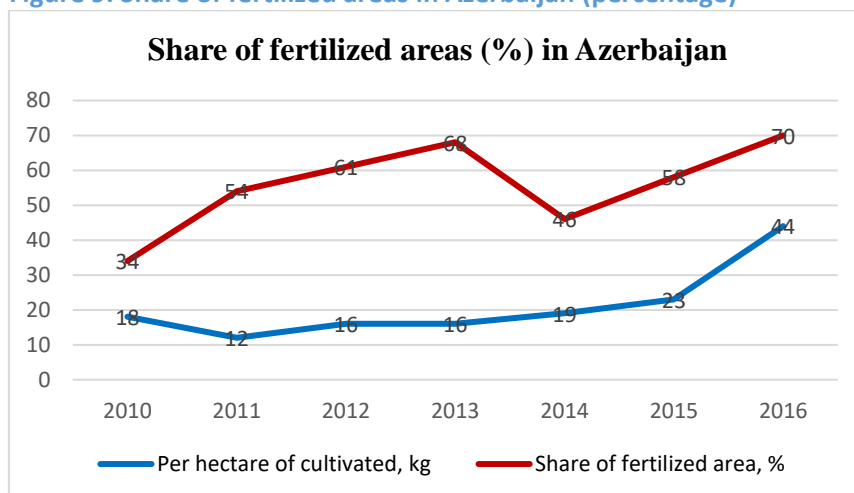


Source: Food Dashboard Systems (2021).

In Azerbaijan, agriculture has undergone substantial structural changes since the country gained independence from the Soviet Union and transitioned to a market economy. As of 2020, Azerbaijan had over 4.780.1 million ha of agricultural land of which only 1.631 million ha were sown (SSC, 2020).

Usage of fertilizers is increasing significantly in horticulture, with the application of fertilizers per hectare of cultivated land almost doubling in 2016 and the share of fertilized area during this year reaching 70 percent (Figure 9).

Figure 9. Share of fertilized areas in Azerbaijan (percentage)



The total area of crop fields has expanded continuously since 1990 due to the development of the private sector in agriculture and the application of extensive production methods. In 2019, the total area of crop fields (1 717 100 ha) in Azerbaijan increased by 17.4 percent compared to 1990 (1 462 500 ha) (SSC, 2020).

3.2.1 Food processing industry

Government efforts to diversify the economy include the development of the food processing industry. In the period 2005–2019, the Azerbaijan Gross Food Production Index increased from 74.86 to 121.65 (FAOSTAT data). The food processing industry of Azerbaijan is composed of four main sectors: meat processing, production of dairy products, production of beverages, and processing and canning of fruits and vegetables. This sector is characterized by a large number of small enterprises engaged in production, while a few medium-sized and large companies undertake packaging and retail distribution. In 2017, the share of food processing in overall manufacture industry in Azerbaijan was 7.4 percent with a decreasing trend from 2015 *in percentage terms* but increasing in value from AZN 2.3 billion to AZN 3 billion (USAID, 2020). In 2019, foodstuffs production was estimated at USD 2.1 billion and the cost of beverage production was valued at USD 254.8 million (SSC, 2020).

Azerbaijan’s agricultural exports are still relatively small and lagging behind world trends, with the structure of exports concentrated in fruit and vegetables. About 70 percent of the export share is made up of fruit and 28 percent of vegetables (Table 1). The Russian market is the main destination for exports.

Table 1. Most exported agricultural products (USD, million), 2016–2019

Food products	2016	2017	2018	2019
Tomato	94.2	151.6	177.4	189.3
Hazelnut	104.9	114.5	93.5	124.2
Persimmon	68.7	90.9	114.5	104.7
Sour cherry	22.9	23.2	38	42.2
Apple	23.7	30.9	38	40.1
Other fruits	11.8	13.8	17.8	26.8
Sugar	62.3	40.2	25.5	26.8

Potatoes	15.8	25.8	29.6	26.8
Cotton	68.7	90.9	114.5	158.5

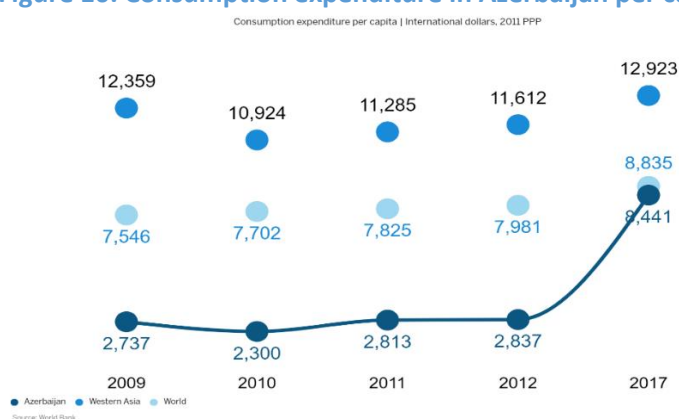
Source: State Statistical Committee of Azerbaijan.

3.3 Individual factors

Consumption expenditure in Azerbaijan increased from USD 2 737 in 2009 to USD 8 441 in 2017. Meanwhile, the proportion of household food and beverage consumption spent on meat and fish (all households) in Azerbaijan accounted for 20.0 percent (Food Systems Dashboard, 2017) (Figure 10).

The share of per capita monthly consumption expenditure for food is 43 percent across the country; however, this figure is declining gradually with the share of food products in monthly consumption expenditure decreasing by 25 percentage points over the last 20 years.

Figure 10. Consumption expenditure in Azerbaijan per capita (USD), 2009–2017



Agricultural trade increased 13 percent faster than average world growth over the period 2013–2018. Export is accelerating primarily due to increases in the fruit sector (from USD 170 million in 2013 to USD 330 million in 2018) and the vegetable sector (from USD 50 million in 2013 to over USD 200 million in 2018) (USAID, 2020).

Devaluation of the local currency has positively impacted the price competitiveness of Azerbaijan products in export markets, making the country more price competitive for agricultural goods in international markets. The Russian Federation is the dominant market for all exported agricultural products; however, there are signs of market diversification in the case of apples, berries, stone fruits and persimmon, following the lead of hazelnuts and pomegranate, which have already diversified their markets.

Imports and the trade deficit in agriculture have remained stable over the last few years at USD 1.7 billion in imports and a trade deficit of around 1 billion. A unique characteristic of Azerbaijan is that many products that are exported are also imported (USAID, 2020).

3.4 Consumer behaviour

3.4.1 Level of self-sufficiency with food products

In 2019, focused measures to ensure the availability of quality food products for the population resulted in a high-level of food self-sufficiency in regard to main food products (Table 3). This level of self-sufficiency improved due to the strengthening of local production capacity. At present, the level of self-sufficiency is 100 percent for fruits and vegetables, melons and eggs; 83.5 percent for meat and dairy products, and about 90 percent for potatoes. Consumption of butter in the country is half the norm. In

contrast, the consumption of vegetable oils is 164 percent of the norm, implying that the population substitutes vegetable oils for butter.

The share of bread production in total agricultural production is reported to be 8.8 percent. Bread is one of the main staples of the country's population – in 2020, 125.5 kg of bread were consumed per capita in Azerbaijan. In contrast, this figure is significantly lower in Germany at 57 kg, France at 50 kg, Italy at 44 kg and the United Kingdom at 37 kg.¹

The potato is another of the country's main agricultural products both in terms of food security and share in production. In 2020, some 82.2 kg of potatoes were consumed in Azerbaijan per capita. In contrast, consumption of potatoes was lower in Germany at 63.7 kg, Iran at 56 kg, France at 51 kg, Georgia at 50.4 kg and Turkey at 47.5 kg.² The share of potatoes in agricultural production was 4.7 percent.

In Azerbaijan, high levels of food waste are observed in particular at weddings, funerals and other customary celebrations, which take place at public wedding venues and ceremonial halls. This trend is underpinned by popular customs and traditions and a desire to keep up with neighbours and relatives. Additionally, consumers tend to buy products in large quantities or in batches, then refrigerate them for long periods of time, often resulting in spoilage (FAO, 2022).

Table 2. Level of self-sufficiency with food products (2019)

Food products	Level of self-sufficiency, percent
Beef	86.1
Mutton	97.6
Poultry	74.6
Eggs	101.8
Milk and dairy products	86.3
Butter	69.5
Cereal	67.3
Vegetables	112.0
Legumes	76.1
Potatoes	90.0
Tomato	132.5
Market garden crops	100.8
Fruit and berries	123.1
Grapes	94.3
Sugar and sugar products	75.0
Vegetable oils	33.6
Margarine	98.2

Source: State Statistical Committee of the Republic of Azerbaijan.

The last five years have seen positive trends in food consumption among the population. Potato consumption per capita increased by 21.1 percent, vegetable consumption by 17.2 percent, meat and meat products by 4.7 percent, egg consumption by 12.3 percent, fruit and berry consumption by 13.9 percent, and vegetable oil and margarine consumption by 12.2 percent. As a result, per capita bread consumption increased, milk consumption dropped by 13.0 percent, and sugar and confectionary consumption increased by 5.6 percent. Vegetable oil and margarine consumption also increased in Azerbaijan over the last few years.

¹ www.researchgate.net/figure/Per-capita-bread-consumption-in-several_tbl1_232740468

² www.helgilibrary.com/indicators/potato-consumption-per-capita/

Statistical data covering the last decade show that the diet of the population has improved through the consumption of other products. As noted earlier, the Azerbaijani population has begun to consume more potatoes, vegetables and fruits. Consumption of milk and dairy products first shows an upward and then a downward trend over the period 2010–2019. At the same time, consumption of protein-rich products such as meat, fish and eggs has increased (Figure 11).

Figure 11. Consumption of main types of food



Source: SSC (2021b).

Chapter 4. Food systems outcomes

4.1. Nutrition and health outcomes

According to the Global Food Security Index (2020), Azerbaijan ranked 56th out of 113 in terms of food security, indicating good performance. The country scored 63.3 for availability of food products, but 60.9 for quality and safety of food products – the weakest performing indicator. Conversely, the score for affordability of food increased to 75.9. The cost of meeting nutrient adequacy in food (as a percentage of household food expenditure on food and non-alcoholic beverages) is 32 percent. The average value of food production in Azerbaijan was reported to be USD 266 per capita (FAOSTAT data, 2020).

The proportion of micronutrient content (90.4 percent) is considered an indicator of the high quality of foodstuffs and of a healthy diet, underlining the safety of products, as noted in the food industry of the Republic of Azerbaijan. The average protein supply (three-year average 2017–2019) is 93.7 g per capita/day (FAOSTAT data, 2020). The share of dietary energy from cereals, roots and tubers (three-year average 2017–2019) is 58 percent (FAOSTAT data, 2016). Average dietary energy supply (three-year average 2019–2021) is 130 percent (FAOSTAT data, 2021).

Azerbaijan has no difficulties regarding food availability and produces major staples such as meat, vegetables and fruits (grapes, persimmon, apples, etc.) in sufficient amounts to be self-supporting. Nevertheless, food diversification presents a challenge. The middle class eats a significant amount of meat, chicken, rice and bread, while children, in particular, do not consume enough fruits and vegetables.

4.1.1 Stunting

According to the *State of Food Security and Nutrition in the World* (FAO, 2019b), between 2017 and 2019, undernourishment in Azerbaijan affected less than 2.5 percent of its population. The prevalence of stunting in Azerbaijan is 16.4 percent nationally and below the world average, and thus of low public health significance.

4.1.2 Wasting

In 2018, 3.2 percent of children under 5 years old suffered from wasting. The national prevalence of underweight in Azerbaijan is considered as of “low” public health significance according to WHO classifications, with 7.3 percent of new-born children born with a low weight in 2018.

4.1.3 Overweight, obesity and malnutrition

The prevalence of adult obesity rose in all Europe and Central Asia (ECA) countries between 2012 and 2016, by an average of 8 percent, with no countries on track to meet the 2025 and 2030 FAO targets (FAO, IFAD, UNICEF, WFP and WHO, 2020). Indeed, recent WHO findings indicate that prevalence of obesity is either rapidly increasing or stabilizing at very high levels in almost all European countries, while dietary behaviours remains far from optimal. In 2019, the prevalence of overweight among children under 5 years old was 10.4 percent and 19.9 percent of adults in Azerbaijan were obese. These levels are significantly lower than in other countries of the region and in the world, but still constitute an emerging health issue, with overeating and unhealthy food a growing trend. Preventive measures should therefore be taken to avoid serious problems in the future.

4.1.4 Anaemia

Azerbaijan faces high levels of anaemia, particularly among women of reproductive age (15–49 years old), 36.8 percent of whom suffer from high levels of anaemia with implications for themselves and their new-

born child. This trend is the consequence of insufficient and inadequate food relative to the special needs of pregnant and lactating women (FAO *et al.*, 2021). Prevalence of adult diabetes in Azerbaijan in 2010–2014 was 13 percent in females and 12 percent in males. Meanwhile, the proportion of adults with elevated blood pressure (systolic and/or diastolic blood pressure \geq 140/90 mmHg) in 2011–2015 was 23 percent in women and 26 percent in men (IFPRI, 2015).

4.2 Socio-economic outcomes

4.2.1 Costs of healthy and energy sufficient diets in Azerbaijan

According to the *Regional Overview of Food Security and Nutrition in Europe and Central Asia* (FAO *et al.*, 2021) average costs (converted to international dollars using purchasing power parity, or PPP) for the Central Asia and South Caucasus, in particular for Azerbaijan, are **USD 0.79, USD 1.79, USD 2.90** per person per day for energy sufficient, nutritionally adequate and healthy diets, respectively. Based on the results shown in Table 3, it can be concluded that the costs of healthy and energy sufficient diets are about 3–4 percent lower than the world average costs of USD 0.79, USD 2.33 and USD 3.75, respectively.

Table 3. Cost of three diets in the Caucasus and Central Asia regions, 2017 (PPP, constant 2017 USD)

Country/Group	Energy sufficient diet	Nutrient adequate diet	Healthy diet
Central Asia and Europe	0.84	2.04	3.39
Kazakhstan	0.65	1.64	3.07
Kyrgyzstan	0.96	2.29	3.72
Tajikistan	0.91	2.2	3.36
Belarus	0.8	2.01	4.2
Republic of Moldova	0.71	1.57	2.96
Russian Federation	0.62	2.27	3.4
Caucasus	0.9	1.94	3.38
Azerbaijan	0.79	1.79	2.9
World	0.79	2.33	3.75

Source: FAO *et al.* (2021).

4.2.2 Current consumption patterns

It should be noted that Azerbaijan like many countries in Europe and Central Asia does not have national food-based dietary guidelines. To this end, the first step in the formulation of national food security and nutrition strategies should be the development of guidelines that respond to Azerbaijan’s’ priority nutrition and health concerns and which reflect food availability, dietary customs and cultural practices while adhering to the latest scientific principles of good nutrition and diet-health relationships.

4.2.3 Diets

The share of energy intake from cereals, tubers and roots accounts for 61 percent of dietary energy in Azerbaijan. Regarding fruit and vegetables, Azerbaijan, like all countries in the region, has access to well above the 400 g per day recommended by FAO and the World Health Organization. Compared to the world average, large gaps exist in regard to the availability of pulses (peas, beans, lentils, chickpeas and others), the proposed minimum for which is 50 g per day, resulting in a diet low in legumes. The productivity and profitability of pulses, which represent an excellent source of vegetable protein, therefore needs to be improved.

To assess dietary patterns in Azerbaijan, eight food groups were selected. Three of the food groups are plant-based (fruits, vegetables and pulses) and four are animal-based (red meat, poultry, fish and milk), with vegetable oils rounding out the list (Table 4).

Table 4. Availability for consumption (g/capita/day) of important food subgroups in Azerbaijan, 2003–2017

Food groups	2003–2007	2008–2012	2013–2017
Fruits	146	182	221
Vegetables	454	467	445
Vegetables oils	12	7	9
Pulses	2	3	2
Four plant-based groups (excluding cereals)	614	659	677
Milk	278	368	406
Poultry	13	25	32
Red meat	92	130	147
Fish	7	7	7
Four animal-based groups	390	530	592

Source: FAO et al. (2021).

Availability for consumption of the four plant-based food groups (except for cereals) increased significantly over the last five year period shown compared to the previous decade. The data indicate that availability of all four plant-based food groups in Azerbaijan increased during the 2003–2017 period from 614 g to 677 g/capita, while decreasing in the European Union. In Azerbaijan the availability of fruit, vegetables and vegetable oils is closer to or higher than the world average, while the availability of pulses is much lower. In contrast, for the European Union, availability of fruit and vegetable oils was much higher than the world average in 2013–2017, but the availability of vegetables and pulses was much lower. The availability of fruits in Azerbaijan is above 200 g/per day.

Fruits and vegetables are an important part of a healthy diet, as they provide most, if not all, of the micronutrients (vitamins and minerals) required for health maintenance and mental and physical growth and development. FAO and the WHO both recommend daily consumption of at least 400 g of fruits and vegetables. The *EAT-Lancet Commission* report (Willett et al., 2019) provides a guideline of 200 g (target range 100 g to 300 g) for fruits and 300 g (with a range of 200 g to 600 g) for vegetables – a total of 500 g – for a healthy diet. The availability of fruit and vegetables for consumption in Azerbaijan is therefore well over the threshold recommended by the WHO for a healthy diet in all countries of the Europe and Central Asia.

Animal-based diets are less efficient in terms of resource usage during production and can contribute to greenhouse gas emissions that exacerbate the impacts of climate change. However, as stated in *The State of Food Security and Nutrition in the World 2019*, increased availability of meat may have positive or negative implications for health. For example, a small increase in meat in most low-income countries can fill the much-needed nutritional deficiency, while the high consumption of red and processed meat can be unhealthy as it can lead to diet-related health risks.

The average estimates for availability of the four animal-based food groups (red meats, poultry, milk and fish) for Azerbaijan (as shown in Table 5) show positive growth over the entire period from 2003–2007 to 2013–2017. Availability of all four animal-based food groups increased from 2003–2007 to 2013–2017 (poultry in particular). Like many countries in the European and Central Asia region, Azerbaijan showed higher availability of milk and red meat but lower availability of fish and poultry. Availability of fish over the period 2013–2017 was extremely low compared to the world and EU average, with fish and fish products accounting for a mere 2 percent of the country’s food market. However, an increase has been observed with per capita consumption of fish products rising from 1.7 kg per annum in 2007–2008 to 7.6–7.7 kg in 2016–2017. This is a consequence of increasing imports of food products and growth in

aquaculture production during 2011–2017. Currently, the demand and needs of the Azerbaijan population are met mainly by fish products imported from other countries (up to 70–90 percent) (FAO, 2013). Availability of poultry in Azerbaijan has risen since 2000, and was in the range of 25–32 g during the 2008–2018 period. The standard for optimal intake of poultry is 29 g (with a range of 0–58 g) – exactly the same as the weighted average in Azerbaijan. Regarding availability of red meat, Azerbaijan surpasses the recommended limits by a huge margin, as the range of red meat availability per capita spans from 92 g to 147 g per day, while the levels of red meat consumption are much higher.

According to the EAT-Lancet Commission’s 2019 report, the suggested target range for red meat intake is from 0 g to 28 g per person per day, with a midpoint of 14 g as a reference target. Conversely, the Global Burden of Disease 2017 report considers the risk factor of red meat in diets to be high, and the optimal level of intake is determined to be 23 g (with an optimal range of 18–27 g).

Consumption of milk in Azerbaijan stands at 276 g, relatively higher than the recommended levels of 250 g (with a range of 0–500 g) given by the EAT-Lancet Commission and 435 g (with an optimal range of 350–520 g) given by the Global Burden of Disease 2017 study.

For fish, scientific studies show that high intakes of fish are strongly associated with good health outcomes (FAO, 2019a). However, despite the positive trend in fish intake, the availability of fish, at 7 g, is lower than the recommended standard of 28 g (range of 0–100 g) given by the EAT-Lancet Commission.

Using the recommended standards by FAO and WHO for healthy diets, it can be concluded that for the ECA-15 countries (Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, North Macedonia, Moldova, Serbia, Tajikistan, Turkmenistan and Uzbekistan), the aggregate average consumption of red meat and milk is above the standards of optimal intake, while the consumption of poultry is equal to standards and the consumption of fish is below.

It is therefore important to increase fish consumption in Azerbaijan and reduce consumption of other animal-based foods to improve healthy diets and reduce the prevalence of obesity and the risk of non-communicable diseases.

4.3 Environmental outcomes

Azerbaijan’s landscape is characterized by a high level of agro-climatic diversification, encompassing 9 of the 11 world’s climatic zones, from semi-deserts to alpine belt. This environment allows Azerbaijani farmers to grow a wide range of crops, from wheat to Mediterranean fruits. However, the level of annual rainfall is relatively low over most of the territory, and farmers heavily rely on irrigation.

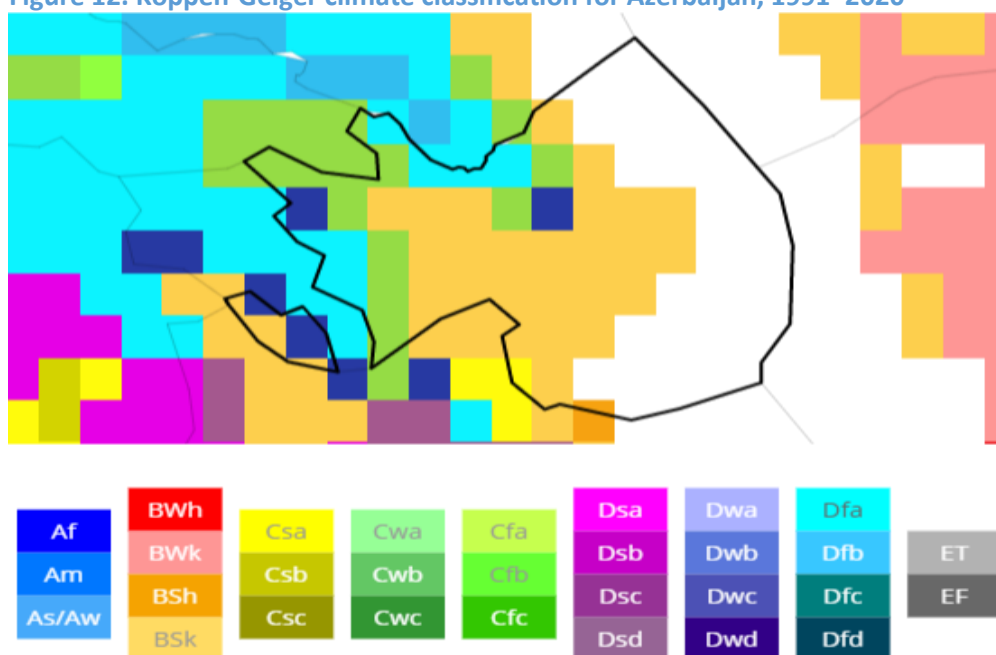
Agriculture has traditionally been an important part of the economy of Azerbaijan. Rural populations are therefore highly vulnerable to any climatic event that affects the agriculture sector. Climate change is a phenomenon that could trigger greater severity and frequency of the types of events that currently challenge agricultural production, including heat waves, floods and droughts, as well as changes in overall temperature and precipitation regimes that affect crop and livestock productivity. At the same time, climate change may create opportunities, particularly in agriculture. Increased temperatures can lengthen growing seasons for some crops, higher carbon dioxide concentrations may enhance plant growth, and, in some areas, rainfall and the availability of water resources may increase as a result of climate change.

Adaptation planning is therefore challenging due to the uncertainties in climatic developments and their locally specific impacts, which makes it difficult to identify optimal changes in agricultural systems.

The implications of climate change, even when looking ahead only about five to ten years, project a dramatic expansion of the arid regime in Azerbaijan, particularly in the central area of the country (Figure 12). Warm temperate and snow regimes cross national boundaries throughout the region, and

these transitional areas with similar climates could be identified as good candidates for adaptation measures.

Figure 12. Köppen-Geiger climate classification for Azerbaijan, 1991–2020



Source: CCKP (2021).

The typical agricultural system in Azerbaijan is subsistence or semi-subsistence mixed crop production integrated with small-scale livestock production. In fact, livestock production has long been an important component of agricultural economies across the region, and is often dependent on communal grazing lands that are usually degraded in terms of both land and vegetation due to overgrazing and consequent soil erosion. Azerbaijan also relies heavily on irrigation for high-value crop production, with the agriculture sector the largest consumptive user of water by far according to FAO’s AquaStat (FAO, 2008).

4.3.1 Water resources

Located in an arid zone, Azerbaijan has limited water resources. According to the Amelioration and Water Management Open Joint Stock Company (OJSC) of the Republic of Azerbaijan, the volume of surface water is 32.2 billion m³, decreasing to 22.6 billion m³ in years of drought, with some 70 percent originating from other states. Azerbaijan is forecast to be one of the 13 countries in 2025 with the lowest water resources per person (~972 cubic metres/year) according to estimates of the World Water Resources Institute.

Water shortages in years of normal rainfall are estimated at 3.7 billion m³. However, this number can be as high as 4.7–5 billion m³ in years of insufficient precipitation. The Kura River Basin has experienced several environmental water issues, such as insufficient water flows, poor water quality, lack of resilience to extreme events and ecosystem degradation (UNECE, 2015; World Bank, 2015).

The change in climate is expected to exert pressure on water resources. Surface water is predicted to decrease by 23–25 percent from 2021 to 2050, with water resources estimated to decrease by 29 percent from the baseline year level (1961–1990) from 2071 to 2100. These changes reflect a combination of changes in precipitation and temperature (temperature increases cause drying via evaporation).

Temperatures in Azerbaijan are projected to rise at a faster rate than the global average. The strongest warming is expected to occur during summer months, with average temperatures between July and September projected to rise by almost 6 °C by the 2090s. According to forecasts compiled by local

climatologists through various programmes, the average annual temperature increase in the country in 2021–2050 will be 1.5 °C–1.6 °C. As a result, the temperature rise in the first half of this century could be about 0.3 °C every ten years. This could lead to water shortages three to four times higher than in the baseline year (World Bank and ADB, 2021). According to official statistics, more than 90 percent of crop production in Azerbaijan is produced on irrigated lands. In this regard, reduction of water resources due to climate change may put serious pressure on agriculture.

Agriculture is the largest water user in Azerbaijan, responsible for usage of 70–75 percent of the country’s water resources. The impacts of water degradation on productive processes have been assessed using the “change in productivity” method (i.e. evaluated by estimating the loss in yield entailed by environmental degradation). According to the World Bank (2013), salinity is caused by over-irrigation and lack of drainage. Table 5 shows the extent of salinity in irrigated areas in Azerbaijan (World Bank, 2013).

Table 5. Extent of salinity in irrigated areas

Salinity of irrigated area	Area (ha)	Percentage (%)
Non-saline	564 700	38
Slightly saline	406 300	27
Moderately saline	292 300	20
Strongly saline	477 600	32
Very strongly saline	319 000	21
Total	1 495 200	100

Source: Azerbaijan Geological Atlas (2011) cited in Review of World Bank Engagement in the Irrigation and Drainage Sector in Azerbaijan (World, Bank, 2013).

The total damage costs of water degradation are in the range of **0.92–1.60 percent of GDP for the Kura river basin (USD 482–832 million in 2017)**, with health costs accounting for more than 40 percent of total damage, and agricultural yield loss for almost a quarter of total losses (high estimates). Water degradation costs are in the range 1.04–1.63 percent of GDP for Azerbaijan, and between 0.61 percent–1.01 percent for Georgia (Paccagnan, 2018).

The amount of more than 19.76 billion cubic metres (BCM) (72 percent of total water resources) outstrips by far internally produced water resources (28 percent). According to FAO (2008), Azerbaijan ranks **16th** in the world for water dependency ratio.

The Intergovernmental Panel on Climate Change (IPCC, 2021) forecasts a temperature rise of 2.5–2.7 °C over the next century, which would have a powerful negative effect on biodiversity and food production. Rising temperatures and global warming have a direct impact on the agricultural sector and food systems.

Irrigation

The total irrigated area in Azerbaijan was 550 000 ha in 1913 and has increased to 1.43 million ha by 2010 (FAO, 2018b). Withdrawals linked to agriculture amount to 10.1 BCM per year out of a total withdrawal of 11.97 BCM, more than 84 percent of which is used by the agricultural sector.

Azerbaijan presents a very dynamic population trend, with numbers increasing by 25 percent between 2000 and 2020. Over the same period, internal flows and inflows of water from other countries fell sharply. As a result, renewable water resources (RWR) per capita decreased dramatically by 40 percent between 2000 and 2017 (EEA *et al.*, 2020).

Like other countries in the region, Azerbaijan is facing severe water stress conditions, with an annual average water exploitation index above 40 percent (e.g. 72.3 percent in 2017). As a result of climate conditions, only a quarter of total precipitation contributes to internal flows in the country’s water resources. Accordingly, annual average RWRs are declining. In 2000, they were 23 000 million m³, falling to only around 17 000 million m³ in 2017. In Azerbaijan, the agriculture sector creates the highest water

demand. Irrigation accounts for 90 percent of total water abstraction every year, watering around 4.8 million ha of agricultural land, mainly in the lowlands of the Kura and Araz basins. In general, agricultural land occupies 55 percent of the total country area with no significant change in extent over time. Between 2000 and 2017, water abstraction increased by 12 percent while RWRs decreased by 27 percent.

Azerbaijan has very high rates of water use for irrigation. In 2017, water intensity in crop production was around 14 000 m³/ha (State Statistical Committee of the Republic of Azerbaijan, 2019). Under similar climate conditions, water intensity in crop production in southern European countries ranges from 5 000 m³/ha to 7 000 m³/ha. The available literature suggests almost 40–50 percent of water is lost in irrigation conveyance systems (Lohr, 2018)

The Kura and Araz, large rivers which flow into Azerbaijan, play a significant role in the country's overall water balance. In addition, Azerbaijan has 140 reservoirs of which only three have volumes larger than 1 000 million m³. The Mingachevir reservoir on the River Kura is the largest, with a capacity of 15 700 million m³. Water from this reservoir is also used for power generation and irrigation. Water scarcity conditions are increasing in Azerbaijan, requiring the rapid implementation of climate change adaptation measures, as well as greater efficiency in water use across economic sectors (EEA *et al.*, 2020).

Land resources

According to the State Statistical Committee of the Republic of Azerbaijan, agricultural lands account for 55 percent or 4.74 million ha of the total of 8.64 million ha of land resources in the country. Crop fields account for 1.8 million ha of agricultural lands. Azerbaijan is therefore among the group of countries with limited land resources: per capita land is 0.46 ha, while per capita land suitable for agricultural production is 0.19 ha. The per capita area of pastures and hayfields is even smaller.

Today, a total of 1 434 500 ha are irrigated in Azerbaijan, supplied with water through irrigation networks. Some 49 300 ha of the lands are pastures, meadows and forests. Hence, crop fields constitute 1 288 300 ha of irrigation lands, implying that 71 percent of crop fields are irrigated lands. Although existing land and climatic conditions allow for expansion of irrigation lands to 3.0–3.5 million ha, this is not possible at present due to limited water resources.

Extensive areas of Azerbaijan are severely impacted by soil erosion and salinization. It is estimated that 3.7 million ha (~42 percent of the territory) is subject to the damaging effects of erosion, while 0.6 million ha (~7 percent of the territory) is adversely affected by salinization, to the extent that it is now no longer suitable for agriculture. The salinization and erosion of soils tend to be a result of poor irrigation and drainage systems, overstocking of livestock, unsustainable levels of ground water extraction and ongoing deforestation. Land degradation is further exacerbated by the weak regulation of building and construction activities in Azerbaijan, as well as limited capacity for effective controls to mitigate the environmental impacts of industrial developments. Large-scale use of fertilizers, pesticides and herbicides has also degraded arable lands, caused mainly by uncontrolled imports of these chemicals as well as their poorly informed use by local farmers (MENR, 2019b).

4.3.2 Unsustainable levels of natural resource use

Land degradation in the grasslands and semi-arid areas of Azerbaijan is increasing at a rapid rate, largely as a result of overgrazing. Livestock husbandry in Azerbaijan is very profitable, so there is continual pressure to increase the size of livestock herds (mainly sheep, goats and cattle) well beyond the carrying capacity of vegetation. Recent monitoring of livestock shows that the number of animals per hectare is 10–50 times higher than the grazing norm in some areas, and even more in others. This is resulting in an incremental increase in both the extent of areas under grazing and the intensity of grazing pressure. The

intensive use of pastures in many areas – such as Absheron and Gobustan – is also resulting in accelerated soil erosion and the increasing desertification of land.

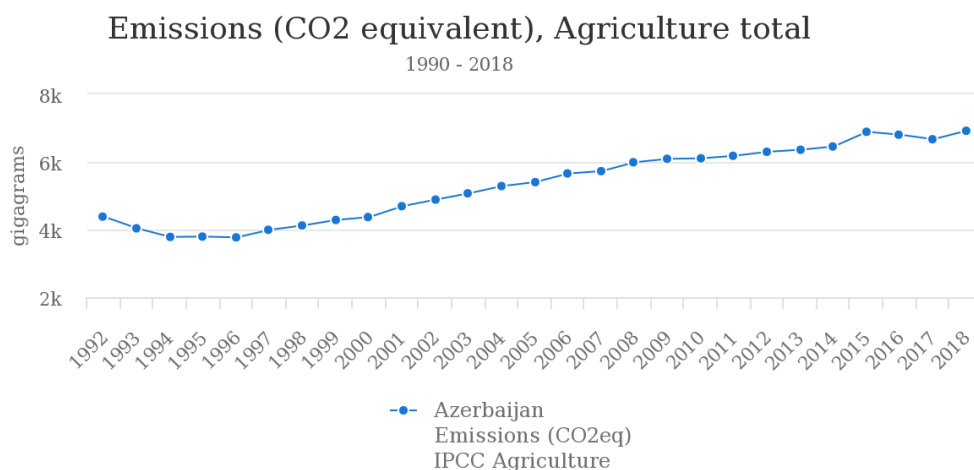
Over the past 20 years, aquaculture production in Azerbaijan has decreased significantly, from 1 700 tonnes per annum in 1990 to 539 per annum in 2019, while the cost of fish products has risen up several times over. In 1990, a total of 41 665 tonnes of fish were produced in Azerbaijan, while in 2000 total fish production was 18 937 tonnes (FAOSTAT data, 2017). The decline in fish production is caused by a decrease in catches of Caspian kilka due to the invasion of combjelly *Mnemiopsis leidyi*, overfishing and pollution (Daskalov and Mamedov, 2007; Mamedov *et al.*, 2016). In the 1990s, Caspian kilka catches amounted to more than 80 percent of total fish production in Azerbaijan (Mamedov *et al.*, 2016).

4.3.3 Emissions from agriculture, forestry and other land uses

Energy (75 percent) and agriculture (14 percent) are the two sectors that account for the largest GHG emission shares. The physical and geographical characteristics of Azerbaijan make it a highly sensitive country to the adverse effects of climate change, such as extreme weather events including flooding, drought and heat stress, all of which are expected to increase in frequency. Azerbaijan submitted an ambitious commitment in its first Nationally Determined Contribution (NDC) to achieve a quantitative target of a 35 percent GHG emission reduction by 2030 compared to 1990 (EU and UNDP, 2019).

In regard to GHG emissions trends for the sector, absorption and emissions increased year-on-year (Figure 13). This pattern is caused by the development of sub-sectors of plant-growing and cattle-breeding and an increase in the number of arable land plots and animals. The increase in absorption is linked to the expansion of forests and tree-planting, and the inclusion of agricultural orchard fields in the calculations based on the IPCC new methodology.

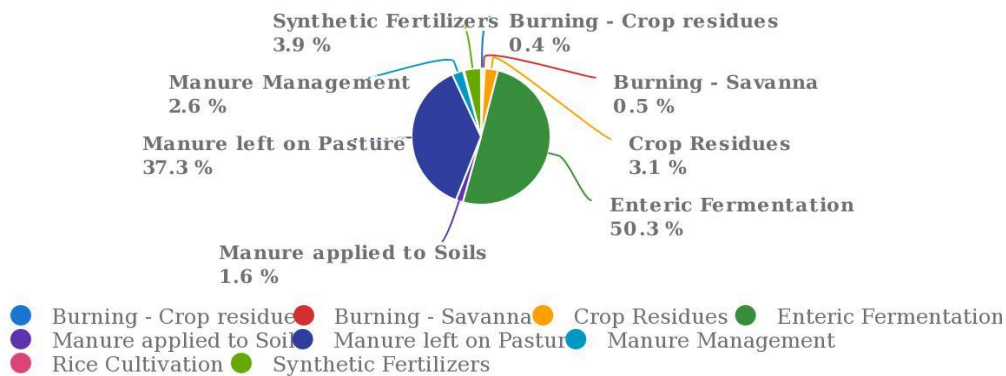
Figure 13. Agriculture sector emissions (CO₂ equivalent)



Source: FAOSTAT (Jun 19, 2021)

Emissions by sector (CO₂ equivalent)

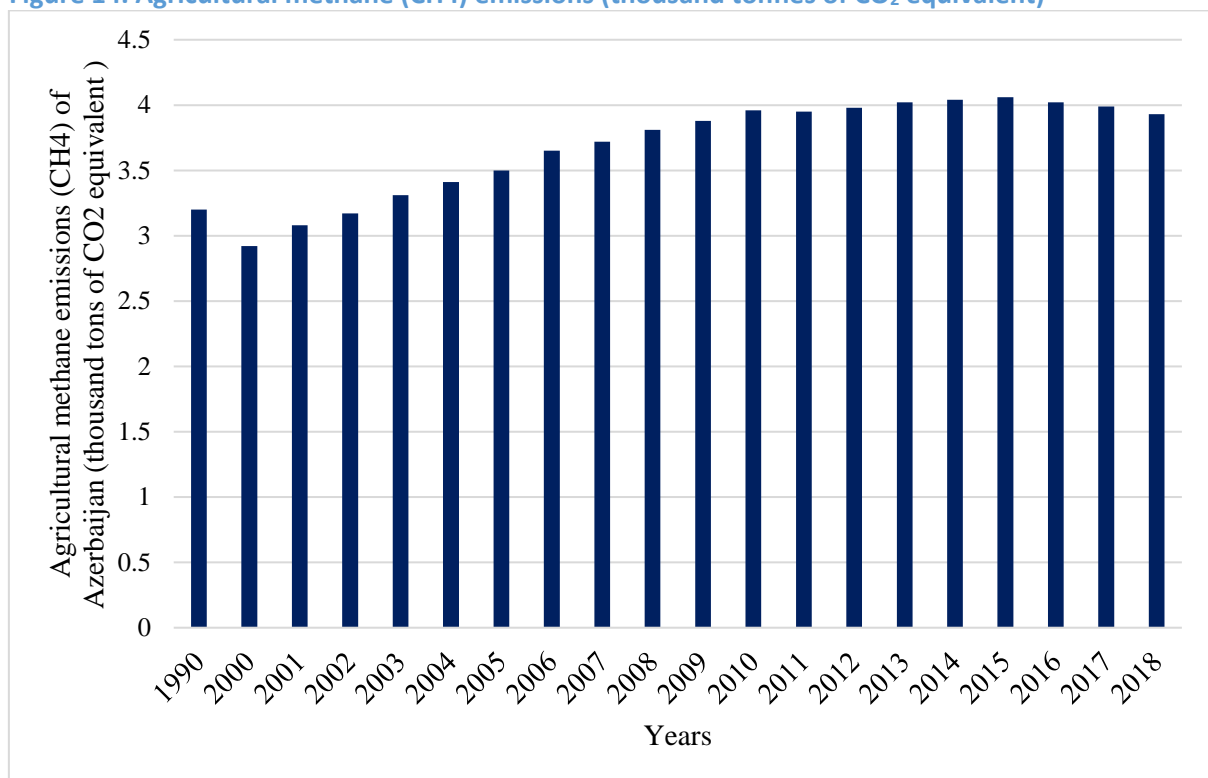
Average 1990 - 2018



Source: FAOSTAT (Jun 19, 2021)

Source: FAOSTAT.

Figure 14. Agricultural methane (CH₄) emissions (thousand tonnes of CO₂ equivalent)



Source: World Bank Data.

Over the period 1990–2018, methane emissions from agricultural activities in Azerbaijan increased by 750 000 kMt CO₂e from 3 180 to 3 930 kMt CO₂e. This rise can be explained by an increase in livestock numbers and the expansion of pastures (Figure 13 and Figure 14).

Cattle

The significant increase in the number of cattle in the Republic of Azerbaijan has played an important role in the rise in methane emissions (CH₄). Based on calculations, CH₄ emissions in agriculture have increased 51 percent between 1990 and 2016, while a decrease in cattle numbers in 1990–1994 likewise caused a reduction in CH₄ emissions. These trends were mostly observed during enteric fermentation and manure management (Table 6). The actual values of methane gas released into the atmosphere from enteric fermentation and manure management are given in Table 7.

Table 6. Methane emissions in livestock category (kt CO₂ eq.)

Indicator	1990	1995	2000	2005	2010	2011
Enteric fermentation	153.27	145.03	179.31	214.86	237.88	240.61
Manure management	11.89	11.51	14.37	17.44	19.49	19.72
Total emission (kt CO ₂ eq.)	165.16	156.54	193.68	232.3	257.37	260.33
Indicator	2011	2012	2013	2014	2015	2016
Enteric fermentation	240.61	243.62	245.97	245.76	246.76	246.23
Manure management	19.72	20.03	20.27	20.35	20.42	20.49
Total emission (kt CO ₂ eq.)	260.33	263.65	266.24	266.11	267.18	266.72

Source: MENR (2021).

Pastures

Pastures and hayfields cover up to 53.1 percent of arable lands in Azerbaijan (a total area of 2 423 000 ha according to the latest data published by the State Statistical Committee of Azerbaijan in 2020). These areas are mostly characterized by carbon saturation.

Pastures expanded continuously up to 2005 (from 1970 to 2005 the total area of pastures and hayfields increased to 414 000 ha). However, after 2005 the area of pastures and hayfields decreased to 161 000 ha in 2016, a trend that continued in 2017.

Annual increase in the number of agricultural animals has led to additional effects of livestock, such as the capture of new pastures, increased erosion and heightened methane gas emissions.

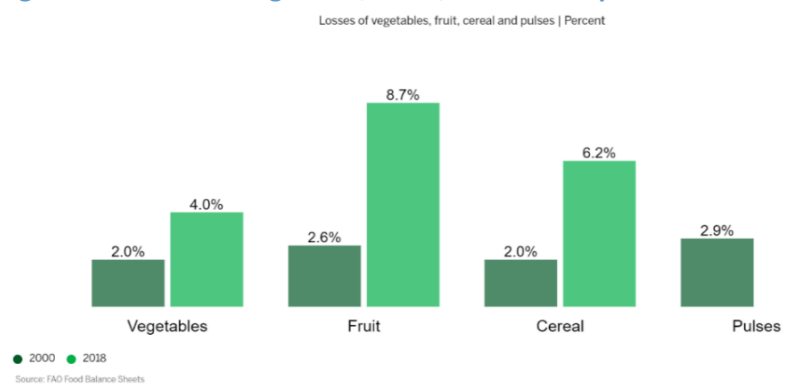
Food waste

In 2018, the most recent year with data available, 5.3 billion tonnes of food was available globally. A comparison with figures on food waste suggests that 17 percent of food available was wasted in three sectors: 10 percent in household, 5 percent in food services and 2 percent in retail. The FAO report *The State of Agriculture in the World* (FAO, 2019c) estimates that around 14 percent of global food production is lost during supply chain stages up to, but not including, retail. Over recent years a slight increase in losses of main crops compared to 2000 has been observed in vegetables (4.0 percent), fruit (8.7 percent) and cereals (6.2 percent) (FAO, 2018a) (Figure 15). According to the UNEP Food Waste Index Report (UNEP, 2021), household food waste in Azerbaijan is estimated at 93 kg/capita/year (934 872 tonnes/year). It is reported that approximately 25 percent of food products are wasted at consumer level on a monthly basis in Azerbaijan, resulting mainly from irrational usage of products (FAO, 2022). The latest available information on food losses, including data up to 2020, show that the food losses for crop products amount to 801 486 tonnes/year, for basic food products from industrial processing 57 789 tonnes/year and for livestock products 31 987 tonnes/year.³⁴

³ The State Statistical Committee of the Republic of Azerbaijan, Food Balances, Summary food balance of Azerbaijan in 2019, by crop products; Summary food balance of Azerbaijan in 2019 by livestock products; Summary food balance of Azerbaijan in 2019, by basic food products of industry processing. www.stat.gov.az/source/food_balances/?lang=en

⁴ The latest SSC waste report also includes food waste data up to 2019 (Environmental Protection, www.stat.gov.az/source/environment/?lang=en (last visited 18 May 2021), while FAO reports and balance sheets only reflect food waste statistics up to 2018 FAO FLW Report-Balance sheet 2018, Azerbaijan www.fao.org/faostat/en/#data/FBS/report; https://drive.google.com/file/d/13gYMF0HUQOx5_f6RnHGo1wC5ipcV4YCL/view?usp=sharing

Figure 15. Losses of vegetable, fruits, cereals and pulses in Azerbaijan (percentage)



Source: Food Systems Dashboard (2021).

Chapter 5. Food systems resilience

Azerbaijan can be divided into four agricultural zones based on the spatial distribution of elevation, agricultural lands, livestock pasture lands, temperature and precipitation. Figure 16 shows these four agricultural zones, which present significant differences in topography, temperature, humidity and precipitation from the surrounding region. The four zones are as follows: high rainfall (dark blue), irrigated (light blue), low rainfall (light green) and subtropical (dark green). The high rainfall region encompasses the majority of western and northern Azerbaijan. The central zone is irrigated, the east has low rainfall and the southeast is subtropical. The Nakhchivan Autonomous Republic is split between high rainfall and irrigated areas.

Figure 16. Agricultural zones of Azerbaijan



Source: ESRI online, DIVA-GIS, WWF Caucasus Region and IEc Analysis

Despite the country's significant agricultural potential, agricultural productivity and profitability vary widely across regions. The agricultural sector contributes 6.9 percent to GDP, but productivity remains low due to lack of modernization, low rainfall, scarcity of arable land, fragmented landholdings and serious degradation of natural resources in terms of water pollution, reduced water availability, soil erosion, salinity, and loss of soil fertility and organic matter.

Water availability is a major concern as rainfall is inadequate and unevenly distributed across the country, as is the case for water resources. As a result of insufficient precipitation and uneven distribution over the year there is a heavy reliance on irrigation. According to the United Nations Framework Convention on Climate Change (UNFCCC), droughts are likely to reduce water supply by 23 percent during the 2021 to 2050 period in the country. **According to projections made by the GFDL, HADGEM and MPI models, water resources in the Kura River in Azerbaijan are expected to decrease by 10 percent over 2020–2040, 15 percent over 2041–2070 and 20 percent over 2071–2098 (MENR, 2021).**

Due to a combination of political, geographic and social factors, Azerbaijan is recognized as vulnerable to climate change impacts, and was correspondingly ranked **73rd** out of 181 countries in the 2020 ND-GAIN Index (University of Notre Dame, 2020).

The physical and geographical characteristics of Azerbaijan make it a highly sensitive country to the adverse effects of climate change. As noted earlier, extreme weather events, such as flooding, drought and heat stress are expected to increase in frequency. A changing climate will also significantly impact the coastal zone.

Two primary types of drought may affect Azerbaijan: meteorological (usually associated with a precipitation deficit) and hydrological (usually associated with a deficit in surface and subsurface water flow, potentially originating in the region's wider Kura-Araz river basins). In combination with local land and crop management practices, these may also lead to agricultural drought. At present, Azerbaijan faces

an annual median probability of severe meteorological drought of around 2 percent, as defined by a standardized precipitation evaporation index (SPEI) of less than -2 (CCKP, 2020). The most vulnerable sectors in Azerbaijan are agriculture, human health, water resources, forestry and tourism.

Azerbaijan is expected to influence food production through direct and indirect effects on crop growth processes. Direct effects include alterations to carbon dioxide availability, precipitation and temperatures. Indirect effects include impacts on water resource availability and seasonality, soil organic matter transformation, soil erosion, changes in pest profiles and the arrival of invasive species, and decline in arable areas due land degradation and desertification. At an international level, these impacts are expected to damage key staple crop yields, even on lower emissions pathways. Tebaldi and Lobell (2018) estimate 5 percent and 6 percent declines in global wheat and maize yields, respectively, even if the targets of the Paris Climate Agreement are met and warming is limited to 1.5°C (CCKP, 2020; World Bank Group and ADB, 2021).

Chapter 6. Policy and institutional frameworks for food system sustainability

The Government of the Republic of Azerbaijan recognizes the importance of agriculture and agribusiness for achieving economic growth and social stability in rural areas. In recent years, the government has adopted a number of legislative acts, national policies, strategies and state programmes related to the environment, energy and climate in order to promote low-carbon, climate-resilient development, agricultural production, food safety and rural development in accordance with the objectives of the 2030 Agenda for Sustainable Development and the Paris Agreement. Activities related to climate change mitigation and adaptation are reflected in almost all sectoral strategies, plans and national development programmes.

Ensuring food security and driving diversification beyond the oil and gas sector are a key aspect of state policy in the Republic of Azerbaijan. Activities in this area have been expanded and measures taken aimed at providing the country's population with the required amount and quality of food on an uninterrupted basis. Activities have been implemented in three areas with a view to ensuring food security:

1. State support measures are being put in place to help entrepreneurs become self-sufficient and increase local production. These include subsidies, soft loans, tax and customs privileges, awareness raising and training.
2. The Food Safety Agency of the Republic of Azerbaijan has been designated the responsible agency for controlling the minimum quality and safety of food products.
3. Appropriate measures to ensure availability of quality food products for all segments of the population are being taken by the agencies responsible for implementing state social policy.

The government has established a "subsistence minimum", based on the minimum consumer basket, to be taken into account when determining pensions, allowances and social benefits. In addition, the Ministry of Economy conducts monitoring activities to prevent monopolies, avoid restrictions on competition, and ensure the distribution of markets and the application of agreed prices, which contributes to preventing increases of food prices in the consumer market, and takes measures in line with anti-monopoly legislation against the manipulation of prices, price discrimination and dumping.

On 6 December 2016, the President of the Republic of Azerbaijan signed a decree launching **the Strategic Road Maps on the National Economy Perspective and Main Sectors of the Economy (Strategic Road Maps)**. This national plan comprises 12 road maps – the Strategic Road Map on the National Economy Perspective and 11 sector road maps. The Strategic Road Maps outline the government's strategy for inclusive economic development for the period 2016–2020 (short-term) and proposed targets up to 2025 and beyond (long-term). The main stated objective for 2020 was to achieve widespread macroeconomic stabilization and to make the economy more resilient to future oil price shocks.

The stated long-term objective was to ensure greater diversification of the economy and to advance economic development through new drivers of non-oil growth. The long-term strategy also aims to further increase the country's competitiveness. These strategic visions implies a clear roadmap for the country to be implemented in consecutive steps to achieve strategic development targets in agriculture over the short and long term.

National development programmes set out government policies for agricultural, rural and agro-industrial development, based on efficient utilization of natural and economic resources, with the aim of building a sustainable national economic system integrated into the global economy. The main purpose of current state programmes for the development of the agriculture sector is to stimulate the development of agricultural production in order to meet growing demand for food in the country, increase exports of products, and boost employment and the livelihoods of the rural population.

In terms of carbon accumulation, the following state programmes may be considered important:

- Development of tea-growing (2018–2027)
- Citrus fruit development (2018–2025)
- Development of rice growing (2018–2025)
- Development of Azerbaijan silkworm breeding and sericulture (2018–2025)
- Development of the wine industry (2018–2025)
- Development of cotton growing (2017–2022).

The **State Programme on Poverty Reduction and Sustainable Development in the Republic of Azerbaijan for 2008–2015 (SPPRSD)** is the main strategic document addressing key development challenges in the agriculture, forestry and fisheries sectors. The strategic objectives consist of diversification of revenue sources for the population, improving the ecological situation and ensuring sustainable management of the environment, continuing institutional reforms and improving the public administration.

The Strategic Road Map of Azerbaijan on Agricultural Production and Agricultural Products Processing defines overall priorities related to strengthening the sustainability of food security, increasing production of agricultural products along the value chain, promoting sustainable natural resources management, developing market infrastructure and facilitating access of farmers to the market. This strategy provides a vision for 2020, 2025 and post-2025 timeframes on development of agricultural in the country, with a view to achieving medium- and long-term strategic development targets for the agricultural sector.

Azerbaijan ratified **the Paris Climate Agreement** in 2016. According to the 1st Nationally Determined Contributions (NDCs) (2017), the country has outlined climate change mitigation actions to be implemented in the energy, oil and gas, residential and commercial, transport, agricultural and waste sectors. The Paris Agreement calls on countries to revise and strengthen their NDCs every five years as urgent steps must be taken to reverse current unsustainable trends, leading to high expectations for governments to commit to ambitious pledges that leave no one behind. Azerbaijan's NDCs are currently under review and an updated set of NDCs is expected to be released in 2022.

In accordance with the NDCs, the Republic of Azerbaijan aims to strengthen measures and actions to combat climate change and has set a target of a 35 percent reduction in GHG emissions by 2030, compared to the base year of 1990, as a contribution to global climate change efforts.

The State Food Safety Programme for 2019–2025 was approved by the Head of State in 2019. Key steps are currently being taken to ensure the production of high-quality food products and their proper supply to the country's population. One of the main objectives is the provision of healthy and safe products, which will stimulate the production of organic products. Since the agricultural sector is a primary user of chemicals and mineral fertilizers, the production of quality products is considered a priority. This national policy incorporates a cross-sectoral approach.

The revised draft of **the State Programme for the Effective Use of Grazing Areas and Landscapes in the Republic of Azerbaijan for 2018–2020** is aimed at the effective use of pasture and hayfields and preventing their degradation, the creation of cultural grazing areas and extension of the practice of using grasslands in the form of parcels, preserving and enhancing productivity activities aimed at restoring pasture productivity through the use of specific grassland plants adapted to geographical conditions, preserving natural landscape and biodiversity, and ensuring sustainable development. In this regard, each farmer using grazing, pasture and haying area leased by local authorities is monitored in accordance with the requirements of the law and the terms of the lease contract. When distributing summer pastures to individuals who want to rent, the number of sheep and goats, grazing area, water supply, geographical location and other relevant factors are taken into account.

The **State Programme on Development of Agricultural Cooperation in the Republic of Azerbaijan for 2017–2022** was approved by the Order of the President of the Republic of Azerbaijan, and adopted in 2017. The main objectives of this programme include development of the agricultural sector, the efficient use of land and the creation of agricultural cooperatives as a form of joint farming to increase farmers' incomes. By providing significant support to small agricultural producers, cooperatives are reportedly increasing their access to a variety of services, resources, technology, credit and supply centres. In addition, the Strategic Roadmap for the production and processing of agricultural products identifies measures to create farmer partnerships and develop cooperation in agriculture.

The **State Programme on the Social and Economic Development of Regions for 2019–2023** aims to enhance achievements in the area of socio-economic development, especially in regional and rural areas, and to ensure the implementation of a “**Strategic Road Map**” to anticipate risks and enhance resilience to potential threats, thereby contributing to the SDGs and the Sendai Framework for Disaster Risk Reduction 2015–2030. In particular, the programme focuses on the protection of vulnerable people who depend on natural resources for their livelihoods and survival. Relevant activities include the improvement of hydrometeorological networks, agrometeorology for sustainable and economically viable agricultural production, reforestation, instalment of drip irrigation, identification of location and assessment of groundwater sources, and enhancement of people's environmental awareness.

The **National Strategy for the Protection and Sustainable Use of Biodiversity in the Republic of Azerbaijan for 2017–2020** promotes the sustainable use of genetic resources, the conservation of biodiversity for future generations, poverty alleviation, maintenance of ecological balance, ensuring transition to a “green economy”, promotion of environmental education, restoration of endemic and local fauna species, development of the protected areas network and reducing threats to biodiversity.

With the support of the FAO-Azerbaijan Liaison and Partnership Office and in close cooperation with the Ministry of Agriculture, a **draft National Land Consolidation Strategy (2018)**, a **State Programme on Land Consolidation with an Action Plan (2018)**, and a **Law on Consolidation of Agricultural Lands** were drafted and submitted to the Government of the Republic Azerbaijan for further implementation and adoption in 2019. Excessive land fragmentation and small/average farm sizes represent a significant structural problem impeding development and capitalization of the agricultural sector's potential. In addition, rural areas face major challenges in adapting to the impacts of climate change, in particular floods and droughts. In this regard, the government seeks to adapt climate-proof and water-resilient designs for rural areas, implying in many cases improvement in water retention and flood protection. Implementation of such spatial planning goals often involves changes in water management, leading to land consolidation. The above legislative instruments will function as the foundation of a future legal and institutional framework for land consolidation in the country.

The Ministry of Agriculture has prepared the **2021–2024 Sectoral Strategic Plan on the agricultural section of the state budget of the Republic of Azerbaijan**. The purpose of the Sectoral Strategic Plan is to ensure food security through the efficient use of existing natural economic resources in the country, to meet the needs of the industrial sector for raw materials and the needs of the population for food products through local production; and to boost agricultural production and employment in the regions in order to increase the export of agricultural products. The Strategic Plan also addresses environmental protection, the sustainable use of natural resources and management of climate change impacts on agriculture, and aims to implement the following measures in this regard:

- Create mechanisms to mitigate the adverse impacts of climate change and other natural phenomena on agriculture.
- Improve mechanisms to mitigate the adverse impacts of agriculture on the environment.
- Improve mechanisms to ensure the sustainable use of agricultural lands and water resources.
- Develop environmentally sound agricultural production.

The Republic of Azerbaijan has joined **the Bonn challenge to restore the forest landscape on lands degraded by climate change**, and aims to restore 270 000 ha of forest by 2030. Reforestation measures are being implemented on a total of 24 500 ha (22 000 ha through natural restoration and 2 500 ha through planting, sowing and other methods).

The new **National Forestry Programme and its Action Plan for 2020 to 2030** were finalized and submitted to MENR in 2019. The National Forestry Programme was drafted within the framework of a project to revise the national forestry programme and modernize the forest management system, supported by FAO and UNECE. The National Forestry Programme provides a sound legal basis for forest management and ensures the development of institutional capacities.

The Ministry of Ecology and Natural Resources and the Ministry of Agriculture Azerbaijan developed and adopted a **Joint Action Plan to Support Green Agriculture (2020–2023)** with a view to further strengthening the coordinated activities of the two government institutions in the fields of agrobiodiversity, ecosystem protection and efficient use of natural resources, with a view to improving information exchange.

The Joint Action Plan incorporates measures for the mitigation of and adaptation to the environmental impacts of agricultural activities, efficient water and land use activities, protection of biodiversity and ecosystems, aquaculture development, support for the development of organic (environmentally sound) agriculture, strengthening of institutional capacity, and the protection, expansion and efficient use of forest resources. Within the framework of the Joint Action Plan, a Working Group will be set up to implement measures on sub-activities in the coming years.

An Action Plan on Improvement of the Ecological Situation and Efficient Use of Natural Resources for 2015–2020 has been developed and highlights the importance of developing a National Adaptation Plan (NAP) and Nationally Appropriate Mitigation Action (NAMA) that incorporates elements relating to measurement, reporting and verification (MRV) systems.

The National Water Strategy of Azerbaijan for the period 2019–2037 has been drafted and work is underway to develop an Action Plan based on the completion of specific milestones: short-term activity until 2025, medium-term activity until 2030 and long-term activity.

The Water Strategy focuses on key challenges such as improvements to legislation, institutional structure and capacity, and the development of cooperation on transboundary waters in accordance with the principles of integrated water resources management. The goal of the Strategy is to develop a system of water resources management, protection, water supply and wastewater management in Azerbaijan that adheres to international standards.

The National Water Strategy is an important document in the context of implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki Convention), and adoption of the Protocol on Water and Health. Equally, the Strategy will play a significant role in the successful implementation of water policy in Azerbaijan. The draft Strategy has been aligned with SDG 6, SDG 12, SDG 13, SDG 14 and SDG 17.

At present, the main goal for the coming years is the restoration and reconstruction of the liberated territories, and their integration into value chains. The development of these areas, which have been declared Green Energy Zones, is based on the “smart city” and “smart village” concepts. At the same time, agricultural development policy in these areas will be based on the use of climate-friendly smart technologies.

The liberation of the occupied territories of Azerbaijan in 2020 will lead to an increase in agricultural land – 680 000 ha of the liberated territories are suitable for agriculture, of which 380 000 ha are hayfields and pastures, and 300 000 ha are arable land. This demonstrates that there is great potential for increasing the sown area in Azerbaijan over the coming years.

The **Azerbaijan National Strategy on Food Loss and Waste Prevention, Reduction and Monitoring** has been prepared in 2022 within the framework of the FAO project “**Reduction of Food Loss and Waste in Central Asia, Azerbaijan and Turkey**” (GCP/SEC/015/TUR) and implemented as part of the FAO-Türkiye Partnership Programme on Food and Agriculture (FTPP II) funded by the Ministry of Agriculture and Forestry of the Republic of Türkiye. The overall objective of the National Strategy is to reduce food waste by 50 percent by 2030 and reduce food losses along supply chains in compliance with the SDGs.

On 17 May 2022, a national workshop was organized in collaboration with the Ministry of Agriculture of Azerbaijan as part of the FAO project “Reduction of Food Loss and Waste in Central Asia, Azerbaijan and Turkey”, with a view to discussing and validating a draft national strategy on Food Loss and Waste Prevention, Reduction and Monitoring in Azerbaijan with the participation of key national stakeholders, project team members, private sector actors and representatives of civil society.

Azerbaijan 2030: National Priorities for Socio-Economic Development is a national development strategy outlining five national priorities including clean environment and green growth, adopted in 2021. The objective of the strategic document is to strengthen diversification and competitiveness of the Azerbaijani economy, eliminate oil dependence, expand non-oil sector and quality export production, promote the transition to a green economy, and further improve employment levels and the well-being of the population.

Chapter 7. Conclusions

Ensuring food security in the Republic of Azerbaijan is a key element of state policy, which recognizes that food security is supported by social and political stability. As of 2021, Azerbaijan ranked 33rd out of 116 countries on the global hunger index, giving the country a score of 7.5, indicating a low level of hunger (GHI, 2021). This represents a significant improvement on 2000, when the country had a much higher score of 25.0, indicating serious levels of hunger. In the intervening years, Azerbaijan has established partnerships with FAO and the United Nations to develop programmes addressing the country's hunger issues.

A successful transition to sustainable food systems will allow Azerbaijan to meet its targets for SDG 2 related to hunger, food security and all forms of malnutrition. Over the period 2011–2020, real growth in agricultural production amounted to 42 percent, while production of agricultural crops increased by 47.1 percent, livestock production by 38.7 percent and food production by 31.1 percent (www.stat.gov.az). Furthermore, high growth rates in the global organic market and increasing concerns for food safety and environmental issues in Azerbaijan make organic agriculture a promising sector.

The main goal of the development of the agrarian sector in Azerbaijan is to progress from ensuring food security to achieving competitiveness in export-oriented products.

The State Food Safety Programme for 2019–2025 was approved by the Head of State in 2019. Key steps are currently being taken to ensure the production of high-quality food products and their proper supply to the country's population. One of the main objectives is the provision of healthy and safe products, which will stimulate the production of organic products. Since the agricultural sector is a primary user of chemicals and mineral fertilizers, the production of quality products is considered a priority.

As mentioned above, the State Programme on Socio-Economic Development of the Regions for 2019 to 2023 has been approved, the main goal of which is to ensure sustainable and balanced development of the regions. This includes the creation of a favourable environment, the promotion of sustainable agriculture and the formation of a food safety system which will ensure a competitive economy based on the principles of the SDGs. The programme will also ensure that social welfare is maintained at a high standard, that natural resources are used efficiently and that the environment is fully protected.

Moreover, the government has developed a Sector Strategic Plan on Agriculture to ensure food security through the efficient use of existing natural and economic resources in the Republic of Azerbaijan, to meet the requirements of the industrial sector for raw materials and food products through local production, to increase agricultural exports and to boost employment in the regions. One of the key areas of the Strategic Plan is “environmental protection, sustainable use of natural resources and climate change impact management on agriculture.” Accordingly, the following measures will be implemented:

- Create mechanisms to mitigate the adverse impacts of climate change and other natural phenomena on agriculture.
- Improve mechanisms to mitigate the adverse impacts of agriculture on the environment.
- Improve mechanisms to ensure the sustainable use of agricultural lands and water resources.
- Develop environmentally sound agricultural production.

The main challenge for domestic agricultural supply chain is compliance with quality, food safety and environmental standards of modern food retail channels, and with international standards.

Currently, the country's level of self-sufficiency is 100 percent for fruit and vegetables, melons and eggs; 83.5 percent for meat and dairy products; and about 90 percent for potatoes. However, self-sufficiency rates are lower (less than 70 percent) for cereals (wheat). The country is a net importer of agricultural products, with its main export products falling within the fruit (apples, hazelnuts, cherries, persimmons,

pomegranates, etc.) and vegetable (tomatoes, onions, cucumbers) categories. For its major export products, Azerbaijan is highly dependent on the Russian market. Future prospects for increasing exports to the Russian market depend on that country's general economic situation in the coming years (which again depends significantly on international oil price developments) and its food security policy which tends to protect domestic production against foreign competitors.

Azerbaijan's food safety system (food production, processing, storage transport and trading standards) must be harmonized with the requirements of WTO, the EU and other international organizations, in order to increase the safety and quality of its products. There is need to develop an action plan and harmonize food regulations and standards with the requirements of the Codex Alimentarius, the International Plant Protection Convention (for plant products) and the International Epizootic Bureau (for animal products).

The Government of Azerbaijan recognizes the importance of agriculture and agribusiness for achieving economic growth and social stability in rural areas, ensuring food security and driving diversification beyond oil and gas. The agricultural and food production sector in Azerbaijan is strongly supported by the state including through subsidies for agricultural production and the purchase of agricultural machinery and equipment, as well as various incentives for the processing and sale of agricultural and food products.

Domestic food consumption patterns are slowly changing, influenced by increasing incomes, rising urbanization and changing diets, which lead to greater variety and an increase in convenience products. In addition, consumption of protein-rich food products like meat, fish and eggs has increased alongside fruit and vegetables, while wheat (bread) consumption has declined. Azerbaijan, like many countries in the Europe and Central Asia region, is characterized by high availability of milk and red meat but lower availability of fish and poultry. Availability of fish is extremely low compared to the world and EU average.

Azerbaijan struggles to promote organic farming, as demand for organic products is growing every year on both domestic and international markets. As part of the country's roadmap for 2017–2020, promotion of organic agriculture was emphasized as a priority. Natural soil and climatic conditions favour advances in organic farming, while the existence of scientific and educational institutions in the agrarian sector and experienced farmers in the regions may provide a suitable context for promoting organic agriculture in the country.

Despite the country's significant agricultural potential, productivity and profitability vary widely across the regions. Although the country's agricultural sector contributes around 7 percent to GDP, lack of modernization means that productivity remains low, due mainly to low levels of rainfall, scarcity of water and arable land resources, fragmented landholdings and serious degradation of natural resources in terms of soil erosion, salinity, loss of soil fertility and organic matter. There is therefore an urgent need to development organic agriculture in the country by harmonizing national legislation with international organic production standards and procedures (FAO, 2019a).

Azerbaijan seeks to promote the application of waste-free production technologies in the agricultural sector. Policymakers must therefore review the country's legal and regulatory framework to ensure that technological solutions able to prevent food loss and waste (FLW) can be implemented during production.

Domestic policy to reduce the negative impact of plastic packaging waste on the environment, due to be implemented after 2025, is indicative of the country's goal to expand the application of new technologies in the food supply chain and to establish new agrifood supply chain structures to reduce FLW in the food supply chain and expand recycling opportunities (MENR, 2019a).

In compliance with the Strategic Vision and Roadmap for Agriculture of Azerbaijan (2016–2020), the Ministry of Agriculture has conducted surveys and performed analyses to prevent and reduce losses among small and medium-sized producers and processors, and to assess needs for small agricultural

machinery and equipment to increase performance efficiency. The Ministry should also work to improve the supply of fertilizers and phytosanitary products to reduce crop losses.

In terms of climate change, Azerbaijan is especially vulnerable to droughts and flooding. High summer temperatures, water scarcity, land erosion and degradation, and salinity represent significant biophysical limitations to production, whereas the low level of skilled labour/educated farmers and expensive credit hinder the implementation of modern technologies and management principles. The negative effects of climate change are already visible in Azerbaijan, with particularly severe implications for the water sector. Over recent years, drought and declining water resources have been observed, while many areas below sea level are flooding. All these factors reduce agricultural productivity in the country (UN, 2021).

The projected reduction in water resources of the Kura River and changing precipitation patterns will lead to even more prolonged droughts and extreme weather events in Azerbaijan in the foreseeable future. Over recent years, there has been growing concern about the continued decline in water level in downstream parts of the Kura River, while seawater intrusion into the Kura River delta linked to anthropogenic and climatic factors is diminishing and threatening supplies of freshwater for riparian communities in the Neftchala and Salyan regions. It is forecast that water scarcity will increase 23–25 percent by 2050 due to the projected decrease in water resources (UN, 2021).

In light of the above, climate change adaptation of the agriculture sector is a priority policy area for Azerbaijan, and aims at reducing vulnerability and ensuring the resilience of the country's agrifood systems to climate change impacts.

Chapter 8. Towards sustainable food systems – potential next steps

The future plans of the Government of Azerbaijan with regard to national food systems for the next decade focus on a number of priority directions in accordance with National Pathway to Sustainable Food Systems by 2030:

- achieving a future in which healthy and organic food is available, affordable and accessible to a growing population;
- ensuring the provision of livelihoods of people in agriculture and along the food chain;
- contributing to the sustainability of the environment.

Over recent years, large-scale and targeted measures have had a positive impact on improving food supply in Azerbaijan. However, it is necessary to further increase food safety and transform the national food system. The following recommendations support agricultural development and the transformation of national food systems in Azerbaijan.

Ensuring full digitalization of agrifood systems and promoting advanced technologies

Expanding the functionality of the e-agriculture system (EKTIS) will provide farmers with all the necessary services they need with a greater level of efficiency. It is widely recognized that the use of biotech plants allows the production of more food with less resources, such as land, while reducing the risk of product loss due to diseases and pests. Thus, improving food production with the support of the agricultural biotechnology sector can be an important step towards implementing a sustainable food system.

Strengthening food safety and promoting healthy diets

Strengthening the capacity of national food safety legislation, institutional mechanisms and laboratories, and improving food safety management at various levels will improve food safety in Azerbaijan. Another challenge in terms of achieving sustainable food safety and improving public health is to shift the country's current food consumption patterns. Promoting safe and healthy dietary habits, while improving education in the field of food systems, facilitating access to information for consumers and producers, and organizing targeted awareness-raising campaigns will improve people's health by preventing chronic diseases related to various diets, and contribute to ensuring the sustainability of the National Food System.

Strengthening the fight against climate change and disasters through sustainable use of natural resources

Agrifood systems account for around 24 percent of global GHG emissions, the main contributor to climate change. However, climate change has multifaceted interactions with food systems, affecting food availability, access and use and resulting in food insecurity. Supporting food producers in the use of climate-smart agriculture practices and clean technologies while maintaining or increasing productivity levels will support a transition towards a sustainable and resilient food system. Particular attention must also be paid to increasing responsible use of fertilizers and pesticides, and reducing soil degradation through targeted agricultural policies – an approach that will also preserve biodiversity, especially in rural areas.

In Azerbaijan, the challenge is intensified by agriculture's extreme vulnerability to climate change. The negative impacts are already being felt in the form of increasing temperatures, decreasing precipitation, weather variability, shifting agroecosystem boundaries, invasive crops and pests, and more frequent extreme weather events. In this context, supporting farmers' access to innovative irrigation systems and technologies will not only contribute to the availability of food, but also help ensure the efficient and sustainable use of water resources.

Fostering small and medium-sized food processing businesses and supporting cooperation activities among small-scale farmers

It is widely recognized that small-scale farmers and small and medium-sized food enterprises are at the core of Azerbaijan's food system. It is necessary, therefore, to support cooperation activities among small-scale farmers. In order to encourage and increase the capacity of small-scale farmers to shift towards a sustainable food system, new financial solutions must be developed, access to financial resources must be facilitated, existing administrative barriers to long-term investments must be removed, well-functioning risk-sharing mechanisms and insurance schemes must be established, access to inputs must be improved, and a common infrastructure and internal logistical network for specialized agricultural chains must be created.

Improving the quality of education and research, and strengthening collaboration between science and policymaking

Modernizing the vocational education system and facilitating the access of farmers and food producers to quality education and training opportunities will contribute to the creation of a sustainable food system in Azerbaijan. In addition, improving the quality of agricultural and food research will facilitate better understanding of the challenges and opportunities associated with transforming the food system and identifying critical areas for action. Strengthening evidence-based policymaking using basic research should improve the effectiveness of policy decisions by providing policymakers with the most relevant information. In this context, knowledge, innovation and technology transfers along agrifood value chains are crucial to achieving a sustainable and inclusive food system.

Developing the food system in the liberated territories and ensuring their integration into the national food system

Development of sustainable food systems in the liberated territories of the Garabagh region and their integration into the national food system, while adopting various support measures along the food value chain, will contribute to the development of the national food system. The occupation of part of Azerbaijani lands by Armenia for 30 years has had a negative impact on the forests, biodiversity and water resources of the country. Azerbaijan aims to carry out reforestation measures in the newly liberated areas to prevent climate change and soil degradation. In the meantime, the liberated territories will be reconstructed based on the **"Smart Village"** and **"Smart City"** concepts. Such "smart" farms will enable the production and processing of fruits, vegetables, meat and dairy products in rural areas to better meet modern requirements. The first **"Smart Village"** project is already being implemented in the Aghali village of Zangilan district. By facilitating the use of digital technologies and implementing the "smart village" initiative, Azerbaijan is contributing to **FAO's "1 000 Digital Village Initiative"** to advance sustainable development in rural areas and improve the livelihoods, agriculture, food security, nutrition, health and well-being of the rural population.

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Annexes

Annex 1. General country and agriculture sector context

Azerbaijan is the largest of the South Caucasus countries with a land area of 86 600 km² consisting of 12 percent of forests, 1.7 percent of water and 55.1 percent of agricultural lands, 30.5 percent of which are pastures and 31.2 are other types of land). The territory of Azerbaijan extends 400 km from north to south and 500 km from west to east. The Republic of Azerbaijan shares borders with five countries: the Russian Federation to the north (a border of 390 km), Georgia to the north-west (480 km), Armenia to the west (1 007 km), Turkey to the south-west (15 km) and Iran to the south (765 km). The length total of all borders is about 2 647 km. The eastern part of the country opens onto the Caspian Sea (an area of 825 km).

Development of the agricultural sector is central to the diversification of the economy. As the third largest sector in Azerbaijan's economy, following oil and construction, agriculture accounts for the highest share of employment (approximately 37 percent), and has a huge influence in terms of reducing rural poverty. Viticulture, silkworm breeding and fruit growing are widespread, while cattle breeding plays an important role in people's lives, especially in areas covered by mountainous relief, which cover much of the country.

In rural areas, 57 percent of people are self-employed (World Bank, 2019), and in 2018 more women (55.8 percent) than men (44.2 percent) were employed in agriculture, forestry and fishing (SSC, 2019). The share of the agriculture sector in Azerbaijan's GDP has increased from 5.5 percent in 2010 to 6.9 percent in 2020 (SSC, 2021).

The government promotes a policy of agriculture-led industrialization, which is particularly focused on good governance, proximity to farmers, innovation and digital technologies (promoting e-agriculture and smart villages), value chain development and promotion of exports (UN, 2021). Since food security and sustainable agriculture are key goals, the bulk of investment is directed at the transformation of digital and smart agriculture. The main state support mechanisms are aimed at stimulating innovation partners for the application of modern agricultural and horticultural technologies. In addition to encouraging farmers to use digital technologies, the government has provided them with access to financial resources and training services (MoA, 2022).

Azerbaijan is a country with limited land resources. The total land area is more than 8.641 million ha. Some 4.78 million ha (55 percent) are agricultural lands, including 1.45 million hectares of irrigated land. About 2.06 million ha of agricultural land are utilized arable lands. Specifically, per capita land area usable for agriculture is 0.46 ha, while the per capita area of pastures and hayfields is lower (SSC, 2020). Permanent crops occupy an area of 260 300 ha, while hay fields and pasture areas account for 2.42 million ha (50.7 percent of the utilized agricultural area). Crop production accounts for 47.9 percent of agriculture while the proportion of livestock farming is slightly larger at 52.1 percent (SSC, 2021). Forest-covered areas amounted to 1.04 million ha in 2019 (SSC, 2019).

During 2011–2020 real growth of agricultural production in the country amounted to 42 percent. Production of agricultural crops increased by 47.1 percent, livestock production by 38.7 percent and food production by 31.1 percent. Over the past ten years, exports of agricultural and food products increased by about 23.4 percent, due mainly to an increase in exports of primary agricultural products. During this period, the volume of imports of agricultural and food products increased by 37 percent.⁵

A substantial number of Azerbaijan households living in rural areas are engaged in subsistence agriculture accounting for 32.8 percent of private agricultural holdings. It is estimated that almost 90 percent of farms

⁵ State Statistical Committee of the Republic of Azerbaijan. Azerbaijan Foreign Trade Relations, 2011–2020.

(620 000) are smallholdings which occupy 85 percent of farming lands. These groups are highly vulnerable to shocks. Reduction in land productivity or lower than seasonal rainfall has a direct implication on income generated and food available for consumption, which is also reflected in other socio-economic indicators. In some regions, the issue of small landholdings is further exacerbated by low productivity linked to land degradation and salinization. In particular, Siyazan-Sumgait, Jeyranchol, Nakhchivan and the lowland region of Kura-Araz are exposed to significant levels of salinity, with the latter also characterized by a high level of land degradation and soil erosion leading to decreased crop yields.

Without additional resource conservation measures, the country may face water shortages, increased desertification and land degradation, greater frequency of droughts and other climate-related dangerous phenomena, leading to instability in agricultural production and threats to food security.

Azerbaijan's farming sector is highly dependent on irrigation with irrigated lands accounting for more than 90 percent of agricultural production. The total area of irrigated land exceeds 1.45 million ha, representing about 30 percent of the country's total utilized agricultural area. Irrigation accounts for 70 percent of water diverted from rivers, although significant opportunities exist to enhance productivity and efficiency of water use (SSC, 2020). Much of the territory of Azerbaijan is characterized by a rather dry climate. This is the case for the Kura-Araz region which occupies nearly 40 percent of the country's area, Absheron, Nakhichevan, Shaki-Zaqatala and Ganja-Qazakh. All these regions produce important agricultural products, such as wheat, grape, cotton, fruit and vegetables.

Water supply poses a challenge in Azerbaijan, due to the uneven distribution of water resources both seasonally and spatially (MENR, 2015). Mountainous regions in particular endure frequent and intense flooding and mudflows during wet months, and water shortages during dry months (ADB, 2017). Azerbaijan is forecast to be one of the 13 countries in 2025 with the least water resources per person (about 972 cubic metres/year) according to World Water Resources Institute estimates.

Although uncertainty exists regarding projected levels of precipitation in future decades, increased temperatures are likely to lead to greater evaporation of water resources and reduced river flows, putting pressure on one of Azerbaijan's main sources of freshwater. In addition, the country's accumulated water resources per capita are relatively low with 70–75 percent of this water supply coming from sources originating outside Azerbaijan's borders.

Water shortages have become an increasingly common issue for farmers. Droughts of longer durations are linked to rising temperatures and reduced rainfall in all the above regions. Over the period 2016–2021, the impact of droughts reduced agricultural production across the country. Irrigated crops account for 85 percent of total agricultural output, and are also at risk from projected water shortages, with higher temperatures requiring increased irrigation to maintain yields.

Climate change is expected to increase the frequency and intensity of extreme weather events, which will negatively affect agricultural production systems, affecting in particular the most vulnerable, such as the smallholder farmers, who are dependent on the sector for their food, income and livelihoods.

Index allocations to agriculture regarding the structure of state expenditures for the period 2019–2020 were less than 1 and varied between 0.49 and 0.60. This implies that the contribution of agriculture to the economy is higher than the share of allocations to agriculture in state expenditures.

The volume of value added in agriculture, forestry, fisheries and hunting increased from AZN 3.4 billion in 2015 to AZN 5 billion in 2020. In 2019, the value added created by agriculture, forestry, fisheries and hunting increased by 7.3 percent compared to the preceding year.

In 2020, although unfavourable climatic conditions led to a slowdown in growth, the total value added created by agriculture increased by 1.9 percent compared to 2019. Overall, the value added created in the agricultural sector increased by 19.2 percent during 2016–2020.

Annex 2. Sustainable food systems and FAO BESEC project considerations

Food systems approaches continue to grow in popularity and importance as policymakers and governments recognize their critical importance for achieving the Sustainable Development Goals (SDGs) by 2030. This trend is apparent in events such as the UN Food System Summit, COP 26 (with an increased focus on food and agriculture) and the Nutrition for Growth summit.

A range of pressures including rapid population growth, urbanization, growing wealth and consequent change in consumption patterns, are challenging the ability of food systems to provide nutritious food, and to contribute to enhanced livelihood opportunities in an environmentally sustainable way (FAO, 2021).

In 2019, a joint report, **“Food Systems at Risk”**, published by the EU, FAO and the French Agricultural Research Centre for International Development (CIRAD), highlighted the urgent need to transform food systems to be more sustainable, resilient and inclusive.

The present report aims to provide inputs into food system thinking in Azerbaijan.

FAO defines food systems as follows:

The agri-food system covers the journey of food from farm to table – including when it is grown, fished, harvested, processed, packaged, transported, distributed, traded, bought, prepared, eaten and disposed of. It also encompasses non-food products that also constitute livelihoods and all of the people as well as the activities, investments and choices that play a part in getting us these food and agricultural products. In the FAO Constitution, the term “agriculture” and its derivatives include fisheries, marine products, forestry and primary forestry products (FAO, 2021).

Multiple other definitions exist (see Barrett *et al.*, 2020), most of which highlight the need to balance economic, social and environmental sustainability demands in a food system that provides income, returns on assets, tax revenue for the government, nutritious and safe food to consumers, and positive socio-economic and environmental benefits (FAO, 2018a). The holistic nature of food system analysis sets it apart from other approaches. It focuses on dynamic relationships between drivers, the structural nature of the system itself and the outcomes that these interactions deliver or fail to deliver. This approach accepts that food systems change and evolve. While certain stages or trajectories of food system development can be identified, no singular food system exists either globally or domestically. Rather, multiple food systems co-exist and interact in diverse ways. Food systems approaches recognize the existence of trade-offs between goals and seek to inform policymakers of their options and the potential implications of policy decisions. This is not, however, a normative approach with a “correct” answer. Instead, food systems represent an analytical framework to visualize and inform decisions that balance demands with local needs in order to develop tailored solutions.

The Black Sea region is a strategically important geographical location connecting Europe and Asia and home to a rich bio-diverse ecosystem including unique marine habitats. All food systems rely upon natural resources, which are currently under threat due to changing climate conditions and human behaviour. In addition, intensive and uncontrolled agricultural practices put extensive pressure on nature and may lead to deforestation, biodiversity loss, land degradation and conversion of natural habitats. In the light of these threats, enabling sound sustainable food systems has been identified as a priority for Black Sea Economic Cooperation (BSEC) countries. Tackling these issues necessitates countries acting together to

establish a platform (mechanism) integrating instruments for the sustainable management of natural resources and reduction of food losses and waste in value chains. BSEC aims to take concrete steps and achieve tangible results in the areas of sustainable agriculture and agro-industry, which in turn should open up the agricultural potential of the region.

BSEC has identified current weaknesses relevant to sustainable food systems in the region. Maintaining sustainable food systems requires extensive research to develop united approaches to common challenges, and experience and evidence sharing to learn from each other. During the BSEC Agriculture Ministers Meeting held in Turkey in May 2017, and subsequent meetings of the BSEC Working Group on Agriculture and Agro-Industry, the BSEC member states agreed to establish the “BSEC – Regional Cooperation Centre for Sustainable Food Systems”, in partnership with FAO and the Republic of Turkey.

This initiative may assist the BSEC member states in implementing joint research programmes, special training activities, exchange of information and knowledge within the BSEC region, on sustainable food systems. By the end of the project, the BSEC member states should have strengthened their capacity to analyse and monitor food systems for sustainability and implement projects to make food systems more sustainable.

The BSEC Regional Cooperation Centre for Sustainable Food Systems (BSEC-CSFS) will directly contribute to SDG 12 (responsible consumption and production) and SDG 2 (zero hunger), and indirectly to all the other Goals. The BSEC member states will benefit from the work of the BSEC-CSFS, as they will receive advice, guidance and information on making food systems in BSEC states more sustainable. This will be achieved through capacity development of government officials and other stakeholders in sustainable agricultural production, enhanced agricultural trade and enhanced regional cooperation/competitiveness of member states in food and agriculture products. The main outcome of the project will be stronger regional cooperation in the areas of food security and safety, improved institutional capacities, poverty alleviation, and sustainable natural resource management including aquatic resources. The BSEC-CSFS will prepare the BSEC Regional Sustainable Food Systems Programmes and Action Plans and support the activities and projects for their implementation. The Centre will conduct co-programmes on sustainable food systems and cooperate closely with other international organizations if deemed appropriate.

Among the different outputs and results needed to reach the above-mentioned project impacts and outcomes, the BSEC-CSFS is preparing the **Review Report on the Current State of Sustainable Food Systems in the BSEC Region**. A team of experts and national and international consultants have been recruited to collect and analyse primary and secondary data on food systems in their countries with a view to assessing the sustainability of their national food systems. Food Systems Assessments Profiles have been prepared for each of the 13 member states, which in turn will be used to prepare a regional report on the state of food systems in the BSEC region, including gender gaps.

The process has been enriched by the participation of National Focal Points and Alternates in each BSEC member state, as well as the involvement of universities and institutions that have reviewed the reports on the state of food systems in the BSEC countries.

[Annex 3. Methodology for rapid assessment of food systems](#)

The development of this country report for Azerbaijan involved the following steps:

- Existing data on the components of the national food system were compiled and assessed using international datasets (FAOSTAT, FAO AQUASTAT, Food Systems Dashboard, Global Food Security Index, IPPCC, World Bank, UNEP, UNDP, UNDESA) as well as relevant national datasets (AZPROMO, State Statistical Committee of the Republic of Azerbaijan, Ministry of Agriculture). This exercise focused on the last decade but also included historical data, where relevant.

- Based on the available data, a heat map of existing knowledge about the national food system was constructed. The process started with international data, which was classified based on quality and consistency into three categories: good, partial and missing. Higher quality data helped to identify key trends and provide an initial narrative of the evolution of the national food system.
- To complement existing available international data and to better assess the emerging narrative, local food system actors were engaged in the process. Targeted semi-structured interviews were conducted with representatives of the five following agencies from across the food system: the Azerbaijan Agency for Agro-Credit, the Azerbaijan Food Safety Agency, the Ministry of Agriculture, the Ministry of Ecology and Natural Resources, and the State Statistical Committee of the Republic of Azerbaijan. In some cases, this process led to the incorporation of additional national datasets, while in others it helped understand the trends and dynamics at play in the national food system and further sharpen the narrative.
- Finally, the information gathered through data and interviews was combined in the present document in order to provide a snapshot of the key drivers, status and outcomes of the national food system. This exercise constitutes a first step towards a more holistic understanding of the Azerbaijan food system. Nonetheless, additional data collection, analysis and ongoing engagement with key food system actors is recommended in order to deepen understanding, identify additional priority action areas, and move towards coherent and integrated policies to improve the social, economic and environmental performance of the food system.

Table A1. Data availability for assessment indicators across food systems

1. Drivers	Four individual factors
Biophysical, climate change and environment	Economic
Globalization and trade	Situational
Politics and leadership	Aspirational
Income growth and distribution	Cognitive
Socio-cultural context	
Population growth and migration	
Urbanization	
2. Food supply chain	5. Consumer behaviour
Production systems and input supply	Acquisition
Storage and distributions	Preparation
Processing and packaging	Meal practices
Retail and marketing	Storage
3. Food environments	6. Diets
Food availability	Infant and young child feeding practices
Food affordability	Dietary intake
Food safety and product properties	Food security
Vendor properties	Nutritional status
Food messaging	Non-communicable diseases

Annex 4. Stakeholder mapping and main actors

Supporting institutions in the agriculture sector

The institutional situation in Azerbaijan is characterized by independently operating ministries and organizations that form a group of water, soil, land and climate related stakeholders that coordinate on a limited, mostly only as-needed basis, while international financial institutions and private banks managing lending loans for the agriculture sector. The aforementioned ministries include the Ministry of Agriculture, the Ministry of Ecology and Natural Resources, the Ministry of Emergency Situations with its State Agency for Water Resources, the Ministry of Health, the Azerbaijan Amelioration and Water Management OJSC, Water Users Associations (WUAs), private landowners and the Azerbaijan Farmers Association. The Cabinet of Ministers of the Republic of Azerbaijan is responsible for coordinating all activities towards the achievement of national aims and the full implementation of legal requirements.

The Ministry of Ecology and Natural Resources (MENR) is the key state institution responsible for formulating and implementing environmental policy, developing environmental protection measures, screening activities under development for potential adverse impact, implementing climate-related activities, monitoring the implementation of environmental legislation and imposing sanctions, administering a pollution permit system, and monitoring the quality of air, soil, precipitation, surface and groundwater, as well as biodiversity, forests and radioactivity. MENR also acts as the national authority responsible for implementing the provisions of the UNFCCC.

MENR executes state water policies aimed at the conservation and sustainable use of water resources both surface and groundwater, the prevention of pollution, and the management of flooding, mudflows, submergence, landslides and natural disasters, including droughts. In addition, relevant services of MENR carry out water resources inventories, and manage the monitoring stations network for hydrometric, hydro-geological and hydro-chemical observations. The Ministry prepares the water budget, evaluates groundwater resources and yields, and deals with issues relating to the rational use and regeneration of water resources. It establishes and approves standards for Maximum Allowable Discharges (MAD) of wastewater and controls them through regional offices. MENR includes several water-related services.

The Ministry of Emergency Situations (MES) is the lead organization for all aspects related to managing emergency situations in Azerbaijan. It coordinates activities for the protection of the population from natural and man-made disasters including fire, eliminating the consequences of disasters and implementing state policy in the field of civil defence, rescue and restoration works. The Ministry of Emergency Situations, in line with its statutes, also has necessary authority relating to the management of flood, mudflow, submergence, landslide and other similar natural disasters in the country, a responsibility it shares jointly with MENR.

The State Agency for Water Resources (SAWR) under MES in compliance with its statute ensures the reliable protection of water reservoirs of national importance, oversees technical maintenance of water reservoirs in the country, undertakes measures to improve water resources management and conducts monitoring of water bodies, hydrotechnical structures and water supply systems.

SAWR participates in the protection of water bodies, hydraulic facilities and water supply systems in emergency situations and takes part in mitigating the impacts of emergency situations jointly with other structural units of MES and relevant public institutions. SAWR prepares and implements flood management and drought emergency plans jointly with other mentioned national level organizations, their regional offices and local government in the regions.

Ministry of Agriculture

The Ministry of Agriculture of the Republic of Azerbaijan (MoA) is the central executive body that implements state policy in the agrarian sector relating to the production and processing of agricultural products, the provision of essential services to producers, veterinary services, plant protection and quarantine measures, and the efficient use of land.

Policy implementation has increased significantly in recent years, due to investment by the MoA in building the capacity of support institutions for agriculture at the national and regional level.

The Ministry is responsible for overseeing and coordinating the activities of a wide range of agencies and entities including: the Agro Services Agency, the Agro Credit and Development Agency (AKIA), the Agro Research Centre, the Agrarian Science and Innovation Centre, the State Seed Fund, the Republican Artificial Insemination Centre, the Agrarian Procurement and Supply OJSC, the “Azeragrar” State Production and Processing Union LLC, the State Agro Trade Company LLC, the Green Park Azerbaijan LLC and Regional Agricultural Development Centres.

The Agency for Agricultural Services under the Ministry of Agriculture

The Agency for Agricultural Services under the Ministry of Agriculture was established by Decree of the President of the Republic of Azerbaijan No. 467, dated 14 January 2019, “On additional measures to improve management in the agricultural sector”, to optimize and increase the efficiency of public services in the agricultural sector. “Regulations on the Agency for Agricultural Services under the Ministry of Agriculture of the Republic of Azerbaijan” were approved by Decree of the President of the Republic of Azerbaijan No. 701, dated 21 May 2019.

The Agency for Agricultural Services exercises state control over the fields of animal and plant health, breeding achievements, production of seeds, as well as vehicles and other agricultural machinery. The Agency’s main objectives are to ensure animal and plant health, increase livestock productivity, provide phyto-sanitary services, including agrochemical services, registration and protection of selection (breeding) achievements, crop seed management and government control over seed production. The Agency renders a total of 53 services related to veterinary medicine, phytosanitary measures, registration of selection achievements, seed production and technical controls.

The Azerbaijan Agency for Agro-Credit and Development (AKIA)

The Agrarian Credit and Development Agency under the Ministry of Agriculture was established in accordance with the Order of the President of the Republic of Azerbaijan No. 467, dated 23 October 2004, “On Measures to Improve Management in the Agrarian Division”. This executive body ensures the involvement and use of loans for state support of individuals and legal entities engaged in entrepreneurial activity in the agrarian sector.

The Agency is governed by its own regulations and legal acts of the MoA, and engages mainly in activities related to the issuance of soft agricultural loans, discounts for equipment and breeding animals, preferential loans, provision of security, delivery of subsidies, project management and the involvement of investment in agriculture.

The Food Safety Agency of the Republic of Azerbaijan (AFSA)

The Food Safety Agency is the central executive authority established by Decree of the President of the Republic of Azerbaijan No. 1681, dated 13 November 2017, implementing state policy and regulation in the area of food product safety, exercising regulatory veterinarian and phyto-sanitary controls, conducting registration of entities operating in the entire food chain, issuing health, veterinarian and phyto-sanitary certificates, exercising state control over the protection of the rights of consumers of food products and cargoes under state veterinarian and phyto-sanitary control at all stages of the food chain, including primary production, procurement, processing, packaging, storage, transportation and circulation (including import-export operations). In this context, the Food Safety Policy of Azerbaijan is a national policy with a cross-sectoral approach.

The objectives of the State Food Safety Programme are as follows:

- I. Strengthening food safety and quality management in compliance with international food safety requirements.
- II. Improving the provision of safe and quality food to the population, thereby significantly reducing foodborne illnesses.
- III. Increasing competitiveness and export potential to foreign markets by improving food safety and quality.
- IV. Strengthening control measures for agrochemicals, plant protection products and veterinary drugs used in agriculture, as well as awareness-raising on their proper use.
- V. Strengthening the enforcement of legislation on food safety.
- VI. Developing public control mechanisms to ensure food safety and consumer protection on the basis of best practices.
- VII. Ensuring animal and plant health in accordance with international best practices.
- VIII. Supporting entities operating in the food business.

To this end, the government will strengthen the authorities of the Food Safety Agency in the fields of scientific and risk-based food inspection and monitoring, and improve food safety and quality management by 2025.

In this context, the expected outputs of the State Programme on Food Safety include: the harmonization of food safety norms with existing international requirements, increased accuracy of food safety and minimum quality indicators for laboratory analysis to 95 percent, reduction in the number of cases of food poisoning, increased export of food and agricultural products including to markets of developed countries, minimization of rejection of food and agricultural export consignments by importing countries, minimization of public health concerns due to zoonotic diseases and misuse/overuse of plant protection products, development of fundamental and applied research on food safety, increased application of advanced food safety management systems to 90 percent in large enterprises and 50 per cent in medium enterprises, and increased level of satisfaction of entrepreneurs operating in food and agriculture sectors with control and regulatory activities.

In order to meet veterinary-sanitary and sanitary-epidemiological requirements, the AFSA will support the establishment of private slaughter and sale centres.

The Government of the Republic of Azerbaijan has been working to improve international export standards. Azerbaijan is already a member of the International Organization of Standardization (ISO), and is making preparations for accession to the WTO and the Codex Alimentarius, which approximate EU rules. In this context, institutional and regulatory frameworks and policy measures aimed at improving the food system have been put in place, and a new Law on Food Safety and a State Programme on Food Safety covering the period 2018–2025 have been adopted.

Due to the adverse impacts of foodborne illnesses on public health and welfare and the economy, this Policy Food Safety Policy underlines the importance of food safety in the fields of development, ensuring the health of future generations, protecting the human gene pool, as well as ensuring economic efficiency. In compliance with **the farm-to-fork approach of FAO**, the Policy emphasizes the strengthening of food safety and quality control along the entire food chain.

The Ministry of Health is the competent authority responsible for implementing state control over drinking water quality and standards in line with the WHO requirements.

The Azerbaijan Amelioration and Water Management OJSC, in line with its Charter, implements functions related to supplying water consumers with water (primarily irrigation water), organizing the use of surface water bodies, operating and protecting state-owned amelioration and irrigation systems, distributing water taken from water bodies in the established order and organizing control over use thereof, providing relevant state bodies with proposals on use, protecting surface water bodies and

preventing harmful effects of water (mudflows), monitoring data on surface water bodies, developing and implementing measures on the prevention of harmful effect of waters and mitigating the results, and organizing operations related to riverbank and embankment protection facilities.

The **Ganja Agribusiness Association (GABA)** is the primary non-governmental organization (NGO) in Azerbaijan promoting organic agriculture. GABA provides significant online and direct services encompassing training and education, extension services, marketing, scientific research, ecological monitoring of soils, business plans, certification and accreditation. GABA participates actively in conferences, meetings, fairs and workshops in Azerbaijan and internationally.

The **Azerbaijan Farmers Association (AFS)** is a non-profit organization that supports the development of agriculture and family farms in Azerbaijan. The organization was established in 2018 on the personal initiative of a group of professionals working in the field of agriculture. Since its inception, AFA has worked to address challenges faced by farmers and households in the country, establishing a healthy dialogue between farmers and large entrepreneurs, the state and the media. The main areas of AFA's work encompass the protection of interests and rights of farmers and other segments of agriculture, the development of a mass farmer movement in the country and contributions to state support of landowners and farmers. The AFS functions as a union for all members, and membership is free for all participants in the agricultural sector on a voluntary basis.

AZPROMO

The President of the Republic of Azerbaijan signed the Decree on large-scale promotion of local non-oil products in foreign markets as "**Made in Azerbaijan**" on 5 October 2016. In accordance with the Decree, the **AZPROMO** agency was established to assist Azerbaijani companies in selling their products on foreign markets. The agency subsidizes producers to attend international trade shows, fairs and exhibitions, and operates trade promotion offices in China, the Russian Federation and the United Arab Emirates, where their representatives engage in business and partnerships to attract foreign direct investment and enhance tourism to Azerbaijan.

The Decree contains ten different support mechanisms to stimulate exports and promote the brand "**Made in Azerbaijan**" abroad. Depending on the support mechanism, the costs relating to realization are fully or partially covered by the state budget, and every company engaged in exporting local non-oil products has the right to apply. The promotion of "Made in Azerbaijan" by state-owned legal entities is carried out by representatives and branches of these entities in foreign countries. The list of entities is determined by the Ministry of Economy.

Agrarian Insurance Fund (AIF)

The Agricultural Insurance Law was adopted on 27 June 2019 based on the principles of public-private partnership. The Agricultural Insurance Fund is a non-profit legal entity established by the state to carry out insurance payments for risks. The management company is a joint insurer established by insurance companies licensed for life insurance and organizes the conclusion of insurance contracts. The agricultural insurance system is organized on the principles of voluntary insurance. Its objectives are to facilitate the formation and development of the agricultural insurance market infrastructure; to ensure the organization, development and sustainability of the agricultural insurance system; to ensure the protection of agricultural products from risks; and to secure the sustainability of agricultural production and to support farmers' access to finance.

According to the Azerbaijan Agricultural Research Centre, since late 2020, a new agricultural insurance mechanism operated by the Agrarian Insurance Fund (AIF) has been operational in Azerbaijan. According to the requirements of the Agricultural Insurance Law, the following will be subject to agricultural insurance under this mechanism:

- crops and vegetables, including perennials;
- livestock and animals raised for agricultural purposes;
- seafood products

The following crops were covered by insurance in 2020: wheat, barley, corn, potato, sugar beet, orange, lemon, tangerine, tea, tobacco, rice, grapes, hazel and cotton. The following livestock are also covered: milk cows and buffalo aged from one to seven years old. Natural hazards covered by agricultural insurance include the following:

- natural hazards (earthquakes, landslides, whirlwind, storm, hail, wildfires);
- plant diseases and pests (rust disease in cereals, mildew disease in grapes, rodents resembling mice, locusts, Mediterranean fruit fly, brown marmorated stink bug);
- infectious diseases and poisonings (death from infectious diseases, except for diseases included in the list of special dangerous infectious [exotic] diseases, death from a snake or an insect bite, death from poisonous herbs and forage, death as a result of mass poisoning);
- death by attack of wild animals (wolf, jackal, fox, bear, etc.) (CoM, 2019).

Under the Agricultural Insurance Law, the AIF pays subsidies covering 50 percent of the premium of crop insurance. However, farmers are still reluctant to purchase insurance (CoM, 2019) due to a lack of trust between farmers and insurance companies regarding their expertise in assessing agricultural damage and losses and limited farmer awareness of insurance benefits. In addition, farmers still view the premiums as too costly despite the subsidy.

[“FINCA Azerbaijan”: a limited liability non-banking credit organization](#)

FINCA Azerbaijan is part of FINCA Impact Finance’s global network of 18 banks and microfinance institutions, which reach more than 2.6 million clients through 18 subsidiaries in five continents. Since 1998, FINCA has helped thousands of Azerbaijani farmers to improve their lives. FINCA Azerbaijan is a leader in responsible finance, serving small businesses across the country with loan products to promote profitable business activity. The organization emphasizes empowering entrepreneurs in the agriculture sector.

[Support provided by the Asian Development Bank to promote financial services in Azerbaijan food systems](#)

The **Asian Development Bank (ADB)** provides support to promote rural financial inclusion and improve financial service outreach for Azerbaijan. The Government of Azerbaijan adopted an ambitious strategy to gradually reduce reliance on oil exports and boost development of other sectors and regions, in particular agribusiness and the rural economy. Similarly, ADB’s country partnership strategy for Azerbaijan, 2000–2012 included agriculture and rural development as well as rural finance and microfinance as key pillars. ADB supported this strategy through several loan and technical assistance projects, including a USD 4 million non-sovereign loan to promote microfinance lending by **AccessBank Azerbaijan (ABA)** in 2005. The USD 75 million loan approved for ABA was accompanied by a parallel loan of USD 25 million to Finca Azerbaijan, a microfinance institution serving similar markets to those served by ABA. The Board of Directors of ADB approved loans of USD 50 million in July 2013 and USD 75 million in April 2015 to promote lending to micro, small, and medium-sized enterprises (MSMEs) in Azerbaijan, with a particular focus on areas outside the capital city of Baku and the agriculture sector.

[AccessBank Azerbaijan \(ABA\)](#)

Several International Financial Institutions (IFIs) sharing similar development objectives and business approaches established ABA as a greenfield bank in 2002. ABA focused on lending to MSMEs and had a strong presence in regions outside Baku. It was managed by Access Microfinance Holding Aktiengesellschaft (AMH) and followed AMH's established business model of lending to MSMEs based on informal cash-flow projections and local knowledge instead of, or in addition to, formal loan documentation and collateral. From its inception, ABA grew rapidly to become the eighth largest bank in Azerbaijan by 2012, with assets of USD 656 million, a market share of 3.3 percent of total loans and a leading position in microfinance. ABA was financed predominantly by loans from IFIs and impact investors.

EU and EBRD support for agricultural lending in Azerbaijan

The EU is the largest grant donor to Azerbaijan and to the rural development and agriculture sector. EU actions currently focus on improving overall sector governance, notably through reform of the subsidy regime, strengthening of agricultural advisory services, introducing good agricultural practices, climate change resilience and a rural business information system, as well as aligning the food safety legal and institutional framework with EU standards.

The Azerbaijan Agriculture Loan Evaluation System (AzALES) was launched in September 2019 by the European Bank for Reconstruction and Development (EBRD) and the Frankfurt School of Finance and Management, with support from the EU. The system covers all commercially viable crops and animal products in Azerbaijan and helps lenders to assess risk more effectively, process loan applications faster and improve small private farms' access to finance. The EBRD is one of the leading institutional investors in Azerbaijan, focusing on supporting efforts to diversify the economy and develop the private sector.