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The Role of Agriculture in Somalia's Economic Growth: A
Comparative Analysis with Turkey

GRADUATION PROJECT

ECONOMIC

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i. Acknowledgment

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ii. Abbreviations

GDP: Gross Domestic Product

FAO: Food and Agriculture Organization (of the United Nations)

CAADP: Comprehensive Africa Agriculture Development Programmed

EAC: East African Community

R&D: Research and Development

IFPRI: International Food Policy Research Institute

AfDB: African Development Bank

FSNAU: Food Security and Nutrition Analysis Unit (for Somalia)

GIEWS: Global Information and Early Warning System (on Food and Agriculture)

OECD: Organization for Economic Co-operation and Development

TÜİK: Turkish Statistical Institute (Türkiye İstatistik Kurumu)

IPARD: Instrument for Pre-Accession Assistance for Rural Development (EU program)

CAP: Common Agricultural Policy (of the European Union)

TAGEM: General Directorate of Agricultural Research and Policies (in Turkey)

TÜBİTAK: Scientific and Technological Research Council of Turkey

IUU: Illegal, Unreported, and Unregulated (fishing)

EMENA: Eastern Europe, Middle East, and North Africa (region)

GAP: Southeastern Anatolia Project (Türkiye's major irrigation/agricultural development project)

iii. Abstract

Agriculture is key to the economies of most developing countries, particularly in fragile settings like Somalia. This study is centred on the three main subsectors of agriculture (livestock, crop production and fisheries) in Somalia and other lessons are derived from Turkey in which the country has embarked upon modernization of agriculture. Using global and national secondary data, the paper identifies sectoral contributions and maintains that the country has great potential to develop its agriculture sector in a sustainable way.

The results reveal that although agriculture contributes about 70% of Somalia's GDP and employs more than 80% of the population, the sector is highly susceptible to weather vagaries, lack of infrastructure, weak institutions, and low level of technology utilization. Instead, Turkey has shown the way in which strategic investment in irrigation, rural development, research, and international market access can modernize agriculture and build economic resilience, in the face of problems as diverse as water scarcity and land fragmentation.

The study identifies common vulnerabilities and distinctive developmental paths through comparative analysis. Türkiye's experience provides key lessons for Somalia with critical investment focus areas in climate adaptation, institutions and smallholder-farmer support. By linking current challenges in Somalia to effective models for development, this research contributes to the continued debate around sustainable agricultural growth in fragile states and provides real lessons for policymakers seeking to create a more resilient future.

1. Introduction

Agriculture is a critical sector of the national economy in most developing countries and plays an exceptional role as such in Somalia; being the bedrock of rural economy, food security. In Somalia agriculture particularly livestock, fishing and crop production significantly contribute to GDP, exports, employment, food security and livelihood food security. But the industry has long been hampered by readjustments, frequent dry spells, political unrest and crumbling infrastructure. But: Even with these limitations, the opportunity for agricultural expansion is vast, and the sector is essential for wider economic development in Somalia.

The agricultural industry in Somalia has long been neglected, as it has in many sub-Saharan African countries. Such institutional fragility becomes increasingly disturbing when seen in the context of rapidly growing population, climate change, impoverishment of soil, decreasing availability of water, fluctuation in the price of food and inadequate infrastructure. In reaction to these newfound pressures, the Somali government has begun to recognise the importance of agriculture in not only increasing rural livelihoods as well as food security, but also to enhance Somalia's profile as a competitor in agricultural markets around the world.

Despite policy instruments being put in place such as the Comprehensive Africa Agriculture Development Programme (CAADP), the sector grapples to overcome serious internal and external constraints. These factors include low investment in agricultural research, inadequate infrastructure, low adoption of contract farming, weak policy environment, poor public expenditure allocation in agriculture, fragmented institutional coordination, and the continued trajectory of climate change.

The Somali economy is essentially based on a combination of pastoral activities and traditional subsistence farming of cereals and other crops, such as sorghum, millet, maize, and cowpeas, with livestock and camel exports serving as the *raison d'être* of the economy. And the growing of crops (such as sorghum, maize and sesame supports local food requirements, and the fertile land along the Juba and Shabelle rivers also allows more intensive cultivation of fruit, vegetables and cash crops, including banana and sesame. However, the sector is still confronted with various challenges that impact on productivity and sustainability.

There is a need for the sector to be modernized and re-energized in order to improve food security, alleviate poverty, and foster inclusive growth. Furthermore, involvement in regional institutions such as the East African Community (EAC) provides an opportunity to learn best practices, to address coordination problem and the structural issues.

In order to better understand the enormous potential for transforming the agricultural sector in fragile contexts, the report compares the agricultural sector of Somalia with that of the country Türkiye, which has witnessed dramatic agricultural modernization. The Türkiye example of reformation in agriculture is instructive. Through diversified and technologically advanced agriculture, Turkey has established the necessary infrastructure, strategic policies, and an effective

utilization of international markets. Turkey's own agricultural success story is a good reference point here. Turkey, as a country transformed from traditional to modern agri-food system, also offers evidence how governments' investment, market access and institutional reform efforts translate the structure of agriculture market from local to global. Türkiye has become one of the players in three sub-sectors of agriculture, crop production, animals husbandry and fishery. All these sectors not only add to food security but to national income, employment and increase in export. Yet an appreciation of the Turkish model may lead to possible strategies that can be fine-tuned to the peculiar requirements of Somalia. It is that teaches Somalia important lessons. By looking at agricultural sector of the two countries, this research looks to draw lesson and devise concise schemes that could promote growth of agriculture and economy in Somalia.

Although agriculture contributes significantly to Somali employment, income, and exports, its role in the economic growth of the country has not received the same attention in academia. There is little closure in terms of comparative studies of how countries like Türkiye have handled sectoral transitions that Somalia might copy. This gap is intended to be addressed in this thesis through the examination of the contribution of agriculture, in particular livestock production, to the growth of the economy in Somalia. This will also be compared with how Türkiye developed its sectors in order to get relevant lessons and policy recommendations.

The present study relies purely on secondary sources data obtained from international organizations like FAO, the World Bank, and official government sources of both Somalia and Turkey. The focus of the analysis will be on the data from the last 10 years, 1990–2025, and the scope will restrict to agricultural output, mainly livestock and crops production, and related measures. This is not a data generating project so no data will be gathered (e.g., surveys or interviews).

It is those questions that will organize this study:

1. How does agriculture, especially livestock, currently contribute to economic development in Somalia?
2. What are the key issues and constraints in Somali agriculture?
3. How has Türkiye succeeded in strengthening its agriculture, and what are the policies behind it?
4. How can the experiences of Türkiye's agricultural transformation be applied to the Somali environment to induce more prosperous economy?

This study has academic and policy implications. By contrasting the agricultural challenges between Somalia and Türkiye, the study will help enhance the literature on agriculture in post-conflict economies. In addition, the results may provide relevant suggestions and lessons to policy makers and development organizations who are interested in enhancing productivity gains, food security and inclusive growth in Somalia.

2. Literature Review

2.1 Theoretical Framework: Agriculture and Economic Growth

Economists have long been aware of the important role that agriculture plays in the early phases of economic growth. Development economists such as Lewis have stressed the importance of increasing productivity in agriculture during the early stages of development. Agriculture can ignite structural transformation when it allows labor to move from low-productivity farming to more valuable industrial activities. Furthermore, as rural incomes go up, the demand for goods and services rises, feeding into broader economic activity. This model holds that the surplus of labor available in a largely subsistence agricultural sector can simply be passed to an expanding industrial sector where productivity is higher and hence, economic growth will directly follow. The model also points to the need for higher farm productivity in order to free-up labor and capital to assist with industrialization, particularly in the early phases of development.

Another important theory is the agricultural multiplier effect that argues investment in agriculture leads to growth in other sectors. For example, increased farm incomes generate an increase in demand for goods and services, promote the growth of rural non-farm employment and small enterprises. It has been shown through empirical research by the World Bank and FAO that every dollar spent on agriculture in low-income countries can yield two to three dollars of GDP growth (FAO, 2017).

Secondly, agriculture is fundamental for rural development and the reduction of poverty. Most of the poor in rural areas in the low-income countries, depend directly on agriculture for the livelihood, food and security. Improving productivity, value chains, and market access can make significant differences to rural incomes and food security that will promote inclusive economic growth (World Bank, 2018).

2.2 Agriculture in Developing Economies: Key Trends and Challenges

Agriculture is still the spine and bone of the economy in much of Sub-Saharan Africa. It also employs over 60 percent of the workforce and is a major contributor to the GDP. Unfortunately, the industry is riddled with numerous industry barriers, that prevent the industry from reaching its full potential.

Agriculture is a vulnerable activity to climate change. Repeated droughts, floods, and temperature changes are causing crop failures and a reduction in the number of livestock. Productivity gains are hindered by inadequate adoption of technology, such as poor use of improved seeds, fertilizers, and irrigation. Inadequate infrastructure, particularly in rural areas, hinders market access and raises post-harvest losses. Finally, political instability and poor governance are typically obstacles for investment and for effective policy implementation (FAO, 2021; IFPRI, 2020).

Despite these constraints, agriculture is a central focus of economic transformation plans in most of Africa. Nations are increasingly turning to regional frameworks such as the Comprehensive Africa. Agriculture Development Programme (CAADP) in which national investments are

harmonized with larger continental objectives. Cross-country analysis across Africa and Asia demonstrate that state investment in irrigation, value chain development, market access, serve as the principal agents towards agriculture-led growth (IFPRI, 2019; World Bank, 2020). But conflict-prone and institutionally weak states, such as Somalia, typically lag due to prolonged war and fragile institutions.

2.3 Somalia's Agricultural Sector

Somalia's agricultural sector reflects many of the general patterns seen across sub-Saharan Africa, but is also markedly shaped by the effects of decades of civil conflict and the resultant institutional fragility. Agricultural sector contributes for around 70% of the GDP, employs 80% of the work force, and brings about 50% of export earnings to the country (Federal Government of Somalia, 2023, p. 1).

Agriculture is a cornerstone in the economy of Somalia as the sector accounts for about 50% of the country's people and also contributes to 65% of their 12 million population's GDP. GDP per capita in Somalia Somalia's GDP per capita has been increasing slowly over the past ten years, grew up from approximately \$237 in 2011 to \$644 in 2023 which implies the economy is growing but it is hampered by economic and political challenges (World Bank, 2024).

The industry is limited by frequent droughts, lack of modern agricultural techniques and equipment, lack of infrastructure and ongoing conflict. Key crops are maize, sorghum, and beans, but yields are low. The livestock is also an important industry where camels, goats and sheep are exported.

Productivity is continuously being threatened by climate change and environmental degradation. The Somalian government, in cooperation with the international community, is trying to boost farming by distributing seeds, developing irrigation, and teaching farmers new techniques. But if the sector is having a big impact, it is also because the sector today is mostly underdeveloped, insecure and overwhelmingly dependent on traditional small-scale farming or rain-fed farmers.

It is estimated that the country has 29 M ha suitable for farming by of which about 8 M ha are considered irrigable, mainly from the Shabelle and Juba Rivers (FAO, 2023). Nevertheless, effective land use is prevented by inadequate infrastructure, insecurity, and low investment in technological improvements in agriculture.

The livestock subsector is dominated by the livestock industry, and in particular shoop (sheep and goat) exports, a subsector epitomized by the fact that it generated more than 80 percent of Somalia's export revenues in the mid-2010s (World Bank & FAO, 2018, p. 7). On the other hand, the agricultural production of crops has been decreasing with cereals being produced at less than 40% of the national requirement even under good growing seasons. Food is now heavily imported to Somalia (Federal Government of Somalia, 2023, p. 3). 2019; World Bank, 2020).

Besides crops and livestock, the third realm of agriculture in Somalia, which is emerging but of high potential, is fisheries. It has a 3,300-kilometer coastline and some of Africa's finest fishing waters. However, fisheries as a share of GDP is only 1%, but this is predicted to be over \$180

million per year, if developed to its full potential (Hurlburt & Spivak, 2013, pp. 3–4). The artisanal sector employs many of the coastal population; yet, the lack of processing plants, insufficient national fish consumption, and the infringement of illegal foreign fishing in Somali waters inhibit the economic value. Suggested investment strategies: the closer integration of artisanal and industrial fishing, new regulatory measures for sector development, which can maximize the potential of the sector and reduce Somalia's dependence on livestock exports (Hurlburt & Spivak, 2013, pp. 5–8). These trends highlight the need for a range of diversified and inclusive agricultural policy responses.

More recently attempts were being made to breathe new life into agriculture. The National Development Plan (2020–2024) and the Food and Agriculture Delivery Compact (2023) also provide the adoption scenario for crop, livestock, and fisheries investments. Yet, there remain substantial research and data gaps, particularly with reference to productivity indicators, uptake of climate smart agricultural practices, and analysis of policy implications. Although the World Bank, FAO and AfDB has had technical Reports, academic work on the macroeconomic importance of agriculture in Somalia has been limited.

2.4 Institutional and Policy Constraints in Somalia

Apart from the structural and environmental constraints that the agricultural sector in Somalia is struggling to cope with, institutional and policy-related concerns hamper development. Five key concerns in Somalia agriculture governance and capacity the critical areas of concerns are five that became apparent which are symptom of longer standing weaknesses and failure of agricultural governance and capacity in Somalia.

1. Low levels of investment in agricultural research and development (R&D)

There is very little investment in agri R&D and no system for national research funding. There are local research institutions, but they are so fractured and underfinanced that they produce little, if any, innovation and data for climate-resilient farming, pest control or better crop varieties. This missing R&D ecosystem is constraining Somalia's potential to develop its agriculture.

2. Inadequate outlays for Agricultural Infrastructure

Crucial infrastructure, including irrigation, rural roads and market facilities, for instance, is largely missing or run-down. With a dependence on rain-fed agriculture, food systems in Somalia remain extremely sensitive to climate vulnerabilities. Poor infrastructure constrains both production and access to markets, increasing costs and post-harvest losses.

3. Low utilization of improved agricultural technology

Use of modern farm implements (hybrid seeds, fertilizers, machines) and irrigation is very scarce. There are barriers such as expensive inputs, lack of supply chain, few extension services, and low farmer awareness. This perpetuates dependence on old, low yielding farming techniques that drives food shortages.

4. Policy issues and persistence of NTBs

Somalia does not have a comprehensive national agricultural policy, and the policies of the federal government to date have not always been consistent with the policies of regional states. Such barriers include non-harmonized regulations, no mutual standards and informal barriers to trade which prevent the country from integrating into regional markets. Both domestic and international trade potential is stunted by these policy gaps.

5. Inefficiency in coordinating responses to emergencies and new threats

Scores of crises, including droughts, floods, plague of locusts and livestock health outbreaks, afflict the country. But, responses are generally reactive, scattered and under-resourced. There is weak cooperation between government agencies, nongovernmental organizations (NGOs), and international partners in recovery activities and long-term resilience.

These five factors are very much interconnected, and continue to be bottlenecks in the performance of Somalia's agriculture. The responses will need to be dealt with through collective actions at national and regional levels and backed by appropriate investment and institutional reforms (Ministry of Agriculture and Irrigation, 2023).

2.5 Türkiye's Agricultural Sector

Türkiye's agricultural sector has changed substantially in recent decades from a predominantly subsistence-oriented model to a more diversified and exports-oriented one. This change has been assisted by a range of public investments and institutional reforms and by international market integration and compliance with European Union (EU) standards for agriculture. As Türkiye agriculture is so vital in terms of national food security and rural employment and at the same time has a great role in trade, research and sustainable development. The sector comprises cropping, livestock or and fisheries and aquaculture, each with its own set of support policies and infrastructure. The main components of Türkiye's agricultural economy are discussed further in the next sections.

2.5.1 Challenges in Türkiye's Agricultural Sector

Despite the progress Türkiye has achieved so far in modernization of the agriculture sector, still there are some structural and environmental constraints that prevent effective utilization of the potential. These may be especially useful to note for comparative purposes which demonstrate that, even for relatively high performing agricultural economies, reforms and adaptations are necessary.

Among the most notable challenge is lack of water. It is particularly crucial in areas, such as Central Anatolia and the Southeast, also requiring heavy irrigation works to survive. The country is heavily affected by climate change, with a reduced rainfall of 20 percent forecast in some southern regions (OECD 2016). This problem worsened both by over-irrigation and extraction of underground water supply raises legitimate question of long-term sustainability of Türkiye's water resources. The land fragmentation is another important problem. Agriculture is characterized by small-holder family run plots -many of them less than five hectares. These small areas are broken up and this precludes economies of mechanization and of scale. Even where land

consolidation policy has been adopted, its implementation lags and smallholders still operate at structural disadvantage (OECD, 2016).

Another problem is the migration of rural population to urban areas. Many young people, mainly men, migrate out from rural regions looking for better job opportunities in urban areas. This movement imbalance has resulted in a decreasing and ageing farming population and has consequently been a barrier to the uptake of contemporary agricultural techniques. Low rural incomes, inadequate infrastructure and limited access to public services in farming areas feed this trend (FAO, 2021).

Türkiye also contends with high production costs it must import the majority of its products from abroad. Most of the sector relies on imports of inputs like diesel, fertilizers and pesticides — leaving it susceptible to swings in currencies and global prices. This reliance has in turn been a source of financial stress for farmers – especially small holders – and weakened their ability to confront external shocks (FAO, 2021).

Lastly, as comprehensive as the agricultural support system of Türkiye is, it is fragmented and complex. The distribution of subsidies favors larger private commercial farms and does not necessarily promote innovation or facilitate smallholder participation. Furthermore, spending on agricultural research has been low relative to the countries overall agricultural production. This undermines progress in biotechnology, sustainable agriculture and climate adaptation (OECD, 2016).

Together, these challenges suggest that Türkiye's agricultural development has, as expected, been remarkable but not unfettered. From my point of view of a country like Somalia, willing to learn from Türkiye If they would ever take me seriously but we'll see again I think countries like Somalia would have to seriously reflect not only in the successes as Türkiye but also the continued struggles in such a system.

2.5.2 Crop Production sector

Türkiye is one of the largest producers of several commodities such as hazelnuts, cherries, apricots, figs, and quinces worldwide. Such high added-value crops significantly contribute to export revenue and have established Türkiye as one of the largest players in international horticultural trade (OECD, 2016, p. 42). The country has slowly moved from producing mainly cereals to horticulture and supported by big investments in irrigation infrastructure and land consolidation. The agricultural land of Türkiye is approximately 38 million hectares, and there is considerable regional specialization contributing to efficiency and productivity (OECD (2016), pp. 41–42).

In order to solve the problems of productivity and water use the government of Turkey started working on the projects called the South Eastern Anatolia Project (GAP), which aims at irrigation and sustainable development. These initiatives are supported through rural development, and are also supported through the EU's IPARD (Instrument for Pre-Accession Assistance for Rural Development) aimed at helping Turkish farmers with funding, training, technology, and infrastructure (OECD, 2016, pp. 129–140).

2.5.3 Livestock Sector

The growing improvement in the Türkiye livestock sector, which share in the total agricultural output increased to 51% until 2013, has led to the increasing volume of production and various types of organizations. It encompasses cattle, sheep, goats and poultry production, and is underpinned by fodder production which had expanded to over 2.2 million hectares by 2020 (FAO, 2021, p. 12). State interventions through subsidies, incentives for animal health programs, and up-gradation of breed have contributed towards modernization of this sector.

The emphasis of Türkiye on upgrading veterinary service and feed production has significantly contributed to the disease control and animal production. Turkish Statistical Institute (TÜİK)) The TÜİK highlights high growth rates in the production of meat and dairy products in the last twenty years, leading to an increasingly important position of the country in as supplier of livestock products on regional markets (OECD, 2016, p. 48).

2.5.4 Fisheries and Aquaculture

Fisheries and aquaculture have been rapidly diversified and developed in Türkiye. The contribution of aquaculture to total fish production increased to 53% by 2020 (FAO, 2021, p. 28), with sea bass, bream, and trout being among the most common species. Fish product exports increased from \$97 million in 2002 to \$1.63 billion in 2020, highlighting high levels of integration with the EU and international markets (FAO, 2021, p. 28).

Türkiye has more than 2,100 fish farms and 217 processing plants, and the main centers are in its Aegean and Black Sea coasts. Sustainability is promoted via state regulatory instruments by means of fishing quotas, environmental observation and cutbacks in fleets. Such regulations are intended to sustain marine biodiversity as well as the livelihoods and food security of millions of residents in surrounding coastal communities (FAO, 2021, pp. 26–30).

2.5.5 Policy Framework and Institutional Support

The Turkish government has supported agricultural transformation through coordinated policy frameworks. These include:

- IPARD and CAP alignment (Common Agricultural Policy of the EU);
- Subsidy programs for crop and livestock producers.
- Investment in rural infrastructure, extension services, and research institutions such as TÜBİTAK and TAGEM.
- Promotion of innovation and technology in farming and food processing (OECD, 2016, pp. 124–147).

3. Methodology

3.1 Research Design

This study adopts a qualitative, comparative case study design. It primarily involves qualitative research using secondary data with descriptive statistics. The purpose of this research is to examine the role of agriculture—particularly livestock, crop production, and fisheries—in Somalia’s economic growth, and to compare it with Turkey’s agricultural development experience.

This approach also accommodates the complexity of post-conflict economies like Somalia, where data availability is limited, and institutional systems are weak. It enables the integration of

diverse data types, such as policy documents, development plans, and descriptive indicators, allowing for a nuanced interpretation of how agriculture contributes to economic growth in fragile and stable settings.

3.2 Data Sources

The study relies entirely on secondary data, primarily from internationally recognized institutions and official government publications. The main sources include:

- FAO (Food and Agriculture Organization of the United Nations) reports on Somalia and Turkey;
- World Bank reports on Somalia’s agriculture and macroeconomic development;
- OECD reviews of Turkey’s agricultural productivity and innovation;
- Ministry of Agriculture and Forestry (Turkey) publications, including the Sustainable Food Systems Country Report;
- African Development Bank (AfDB) and Somali government policy documents (e.g., National Development Plan, Food and Agriculture Delivery Compact);
- Shuraako report on the fishing sector in Somalia/Somaliland;
- Recent data from Somalia’s FSNAU Crop Database and relevant country reports.

These documents provide rich qualitative insights and statistical data on agricultural output, employment, exports, challenges, and sectoral policy reforms. They were chosen for their comprehensiveness, relevance, and institutional credibility.

3.3 Data Collection and Selection Criteria

Data were selected using the following criteria:

- **Credibility:** Reports had to be published by well-established organizations (e.g., FAO, World Bank, OECD, government ministries).
- **Relevance:** Only sources with direct information on agriculture in Somalia or Turkey were included, especially those covering livestock, crops, and fisheries.
- **Timeframe:** The study focuses on reports published between 1990 and 2025 to ensure up-to-date insights and recent policy developments.

- **Comparability:** Preference was given to sources that include cross country metrics or sector performance indicators that can be analyzed in parallel.

Data collection involved reviewing institutional websites, academic repositories, and official publications. Special attention was given to accessing the most recent strategic plans, national agricultural statistics, and sectoral evaluations that align with the research objectives.

3.4 Analytical Approach

The analysis follows a comparative document analysis method. Reports and policy documents were examined to extract themes related to:

- The contribution of agriculture to GDP, exports, and employment;
- Sectoral challenges such as climate vulnerability, infrastructure, and technology gaps;
- Government interventions, subsidies, and development programs;
- Institutional frameworks and regional partnerships (e.g., CAADP, IPARD, CAP);
- Sub-sectoral development (livestock, crops, fisheries).

A coding framework was developed to classify and organize data from both countries, enabling a systematic comparison of trends, strategies, and outcomes. The analysis focused on identifying best practices in Turkey that could inform Somalia's agricultural policy, while also recognizing the contextual limitations in transferring policy models from one country to another.

Charts, tables, and descriptive statistics will be used in the findings section to support qualitative comparisons and illustrate sectoral contributions to national development. Where applicable, visual data will be supplemented with commentary on its implications for policy and institutional design.

4. Findings

4.1 Somalia's Agricultural Performance and Challenges

Agriculture is the backbone of Somalia the sector employs 80% of the population and constitutes about 70% of GNP. However, the sector, which is of paramount importance, also faces various challenges such as, frequent droughts, low technology and infrastructure support (Federal Government of Somalia 2023). Potential of fisheries: Somalia has a long coastline of over 3 300 km with a high fishery potential. The sector remains largely underdeveloped and makes only about 1% contribution to the GDP. Fish consumption per capital is very low, hardly 3.3 kg/person/year, compared to world average of 19 kg/person/year. Fishing faces obstacles, such as, IUU fishing activities, lack of infrastructure, and restricted market reach for growth.

Climate Resilience Programs to address climate challenges, the Federal Government of Somalia, in partnership with the FAO and the Green Climate Fund, introduced the “Ugbaad” initiative in January 2025. This is a seven-year programme that will build climate resilience in 41,800 hectares of productive landscape recovering and will reach over 2.1m people, including 1.15m direct beneficiaries.

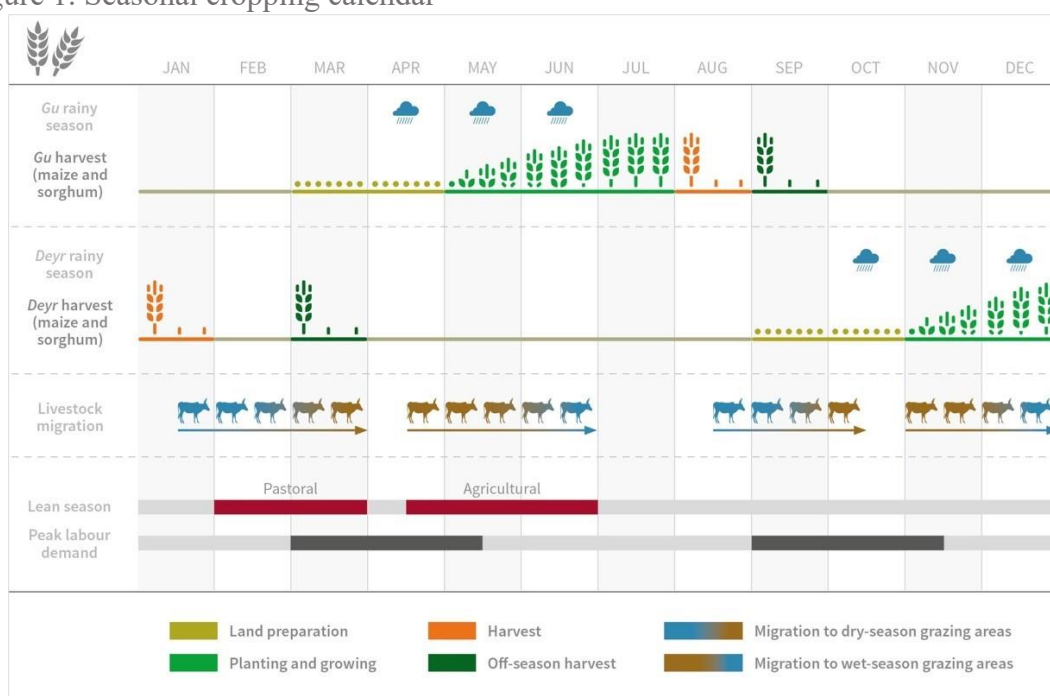
Agriculture is mainly bimodal in Somalia with two agricultural seasons (the Gu or long season which has rains from April to June and the Deyr or short season which is wet from October to December). The Jilaal is warm, sunny and dry from December to (approximately) mid-March. Summary The cool and dry Haggai period begins in July and extends to mid-September (FAO, 2021).

4.2 Crop Production Sector

Crop production in Somalia is predominantly seasonal and rain-fed. There are two main growing seasons: Gu (April to June) and Deyr (October to December). Aggregate 2024 national cereal production was assessed at 127 000 tones, considerably lower, reflecting the effects of erratic rainfall and premature ending of the Gu rains. This deficit has aggravated food insecurity, especially in agropastoral areas where household food supply is usually based on seasonal production. some 18 per cent below the five-year average, largely as a result of erratic and below-average rainfall (FAO, 2025).

Cloud scored 34% among crop farmers while 74% amongst them practised rainfed agriculture. This type of farming is common in Somalia and often subsistence-based. Major rainfed crops include sorghum, cowpea and maize. Canal irrigation ranked second farming system in the opinion of this assessment by 31 percent of 96 households. Among these, 16% used pump and 15% practiced manual irrigation. Irrigation agriculture was practiced mainly in Lower Shabelle, Middle Shabelle, Lower Juba, Middle Juba, Hiraan, Gedo and Bakool regions.

Figure 1. Seasonal cropping calendar



Source: FEWS NET, 2021; FAO, 2021.

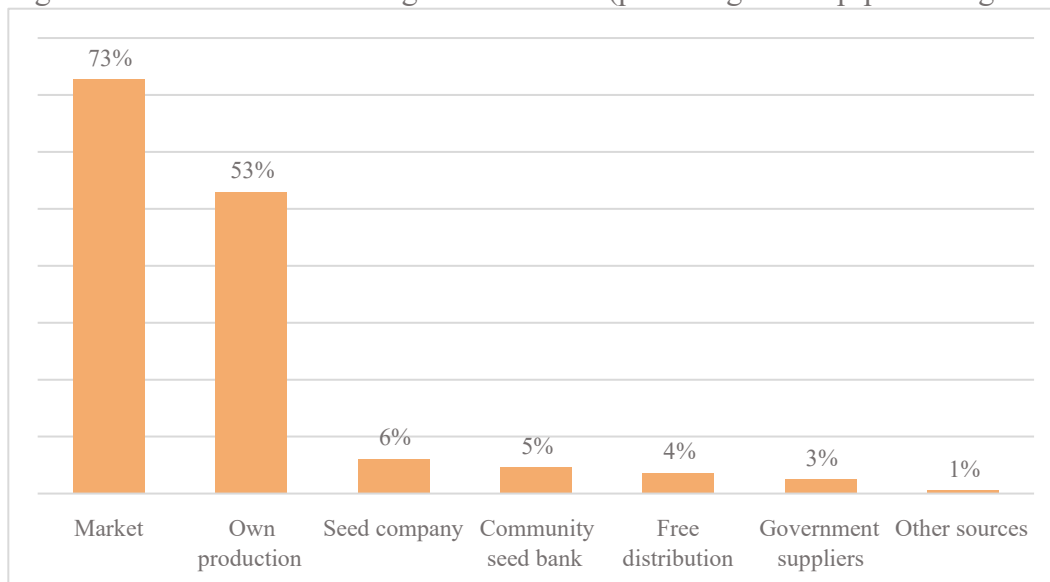
This calendar illustrates the periods of land preparation, planting, and harvesting, alongside livestock migration and lean seasons. Understanding this cycle is key for planning seed distribution, emergency aid, and agricultural interventions.

Somalia has an estimated 29 million hectares of cultivable land, with 8 million hectares of irrigable land, concentrated mainly along the Juba and Shabelle rivers. However, due to underinvestment and conflict, only a small portion is currently utilized (FAO, 2023).

Although 73 percent of farmers purchased seed in the *Gu* season, 53 percent utilized seeds from their own production. Other farmers accessed seeds from seed companies (6 percent), community seed banks (5 percent), free distribution from donors (4 percent) and government supplies (3 percent) (Figure 2).

The majority of extension officers indicated that farmers were experiencing seed-access challenges. Agricultural input venders reported an increase in the number of customers obtaining seeds on credit. They also indicated that there were no government-imposed COVID-19 restrictions in their areas of their operations, but that they had experienced transport challenges along with shortages of seeds, fertilizers and veterinary inputs.

Figure 2. Sources of seed during the Gu season (percentage of crop-producing households)



Source: FAO, 2021; FAO assessment results, August 2021.

Figure 0.11: Production of Cereal in Somalia, 1961–2015

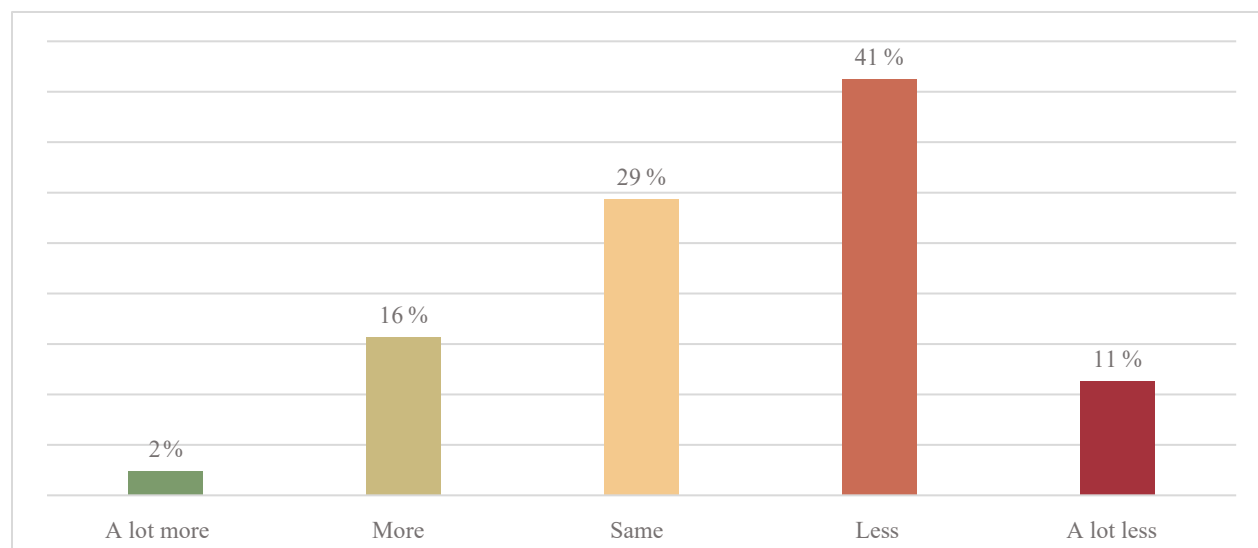


Source: FAOSTAT for 1961–94, FSNAU for 1995–2016.

Note: Annual figures include mid-year Gu harvests and end-of-year Deyr harvests (of January of the following year).

According to GIEWS of the FAO Somalia faced a low cereal production during the Gu season (FSNAU and FEWS NET, 2021). There were also indications of below-average Gu crop production in southern Somalia, and unfavorable crop production prospects in agropastoral livelihood zones, Food Security Zones in the Northwest. Crop production in the Gu season was below-normal for 53 percent of respondents as compared to a normal year (18 percent for above-normal, and 29 percent for normal) (Figure 3).

Figure 3. Change in harvest in Gu season compared to a typical year (percentage of crop-producing households)



Source: FAO, 2021; FAO assessment results, August 2021.

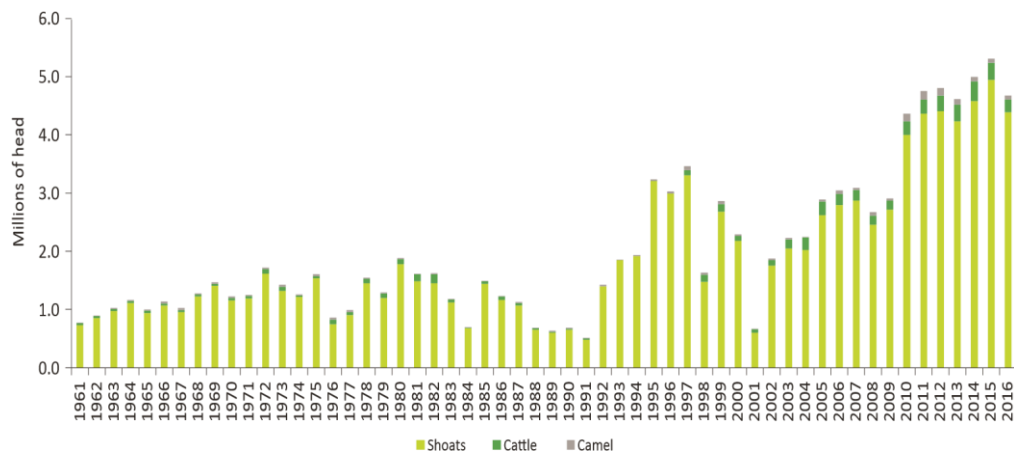
Many regions reported below-average harvests in 2021 and 2022 due to drought, flooding, and seed unavailability. These production shortfalls are a major contributor to food insecurity and dependence on imports.

4.3 Livestock Sector

Among all the respondents, 45% engaged in livestock as the only form of their agricultural practice. This was carried out in the middle of calving for both cattle and camels. For the livestock rearing, 43% said the sales of livestock and livestock products were their main source of income while 13 percent said it was a supplementary source of income. Livestock production households (%) The percentages of the households whose major agricultural activity was livestock production was larger in Galgaduud, Bari, Awdal, Nugaal, Bakool, Togdheer, Mudug, Gedo and Sanaag in comparison with Lower Shabelle, Middle Shabelle, Hiiraan and Lower Juba. The respondents' livestock comprise goats, cattle, camel, sheep and poultry. According to extension agents, the most important animal products are meat, milk, ghee and skin and hides.

Somalia has the most camels (7.1 million) than any country in the world. A significant investment by the diaspora and by Saudi-owned companies in quality enhancement, plus some donor-funded interventions, has stimulated impressive expansion of livestock exports, including for breeding. Both volume and value (reaching a peak of \$533 million in 2015) have been higher than pre-civil war levels (figure 0.7). On the other hand, processing of livestock products is negligible, and far below prewar levels.

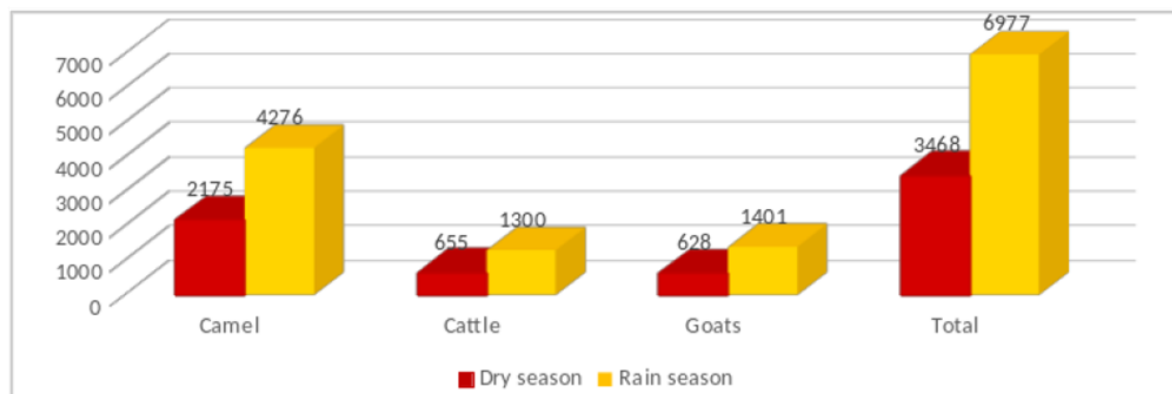
Figure 0.7: Livestock Exports by Somalia, by Type, 1961–2016



Source: Data for 1961–88 are from FAOSTAT and reflect official government data. Data for 2002–16 are from FSNAU. Data for interim years are as reported in the FAOSTAT database, but they are unofficial figures, projections, and estimates, whose source and methodology is unknown. Export figures for cattle are missing between 1992 and 1994. Shoats are sheep and goats.

Milk is a key nutrition source in pastoralist communities, and is normally consumed more in the household during the dry season (Center, 2019). Milk production in the various ecological zones of the nation creates employment and income in both rural and urban areas, especially those engaged in trading, a sector in which women dominate. Production and gross market value of Somalia the total production of camel milk in 2014 was estimated at 1,115,826 tons, while the gross market value was 1,650,177 USD. Camels are able to convert more milk from poor grade forage in comparison with other lactating animals, they provide 2.5-3.5 liters milk per day. Milk production varies inversely to the season; Milk is abundant (wet season of Gu and Deyr); Milk is not abundant in different periods of Hagaa and Jilaal and during dry periods.

Figure 2. Milk production in Somalia (ton) (2017)

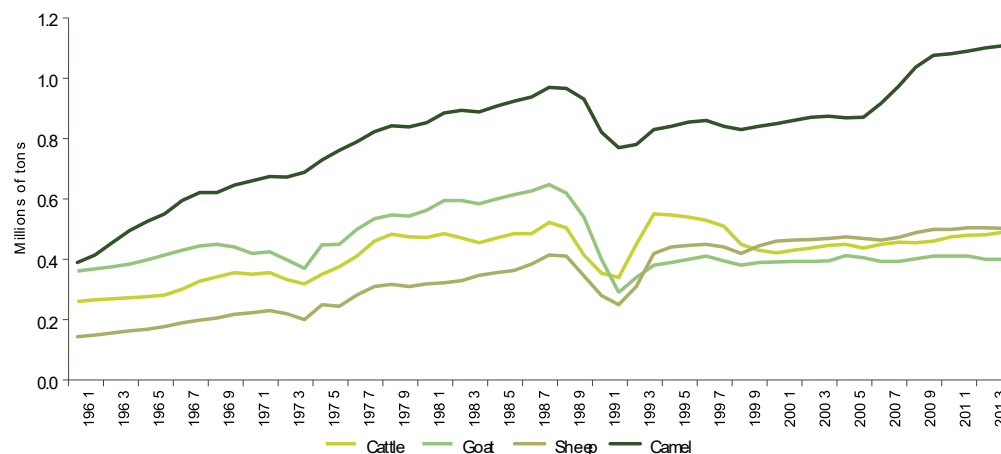


Source: FAOSTAT, 2017.

Milk production has been increasing continuously since the late 1980s. By 2013, there were 1.1 million tons of camel milk produced, with a gross market value of approximating \$2.7 billion (of which \$1.65 billion is only for camel milk) (figure 0.8). Estimates calculated in the Drought Impact Needs Assessment (Somalia 2018) suggest that total, baseline milk production was \$3.3 billion in 2014–2015 (\$2.7 billion of which was camel milk). In spite of such a high production, Somalia is still a net importer of dairy products, as it has no exports. The structural barrier to growth of the dairy sector are the same as those that impact on the welfare and health of live animals, and the non-implementation of the low, wildly out of date prewar hygiene standards, unsterilized milk, the lack of impounding facilities, the failure to grade milk, the burden of the face to face marketing which reduces potential for realizing returns at the farmgate, poor roads, the passage of time after milking and curdled milk given temperature and humidity, are causes of reduced price, lack of economies of scales.

The production of fresh meat has increased to supply ever increasing domestic demand, yet is still far from its potential. Commercial meat production is only in small quantity of chilled goat and beef meat for export. Nearly all of the challenges enumerated above — along with mismanagement have hindered growth. The number of hides and skins compares to the late 1980s, when about 7 million pieces were in year. Raw hides and skins are not of the best quality, because poor preservation and storage frequently allows them to be eaten into by vermin. As opposed to before the war the processing is now minimal (sun-dried only), with virtually no production of skins.

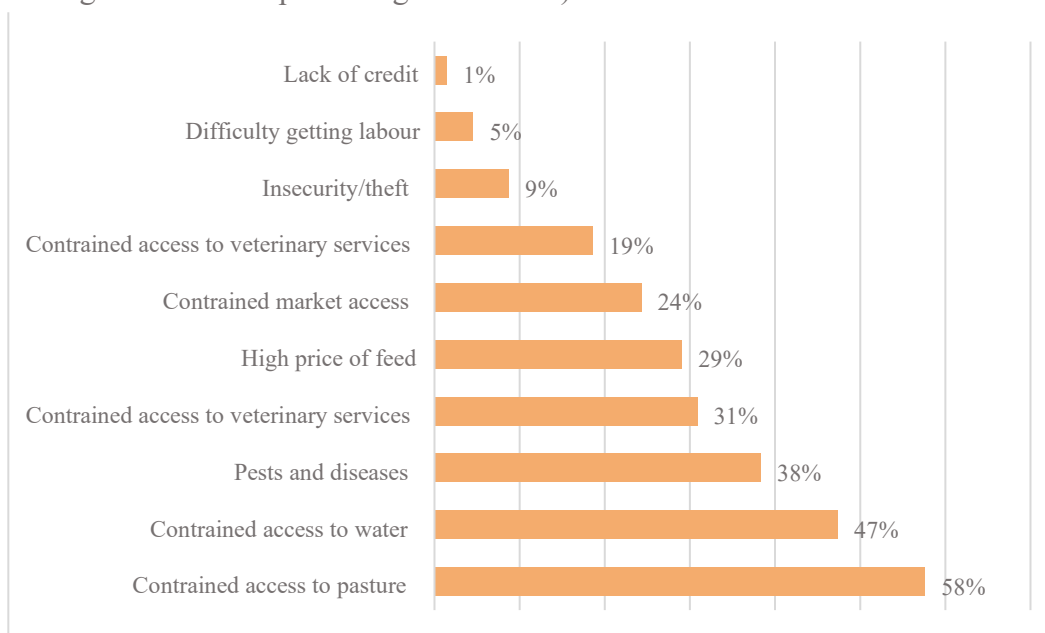
Figure 0.8: Production of Fresh Raw Milk in Somalia, by Milk Type, 1961–2014



Source: FAOSTAT

Livestock, particularly camels, goats, and sheep, remains the backbone of Somalia's exports. The country's economy is significantly shaped by pastoralism and agro-pastoral systems. Half of livestock-producing households indicated difficulties rearing animals in the previous three months. The main challenges indicated were constrained access to pasture and water, pests and diseases, constrained access to veterinary services, high cost of feed, constrained market access and constrained access to veterinary services (Figure 4).

Figure 4. Difficulties experienced by livestock producers in the previous three months (percentage of livestock-producing households)

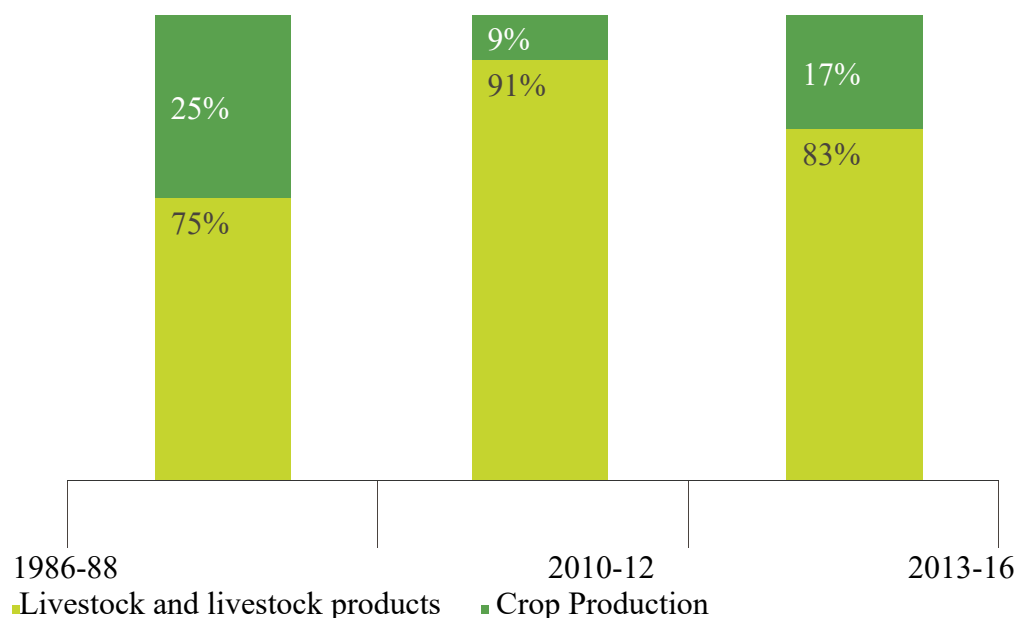


Source: FAO, 2021; FAO assessment results, August 2021.

Extension officers mentioned major problems in the livestock sub-sector: restricted grazing; shortage of veterinary inputs; livestock theft; market constraint, diseases of livestock and low prices. Common diseases in regions like Awdal, Bari, and Hiraan were reported as foot and mouth disease, sheep and goat pox, and camel pox. Drought-related problems caused livestock deaths, and forced herders to cull young animals in order to save milk-producing females.

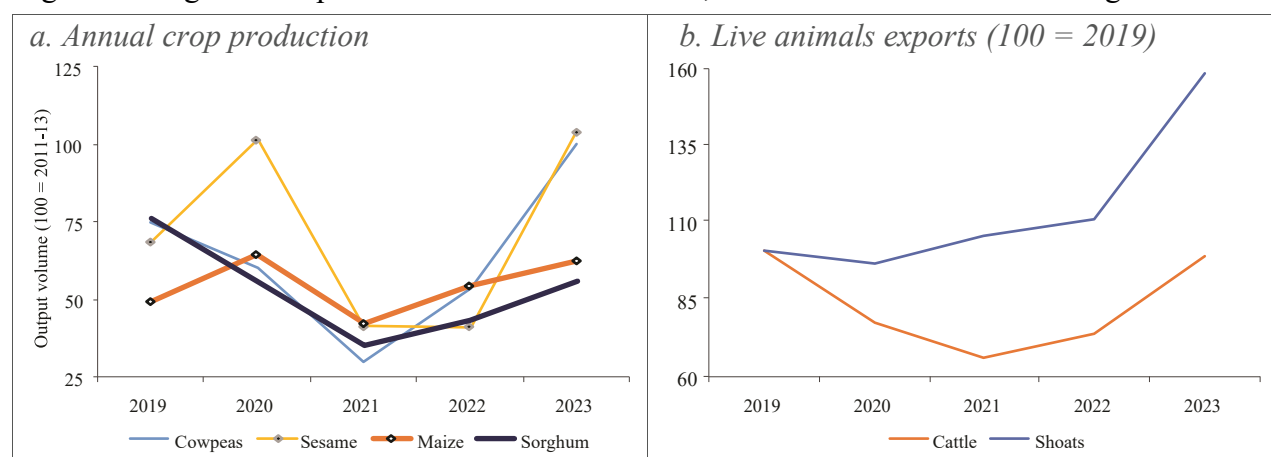
Approximately 60% of livestock-keeping households were affected by the closure of the markets during the COVID-19 pandemic, which also resulted in income losses, increased transportation and food prices and reduced veterinary services. Over the years, livestock's role in agricultural output increased, with crops' share declining, from 75 percent of the value of total agricultural output in the 1980s to 83 percent by the mid-2010s.

Figure 0.3: Relative Shares of Livestock and Crop Production in Somalia, 1986–88 to 2013–16



Source: Somalia 1989 (official National Accounts for 1977–88), FAOSTAT for 2010–12, and Somalia 2018 for 2013–17.

Figure 2.2: Agriculture production rebounded in 2023, from the 2020–23 severe drought



Source: World Bank staff estimates using data from FAO Somalia (2024). Note: Livestock export data cover both Berbera and Bossaso ports.

Agricultural production in Somalia rebounded in 2023 following the end of a prolonged drought, supported by above-average rainfall during both the Gu and Deyr seasons. As shown in **Figure 2.2**, crop production particularly maize and sorghum—increased by 23% compared to 2022, though it remained 5% below the five-year average due to flooding. Livestock exports also

recovered significantly, with shoats and cattle increasing by 43% and 35%, respectively, due to improved pasture and water availability

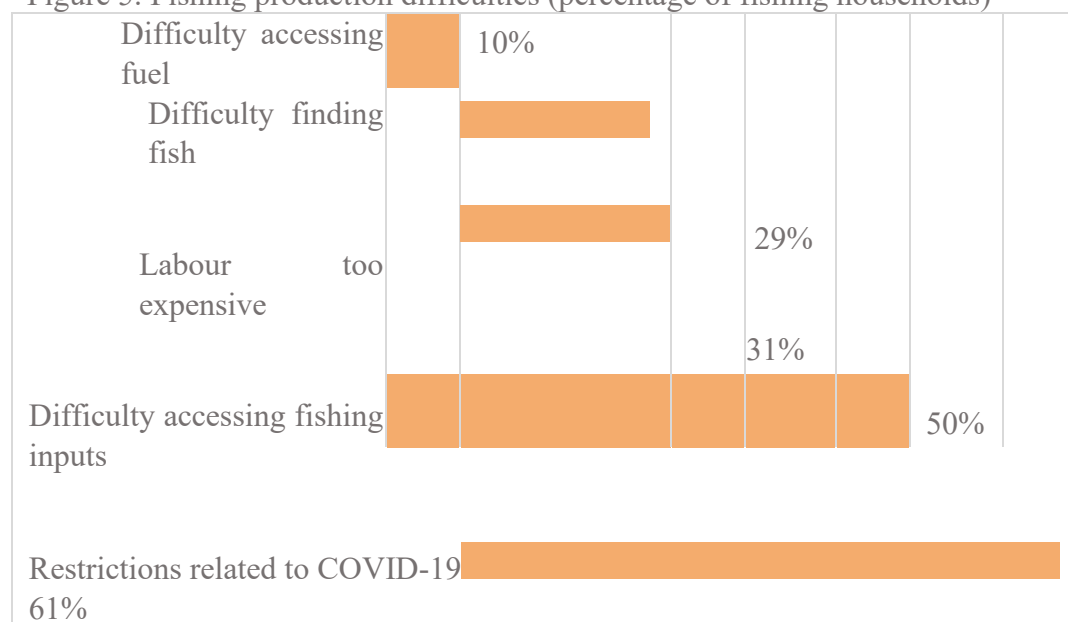
4.4 Fisheries Sector

Despite a coastline of more than 3,300 km, Somalia's fisheries potential remains largely untapped. Nevertheless, the fisheries sector makes a low contribution to GDP as a result of reasons such as inadequate infrastructure, poor law enforcement against illegal fishing, and low levels of fish products consumption in domestic markets. Yet the industry accounts for no more than 1% of G.D.P. Per capita fish consumption is very low at 3.3 kg/year against a world average of 19 kg (FAO, 2021).

Fishing is part of the seasonal full- or part-time livelihoods of many pastoralist and other rural people and also provides a nutritional and monetary contribution to household budgets. During the period of the strongest south-west monsoon winds, there is no fishing at all on most of the Indian Ocean coast of Somalia, and many of the coastal peoples reverted to a pastoralist life. (World Bank and FAO 2018) A total of 95 percent of interviewed households that had engaged in any type of marine-related activity reported engaging in coastal fishing; the majority took place in the Red Sea and Indian Ocean. The rest use methods such as open-sea fishing (3 percent), fishing in rivers and lakes (2 percent) and aquaculture (1 percent).

Difficulties in fish production in the three months preceding the survey were reported by 26 percent of fishing households. These included restrictions associated with the COVID-19 pandemic, difficulties accessing fishing inputs, expensive labour, difficulties finding fish and challenges accessing fuel (Figure 5). Inputs that households had the most difficulties accessing were fishing gear, nets, boat repairs, bait and ice.

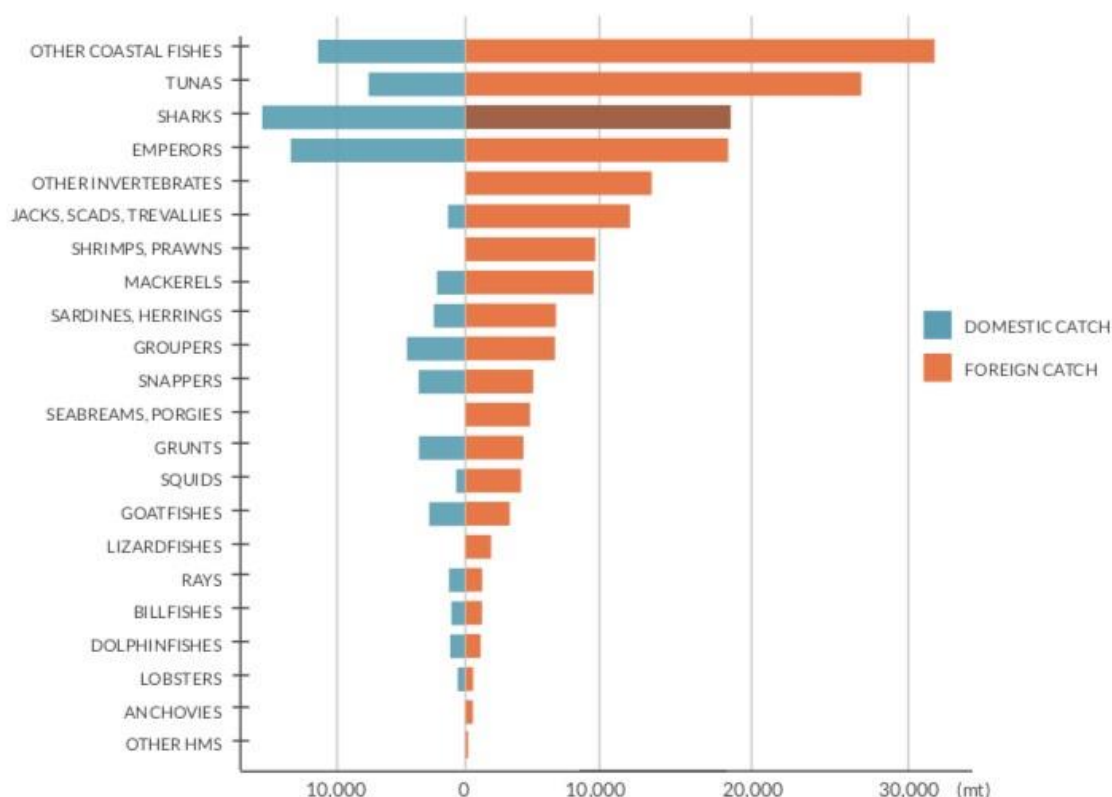
Figure 5. Fishing production difficulties (percentage of fishing households)



Source: FAO, 2021; FAO assessment results, August 2021

The agricultural sector's contribution to the economy remains unknown, because of lack of reliable and consistent data across all products for output, farmgate prices, and input use. Largely because of the dramatic increase in the relative importance of livestock production and exports, the combined share of the four main agricultural subsectors (livestock, crops, forestry, and fishery) is guesstimated to have risen significantly from its prewar level of about 62 percent of GDP to about 75 percent (and possibly even higher). Before the civil war, the crop subsector was the second-largest contributor to GDP and exports (after livestock). It remains crucial for food security, but its contribution to the economy is much smaller than it was, because cereal output declined by almost 60 percent from its 1989 peak.

Figure 3a. Map of distribution of fishing catch, by species for the national fleet, in the IOTC area of competence (most recent year e.g. 2017).



This chart illustrates the comparison between domestic and foreign fishing catch volumes in Somali waters, categorized by species. It highlights the disparity between local (Somali) fishing activities and those carried out by foreign fleets. This information also underscores the need for the sustainable management of the Somali fisheries. The country's waters are teeming with underwater diversity, but locals believe their environment is being exploited by foreigners. Investment, training, and enforcing fishing rights in the domestic sector may increase domestic growth and food security to local populations.

4.5 Türkiye Agricultural Performance and Challenges

Agriculture and Food Sector in Türkiye | Türkiye's agriculture and food sector has a strategic importance, in terms of both guaranteeing food security at national level and contributing to rural development. As of 2023, Türkiye's agricultural gross value added is 68.5 billion USD, the share of agriculture in GDP is 6.2%, and the proportion of employed persons in the sector is 14.8%. Sector has increased its size by 400% in the last 20 years therefore becoming Europe number one agricultural producer. Industry strengths include the market size relative to the country's young population, a strong private sector economy, significant tourism revenue, and a favorable climate.

Türkiye is 10th in the world in agricultural production, and first in the world in the supply of figs, apricots, cherries, quinces and hazelnuts. It is the largest producer in the world of dried apricots, apricot kernel oil, dry figs, hazelnuts, peaches and nectarines, and second place in exports of quinces, raisins and flour (wheat). Türkiye has produced 24 million tons of milk and is the producer of great milk-whey. Besides, Türkiye has a total of approximately 11,000 plant species whereas the total species in Europe is 11,500.

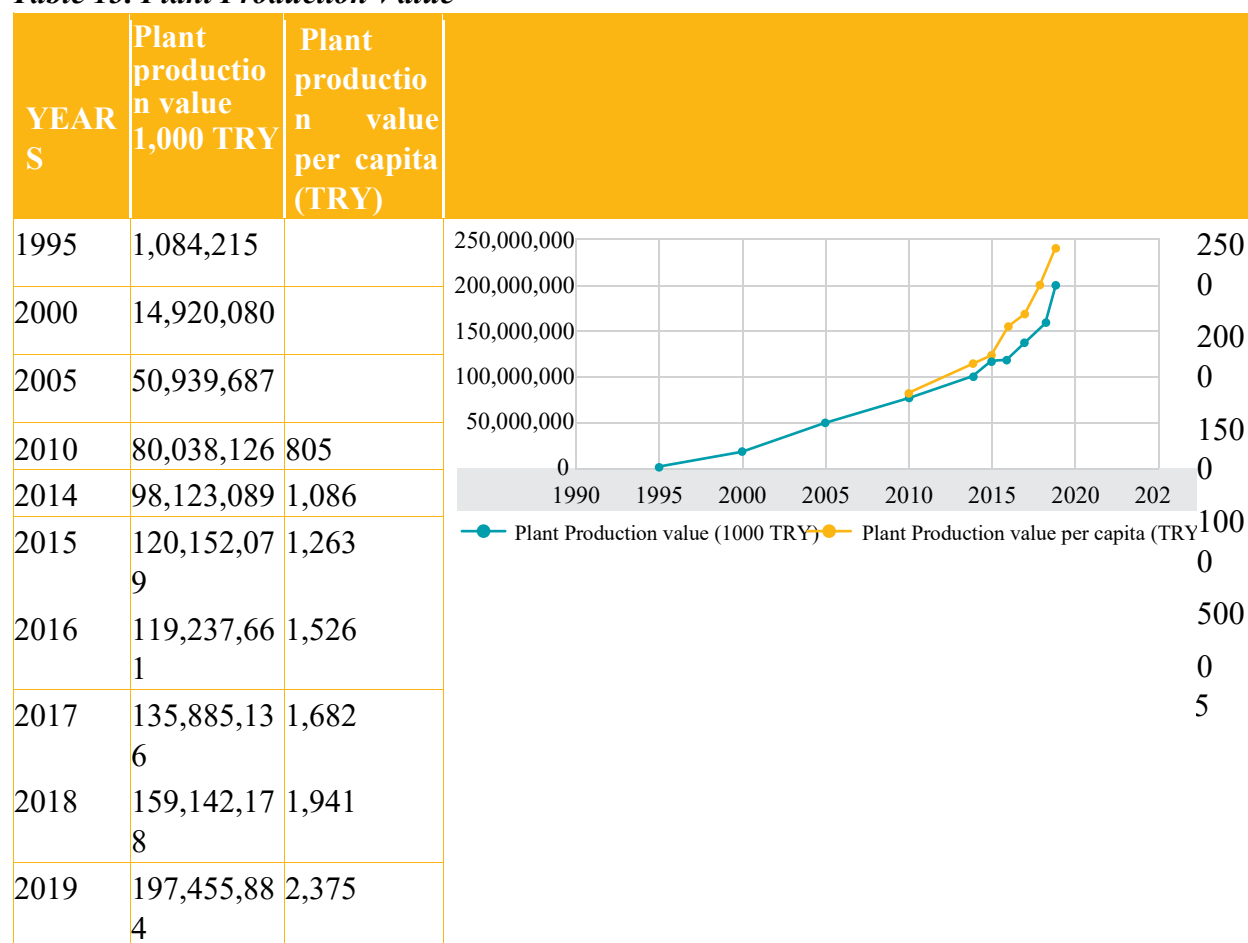
Thus, this rich production enables Türkiye to keep its trade balance quite positive, with the status of being among the biggest exporter of agricultural products in EMENA. Worldwide, Türkiye exported close to 1,800 varieties of agricultural products to over 190 countries in 2022, totaling USD 30 billion in export volume. There are good investment prospects for Türkiye in the subsectors of agribusiness as greenhouse production, animal and plant-based proteins, seed, walnuts and almonds, pet food, baby food, aquaculture, etc.

4.6 Crop Production Sector

Türkiye ranks in the world's top ten agricultural producers, and crop production factors prominently as an economic output and trade commodity. In 2023, the fruits, beverage and spice crop yield in Türkiye totaled 27.4 million tons 2.3% more than the previous year's yield. At the same time, cultivation of vegetables increased by 5.6%, amounting to 33.6 million tons in 2024 (TÜİK, 2024).

Agricultural land in the country accounts for approximately 38 million ha, including specific zones for cereals, fruits, vegetables and industrial crops (OECD, 2016:41–42). Projects such as the GAP (the Southeastern Anatolia Project) have increased options for irrigation including horticulture at a premium and reduced the need for rain-fed agriculture.

Table 13. Plant Production Value

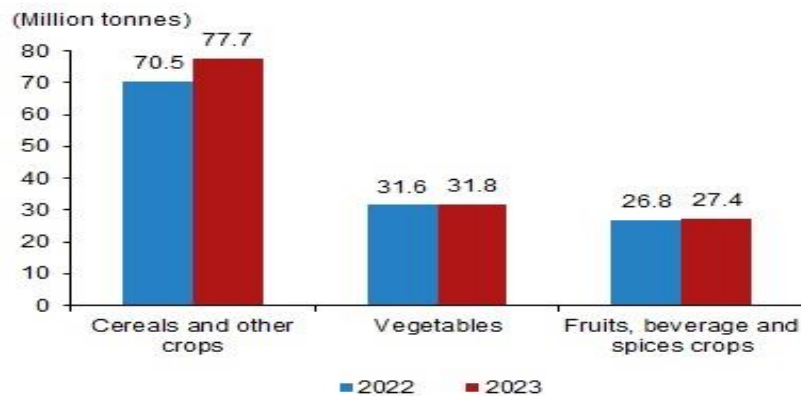


Source: TURKSTAT (2019)

The value of Türkiye's plant production is larger than its value of livestock and animal products; according to TURKSTAT statistics. Summary of plant production are given for the selected indicators, derived from the Agricultural Structure Research that is published by TURKSTAT. By size of economic entity, 80.7 per cent of agricultural economic entities have small area of land < 10 hectares, and 25.9 per cent of them (more than another quarter) have land size of 2-2.9 hectares. 24.5% of the farms had between 20 and 49.9 hectares of land. (Ministry of Agriculture and Forestry, 2021). An important addition, Türkiye is the world's largest producer of hazelnuts, apricots, cherries, and figs, and the leading exporter of dried fruits, including apricots and raisins. Production of 24 million tonnes of milk in 2022 is another evidence of interrelated concept of crop and animal farming in Turkey (Invest Türkiye, 2024).

In 2023, production quantities of cereals and other crops (except fodder crops) increased by 10.3%, vegetables increased by 0.6%, and fruits, beverage and spices crops increased by 2.3% when compared with the previous year. Production quantities for 2023 became approximately as follows; 77.7 million tonnes for cereals and other crops, 31.8 million tonnes for vegetables, and 27.4 million tonnes for fruits, beverage and spices crops.

Crop production, 2022, 2023



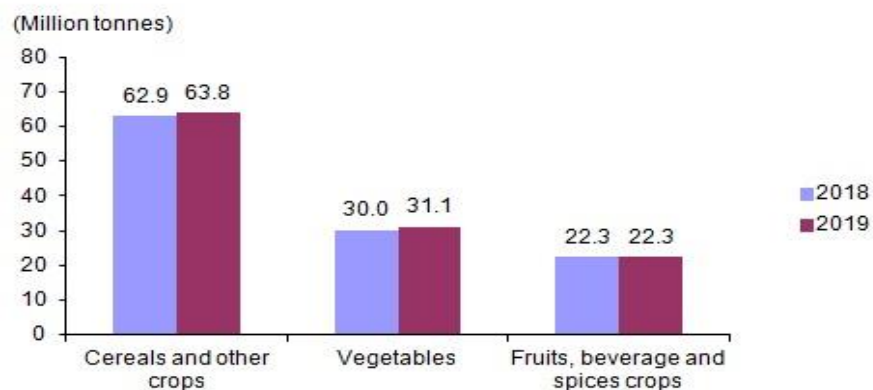
Cereals production increased in 2023 when compared with the previous year

In 2023 cereals production increased with a rate of 9.1% when compared with the previous year and approximately became 42.2 million tonnes. Wheat production increased by 11.4% to become 22 million tonnes, barley production increased by 8.2% and became 9.2 million tonnes, rye production increased by 11.7% and became 305 thousand tonnes, oats production increased by 12.3% and became 410 thousand tonnes when compared with the previous year.

In the dry pulses group, chick pea, dry beans, red lentil production became respectively 580 thousand tonnes, 240 thousand tonnes, 424 thousand tonnes. The production of potatoes, one of tuber crops, increased by 9.6% and became 5.7 million tonnes.

In the group of oil seeds, soybean production decreased with a rate of 11.3% and became 137.5 thousand tonnes, and sunflower production became approximately 2.2 million tonnes with 13.8% decrease. Sugar beets production increased by 22.1% and became 23.5 million tonnes. (Turkish Statistical Institute [TÜİK], 2023).

Crop production, 2018, 2019



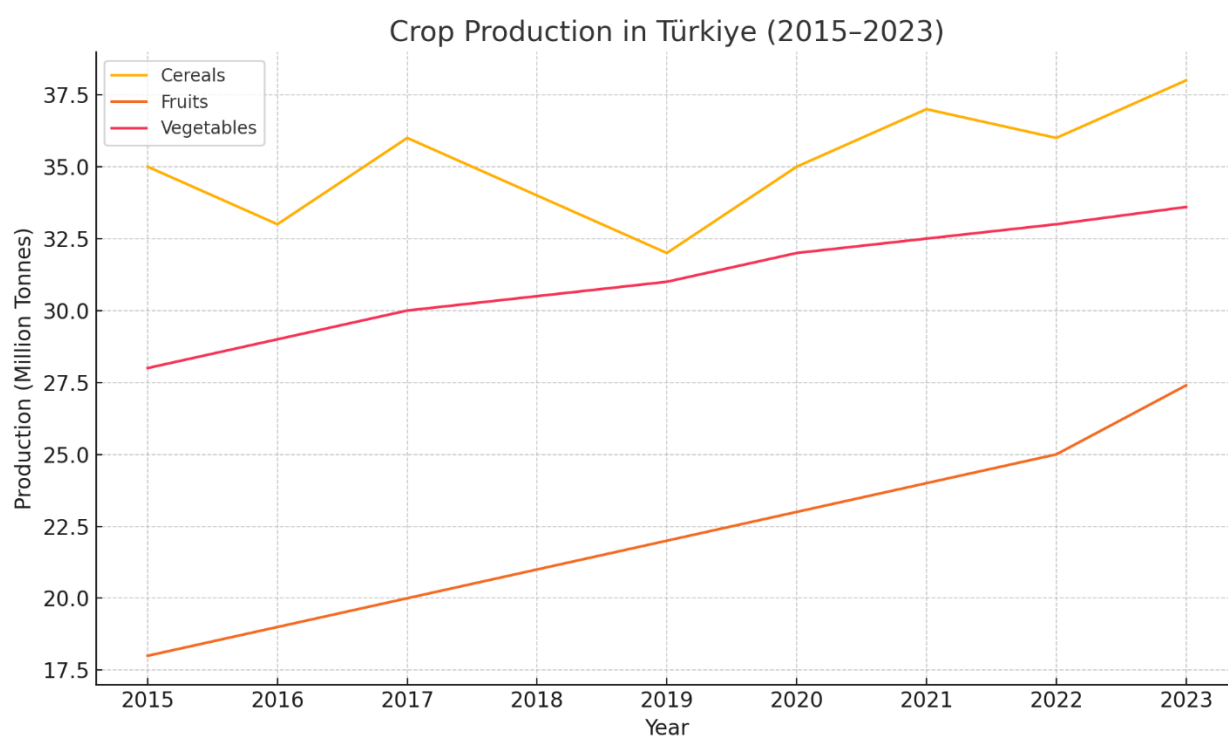
Cereals production decreased in 2019 when compared with the previous year

Cereals The cereals output fell to 0.02% in 2019 compared to the previous year was approximately 34.4m tonnes. Wheat production fell by 5% to 19 million tons, barley production increased by 8.6% to 7.6 million tons, rye production fell by 3.1% to 310 thousand tonnes, oats production rose by 1.9% to 265 thousand tonnes, in comparison with the previous year.

In the legumes group a decline was observed in consumption of broad beans of 7.1% and amounted to about 5.5 thousand tonnes, in the green lentil of 1.5% and was 43.6 thousand tonnes and in the plants of tuber, among other things, the potatoes this increase was 9.4% and amounted to approximately 5 million tonnes.

In the category of oil seeds, soybean production rose by 7.1 % reaching 150 thousand tons. Tobacco production reduced by 7 per cent, 70 thousand tonnes as, sugar beets production became 7.3 (\$18.1 million) million tonnes, up 3.7 per cent. (Turkish Statistical Institute [TÜİK], 2023).

Figure 1: Crop Production in Türkiye (2015–2023)



The line chart indicates annual dynamics on production of three main crop categories in Türkiye for the period of 2015-2023: cereals, fruits, and vegetables. The data, which is estimated from data provided by TÜİK and which is harmonized with the data published by OECD and FAO, reveals the seasonal and short-term structural fluctuations in this field as well as the long-term structural growth in this field.

Cereals Cereal production fluctuated because of climate variation and water availability, although the trend was positive and it peaked at around 38 Mt in 2023. This is a 9.1 per cent higher than 2019 that coincides with government efforts to provide more irrigation and a favorable weather.

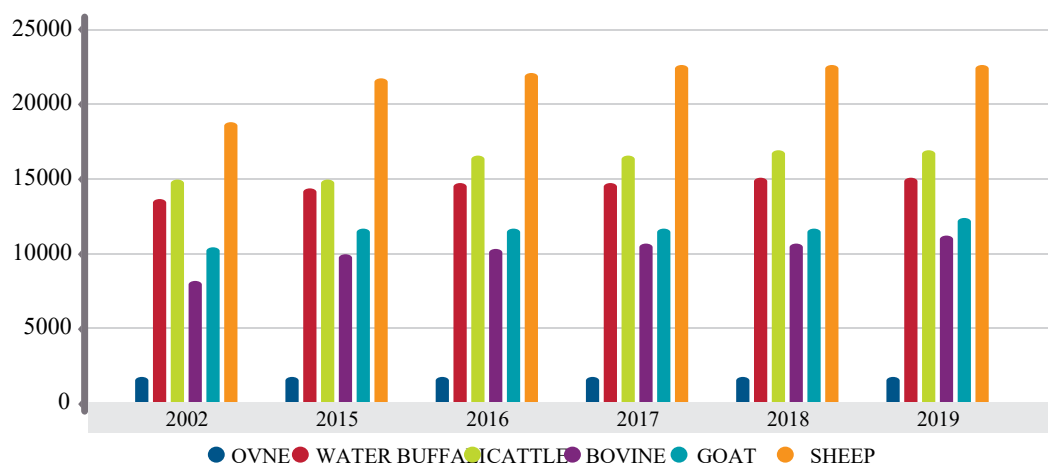
Fruits fruit production steadily grew during the period, from 18 million tonnes in 2015 to 27.4 million tonnes in 2023. The impetus is partly Türkiye dominating international markets for some fruits including cherries, apricots and figs, but also due to facilitators in the form of export-friendly policies and upgrades to orchard. Vegetable production continued to increase from one year to another and had reached around 33.6 million tons by 2023. This enhancement gives the product the features of better greenhouse farming, crop diversification, drip irrigation technology.

4.7 Livestock Sector

Livestock farm is one of the vital economic sub sectors in the agriculture with determining added values it brings, employment it creates, its contributions to the national income; resource support it gives to different branches of food, textile, pharmaceutical and livestock tools, equipment and cosmetic industries and bed food and balanced protein nourishments it makes available. It is also a social sub-sector of agriculture with the contribution it makes to rural development in terms of employment. Accurate global figures for livestock population according to FAO estimates have been presented in the table below. (Ministry of Agriculture and Forestry, 2021, p.118).

Table 45. World Livestock Assets (Head)

		2002	2015	2016	2017	2018	2019	2002- 2019 Change %	2015- 2019 Change %
		million	million	million	million	million	million		
WORLD	WATER BUFFALO	168.75	199.65	200.52	201.08	202.77	204.34	21.10	1.91
	CATTLE	1332.96	1452.01	1470.41	1477.80	1494.16	1511.02	13.36	2.76
	BOVINE	1501.71	1651.66	1670.93	1678.87	1696.93	1715.36	14.23	2.66
	GOAT	783.69	1004.13	1031.05	1045.22	1060.87	1094.07	39.60	6.11
	SHEEP	1036.14	1183.90	1197.36	1211.12	1217.62	1238.72	19.55	3.45
	OVINE	1819.83	2188.04	2228.41	2256.34	2278.49	2332.79	28.19	4.68



Source: FAOSTAT

Türkiye's livestock value, animal product value, livestock per capita value, and animal product per capita value increased significantly from 1995 to 2020. In the 1995-2020 period, livestock value increased by 300 times and animal product value increased by 244 times, while livestock value per capita tripled and animal product value per capita doubled in the 2010- 2020 period.

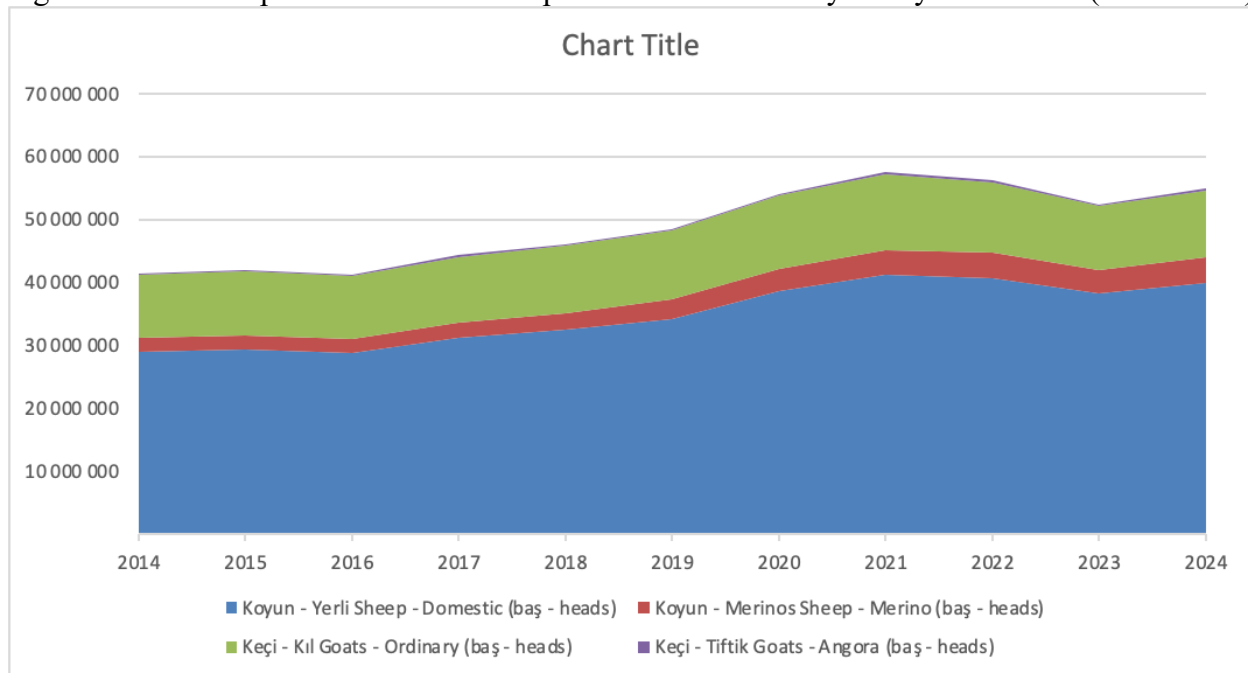
Table 47. World Rankings in Cattle and Water Buffalo Assets (Head) (2019)

Cattle			Water Buffalo		
Ranking	Country	Head	Ranking	Country	Head
1	Brazil	214,659,840	1	India	109851678
2	India	193,462,871	2	Pakistan	40,002,000
3	USA	94,804,700	3	China	27,338,428
4	China	63,542,332	4	Mainland China	27,336,130
5	Mainland China	63,391,934	5	Nepal	5,308,664
6	Ethiopia	63,284,177	6	Myanmar	4,082,914
7	Argentina	54,460,799	7	Egypt	3,476,396
8	Pakistan	47,821,000	8	Philippines	2,873,561
9	Mexico	35,224,960	9	Vietnam	2,387,887
10	Sudan	31,489,000	10	Bangladesh	1,490,000
22	Türkiye	17,042,506	20	Türkiye	178,397

Source: FAO

In 2019, Türkiye ranked 9th in sheep population and 24th in goat population in the world.

Figure 2: Sheep and Goat Population in Türkiye by Breed (2014–2024)



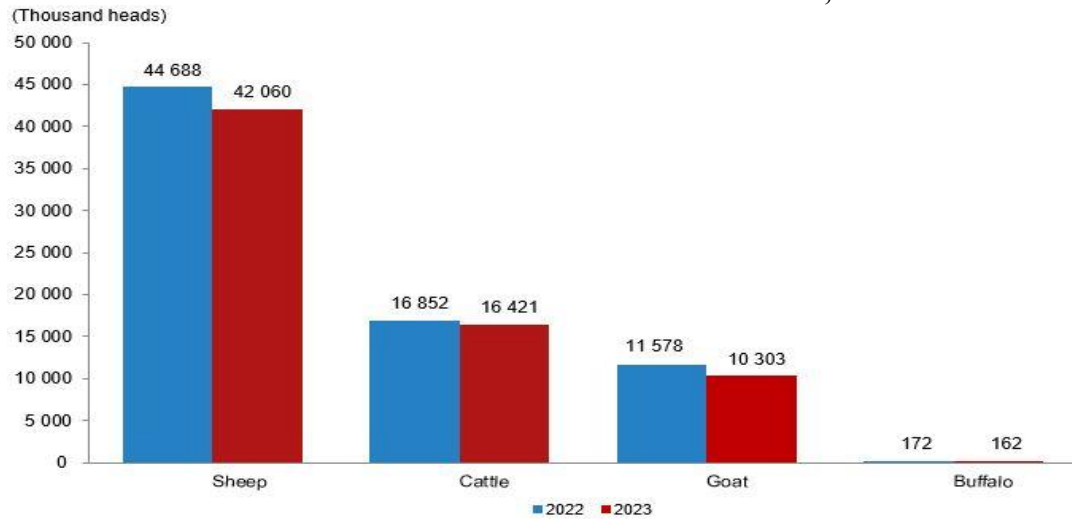
Source: (TÜİK,2024). Animal Production Statistics 2014–2024

This chart presents the population trends of key small ruminant species in Türkiye, specifically local and domestic sheep (Yerli), Merino sheep, ordinary goats (Kıl), and Angora goats (Tiftik). Over the period from 2014 to 2024, Türkiye's total small ruminant population shows a steady increase, peaking around 2021 before a slight decline in 2022 and a recovery in 2024.

The data highlight the dominance of Yerli sheep, which form the majority of the ruminant population. Ordinary goats (Kıl keçisi) also show consistent growth, likely due to their adaptability to mountainous and arid regions. In contrast, Merino sheep and Angora goats, which are raised for their specialized wool, make up a much smaller share but show gradual increases, reflecting policy support for value-added livestock production.

This growth trend underscores Türkiye's strategic role as a leading producer of sheep and goats in the region. It also aligns with national efforts to boost meat, dairy, and wool output through breed improvement and veterinary support programs.

Number of animals, 2022-2023

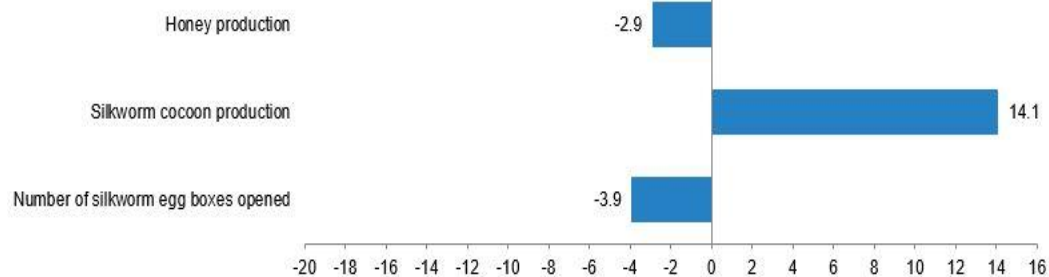


Source: TURKSTAT 2023

Silkworm cocoon production increased, honey production decreased

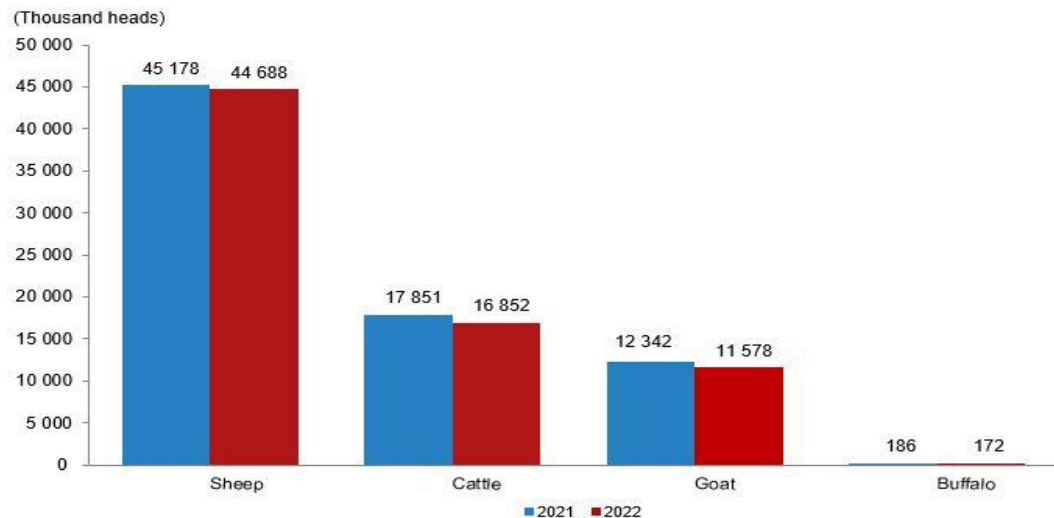
Amateur honey production decreased by 2.9% in 2023 compared to previous year and realized 114 thousand 886 tonnes. The number of egg boxes opened fell by 3,9 percent to 5 thousand 360 units and silkworm cocoon was 14,1 percent increase Compared to the previous year, the m cocoon production was 78 tonnes.

Annual change ratios for other animal products (%), 2023



Source: TURKSTAT 2023

Number of animals, 2021-2022



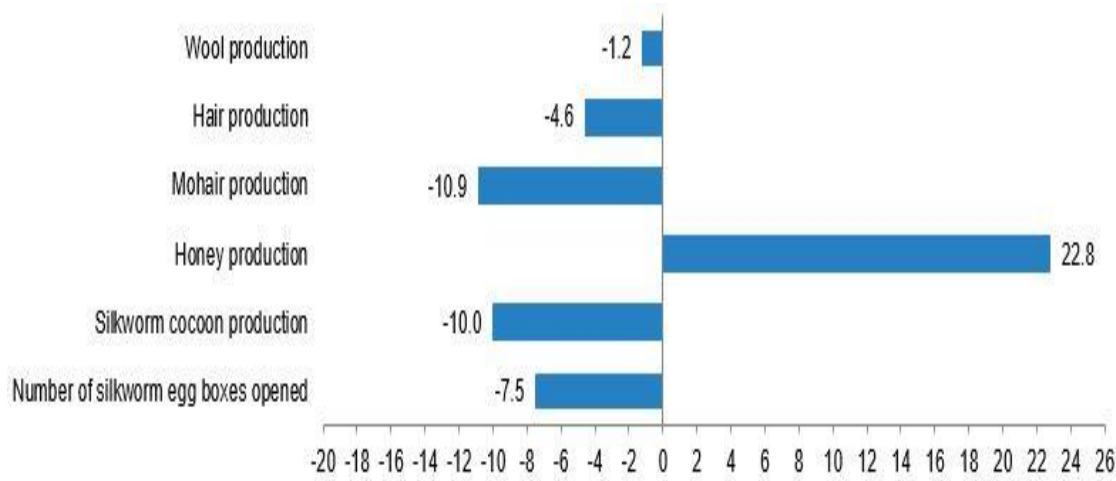
While wool, hair and mohair, silkworm cocoon production decreased, honey production increased

The amount of wool production decreased by 1.2 percent to become 84 thousand 885 tonnes, the amount of hair production decreased by 4.6 percent to 6 thousand 393 tonnes and the amount of mohair production decreased by 10.9 percent to 417 tonnes, compared to the same period of the previous year.

Honey production rose by 22.8% in 2022 in comparison with previous year, reached to 118 thousand 297 tons.

Villages engaged in sericulture in 2022, the number of villages in action of sericulture decreased by 15.9% over the previous year, to reach 559 units. Number of households engaged in sericulture decreased by 12.9%, to 1,761 units. The number of egg boxes opened was less by 7.5 percent totaling to 5 thousand 577 units and the productions of silkworm cocoon was less by 10 percent totaling to 69 tons.

Annual change ratios for other animal products (%), 2022



4.8 Fisheries and Aquaculture Sector

Türkiye is a country that is bordered on 3 sides by seas with varying ecological, geographical, geomorphological, and meteorological characteristics and productivity potentials. Turkey, with coast of the Black Sea, the Aegean and Mediterranean while having the complete Marmara Sea, which is a partly in-land sea. CRHW has 25 river basins, in which there are many rivers, 200 natural lakes, 822 dam lakes and around 507 ponds providing wide scope of fisheries and aquaculture.

This means big chances in terms of aquaculture hunting and breeding. There are enough fishing vessels and technology, and also aquaculture facilities, technology and manpower of Türkiye to employ these resources. References [1] Türkiye's overall fish production has continued to fluctuate over the years based on fisheries production and between 2010 and 2020, 653-785 tons of fish has been produced annually. And, like global production, Türkiye's aquaculture production is on the rise; percentage of aquaculture contribution to total is also on the increase, as follows.

Türkiye: The production of fish in Türkiye in 2020 was 785,811 tons; 37.2% were sea fish, 5.0% other sea products, 4.2% inland sea products and 53.63 % were aquaculture products. The fishery catch was 364,400 tons and the aquaculture production was 421,411 tons. (Ministry of Agriculture and Forestry 2021: 131).

Table 61. Türkiye Fisheries and Aquaculture Production (tons)

Years	FISHERIES			AQUACULTURE			TOTAL PRODUCTION
	Sea	Inland Water	Total	Sea	Inland Water	Total	
2010	445,680	40,259	485,939	88,573	78,568	167,141	653,080
2011	477,658	37,097	514,755	88,344	100,446	188,790	703,545
2012	396,322	36,120	432,442	100,853	111,557	212,410	644,852
2013	339,047	35,074	374,121	110,375	123,019	233,394	607,515
2014	266,078	36,134	302,212	126,894	108,239	235,133	537,345
2015	397,731	34,176	431,907	138,879	101,455	240,334	672,241
2016	301,464	33,856	335,320	151,794	101,601	253,395	588,715
2017	322,173	32,145	354,318	172,492	104,010	276,502	630,820
2018	283,955	30,139	314,094	209,370	105,167	314,537	628,631
2019	431,572	31,596	463,168	256,930	116,426	373,356	836,524
2020	331,281	33,119	364,400	293,175	128,236	421,411	785,811
2010-2020 Change %	-25.67	-17.74	-25.01	231.00	63.22	152.13	20.32

Source: TURKSTAT

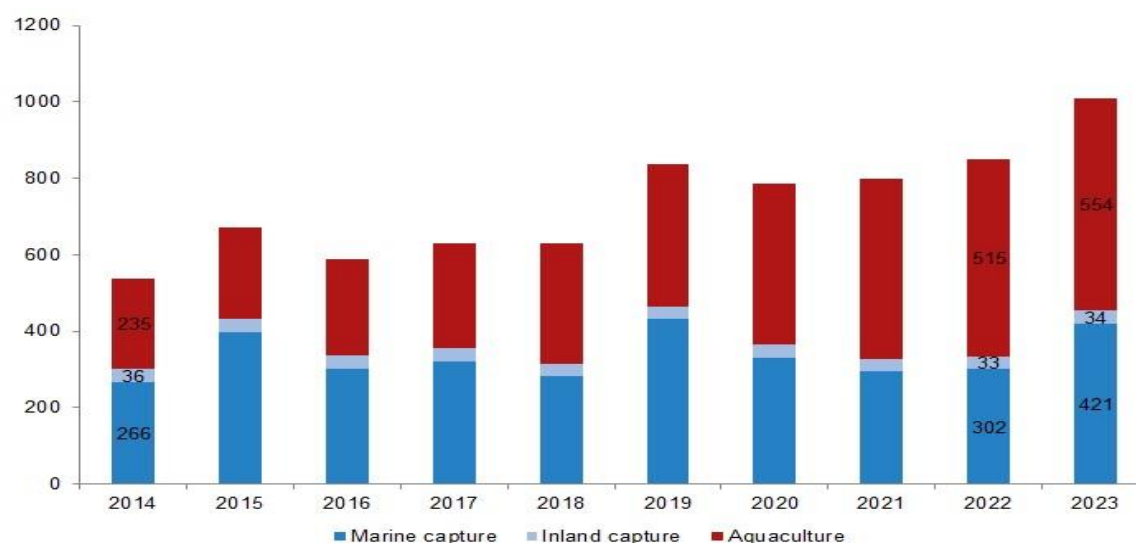
Overview 80-90% of Türkiye's capture fisheries production is fish among the rest, other sea products such as crustaceans and molluscs.

Production of fisheries exhibited a fluctuating trend during the recent years. This variation from year to year in fishery is induced by variation in catch of migratory fish such as anchovy, sprat, and bonito, which are the main target of fishery. The yield of these stock fish depends on a number

of environmental events such as the climate change, biology of the fish and water temperature. Because of the high fishing power of the fishing fleet, measures were taken after 2002 to limit the vessels fishing and to avoid new additions to this fleet to allow stocks to recover. Between 2012 the size of the fleet has been reduced Whilst buy-back support has been in-place, which saw the number of vessels in the fleet reduce by 1264. As of the end of 2020 there were 15,302 vessels possessing sea fishing licenses, and 3,181 inland water- licensed vessels. (Ministry of Agriculture and Forestry, 2021, 132).

Overall fisheries production exceeded 1 million 7 thousand 921 tons in 2023, increasing by 18.6% over the previous year. Productions of the total fishery consisted of the caught sea fish by 38.4%, the caught other sea products by 3.3%, the caught inland water products by 3.3%, and the aquaculture products by 55.0%. Fishery product landing in 2023 also rose by 35.5 percent. Capture production accounted 454 thousand 59 tonnes, and aquaculture production was 553 thousand 862 tonnes. The volume of marine products caught was 39.4% greater than the previous year, The amount of inland water products was up 0.8% on the previous year.

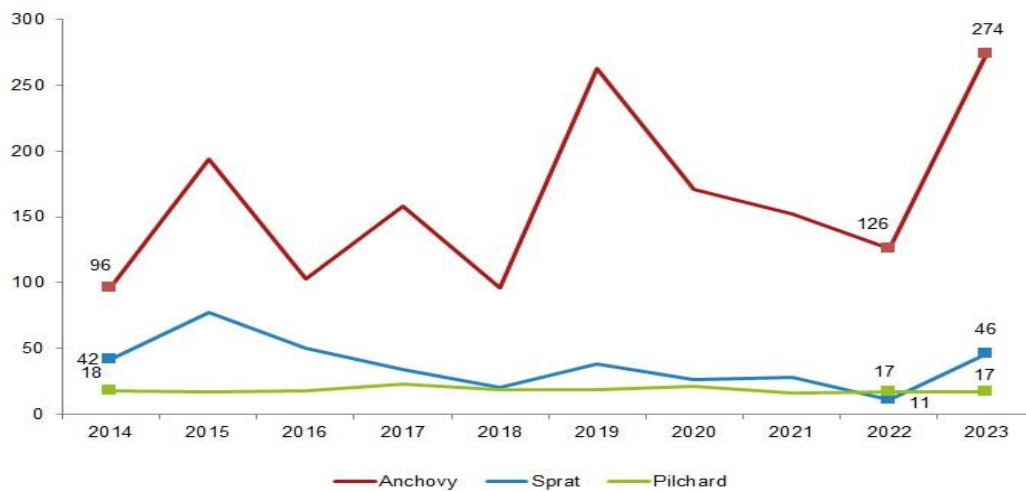
Fishery production, 2014-2023



Source: **TURKSTAT 2023**

The amount of catch of sea fish happened 387 thousand 115 tons. As the season of fishing were looked for sea fish, with 273 thousand 915 tons of capture the most caught fish were the anchovy. Anchovy was followed by sprat with 42 thousand 764 tonnes and pilchard with 17 thousand 311 tonnes.

The most captured sea fish, 2014-2023



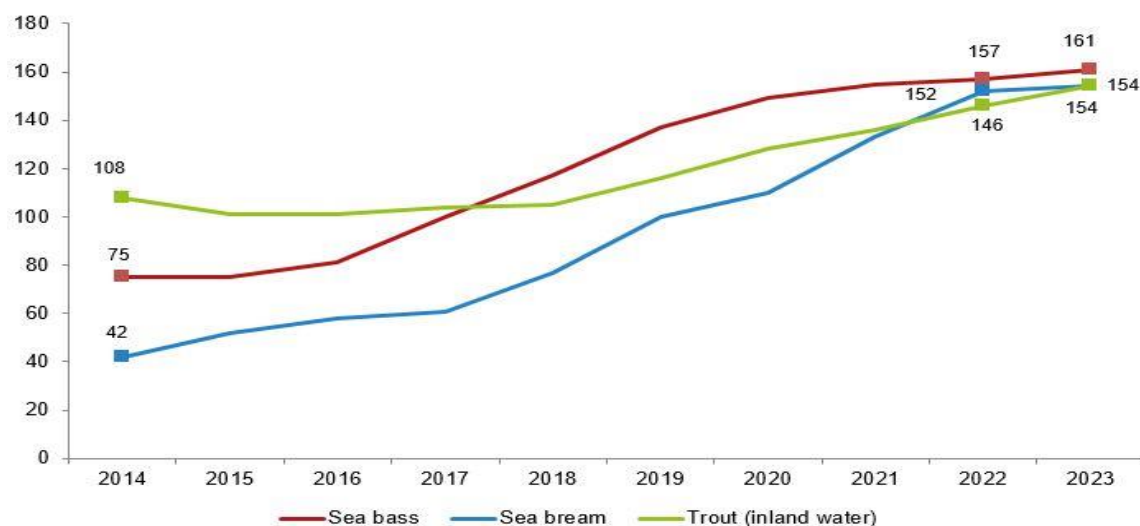
Source:

TURKSTAT 2023

In 2023, aquaculture production increased by 7.6%

In 2023, the production of aquaculture took place 399 thousand 529 ton (72.1%) at the seas and 154 thousand 333 ton (27.9%) at the inland waters. Whereas the most produced at the inland waters was trout with 154 thousand 6 tonnes, the most produced at the sea were sea bass with 160 thousand 802, sea bream with 154 thousand 11 tonnes.

The most aquaculture production of fish, 2014-2023



Fisheries and aquaculture in Türkiye have become one of the most dynamic sub-sectors of its agriculture. Türkiye is surrounded by four seas, the Black Sea, Aegean Sea, Mediterranean Sea

and the inner Marmara Sea and these seas have rich and diverse aquatic habitats. These habitats provide significant production potential for both marine and fresh water aquaculture.

In 2023, total fishery production amounted to about 1,007,921 tonnes, with aquaculture representing 55% of production, testifying to the increasing importance of more managed or sustainable production technologies. The rest were marine capture, with anchovy the highest share, followed by sprat and pilchard. The most supported aquaculture fish are sea bass and sea bream in the marine, and trout in the inland (TURKSTAT, 2023).

Fleet reduction programs and state-financed aquaculture inducements are part of the reason for such growth. As a crucial measure to prevent overfishing and protect marine biodiversity, the number of fishing boats were decreased strategically since 2012. In addition, Türkiye has established more than 2,000 aquaculture farms and 217 processing plants for at both economic and nutritive purposes by the coastal areas (Ministry of Agriculture and Forestry, 2021, 130).

5. Discussion and Comparative Analysis

5.1 Overview of Key Findings

Insights from this study would show that agriculture plays a pivotal role in the economy of both Somalia and Türkiye, but the structure, performance and level of modernization of each sector is quite different. In Somalia, agriculture and in particular the livestock sector, remains the lifeblood of rural livelihoods, food security and export income. But as a sector, it lacks productivity, relies primarily on rains, has poor infrastructure, and reoccurring climate shocks. If potential is there, it is underdeveloped and faces major external shocks, such as capture at sea.

On the other hand, Türkiye's agriculture is more of a diversified, modernized sector. With a significant contribution from crops, livestock, and fisheries, Türkiye's agriculture is supported through strong institutional structures, investment in irrigation and technology, and globalization of markets. Although they also encounter challenges including climate shocks, land fragmentation and worker migration Türkiye has been able to improve on food security, export income and rural wages due to ongoing public and business restraint.

5.2 Comparative Analysis

When we compare Somalia and Türkiye there are some important differences and similarities. Agriculture is the most important industry for both nations in terms of employment and economic activity, but Türkiye's is vastly more productive and competitive globally. Türkiye has realized a remarkable increase in crop yields, livestock products and aquaculture products by investing in irrigation, R&D and value chain. In Somalia, although agriculture accounts for a larger proportion of GDP, the production systems are essentially subsistence-oriented with low utilization of technologies and weak institutional support.

Infrastructure and market access are two of the key divergences. Türkiye has built wide ranging rural infrastructure such as irrigation, processing plants, and transportation to facilitate farmer's access to local and global markets. On the other hand, Somalia is still experiencing severe infrastructure deficits, constraining marketing opportunities and the profitability of agricultural production.

Yet the two countries have their challenges in common. Climate change increasingly threatens agricultural sustainability, whether of Somalia or Turkey, exacerbating droughts, soil erosion, and water shortages. It should be added that both countries have problem with smallholder farm structures but Türkiye has gone further in solving land fragmentation through consolidation.

5.3 Shared Challenges in Agricultural Development

Although Somalia and Türkiye are two countries with different economic development levels but they face similar problem in their agriculture sector. These include:

- Climate change and extreme climatic events, leading to instability of production. Fragmentation of land holdings, providing for little economies of scale and technological modernization.
- Rural youth migrating away and an aging farming population.
- Dependence on market inputs (including fertilizers and machinery) which are subject to price fluctuations.
- Institutional waste and problems of reform at the local level.

Acknowledging common vulnerability provides learning possibilities and targeted policy responses.

5.4 Lessons from Türkiye's Experience for Somalia

The agricultural transformation of Türkiye has several lessons for Somalia. First, investments in rural infrastructure, especially irrigation and transportation, are needed to increase productivity and market access. The second is to bolster the capacity of institutions like agricultural research, extension services, and access to credit, which can help to drive innovation and resilience among farmers. Finally, developing public-private partnerships can fast-track value chain development and entry into international markets.

Finally, the success of Türkiye in aquaculture and animal husbandry improvement underscores the significance of targeted subsidies, quality control systems, and investment in cold chain logistics in sustaining the export of perishable products. But also Somalia needs to beware of the pitfalls that come with too much of the Turkish model, which include excessive reliance on welfare subsidies – without addressing structural productivity deficits.

To conclude, even though the Somali and Türkiye context are very different, Türkiye experience supports that with the right investments, policies and institutions, serious agricultural transformation is feasible even in tough settings.

6. Conclusion and Policy Recommendations

6.1 Conclusion

This paper has discussed the importance of agriculture for the economy of Somalia and compares it to Türkiye's experiences on modernization of the agricultural sector and diversification of the economy. 'While Somalia's economy is now on the right track, we must sustain the reform effort, because the problems in Somalia have been caused by weak institutions with weak governance. Agriculture is the bedrock of the Somali economy, employing most of the people, and accounting for a significant percentage of GDP and of exports. Yet Somalia agriculture sector remains under strain, suffering from inadequate infrastructure, recurrent climatic shocks, meager institutional support and underdeveloped crop and fisheries production.

In contrast, the agricultural case of Türkiye shows that targeted investments, institution building, rural infrastructure, and linking the value chain can result in significantly enhanced agricultural productivity and competitiveness. While Türkiye is not without its own structural problems, including water stress, land fragmentation and a labor shortage in rural areas, its journey also demonstrates the positive impact that coherent agricultural policies and innovation-led approaches can have.

The findings from this study substantiate that Somalia has a promising future in revitalizing its agriculture, improving the rural livelihoods and stabilizing its economy provided that it is implemented with targeted reforms and high investment. Although Somalia and Türkiye have different economic, political, and cultural contexts, Türkiye's agricultural renaissance has several lessons for Somalia as it works towards developing a resilient and inclusive agricultural economy.

6.2 Policy Recommendations

Based Comparative Analysis, the following detailed bring forward policy recommendation to enhance the sector in Somalia.

6.2.1 Investment in Rural Infrastructure

The absence of fundamental rural infrastructure, such as irrigation, rural roads, and market centers, has been one of the most serious obstacles preventing the development of agriculture in Somalia. Bad irrigation access greatly reduces crop yields and access of farmers to roads is poor at best for their use of markets. Somalia could start investment in rural infrastructure to rebuild its agriculture industry. Türkiye Southeastern Anatolia Project (GAP) is a stark example of how investment in irrigation on a massive scale, combined with rural road development, can increase agricultural productivity, raise rural income levels and enhance food supply security. Somalia can tailor these sorts of models at smaller regional scales, to what its resources can currently support.

6.2.2 Support for Smallholder Farmers

Small holder farmers are the backbone of Somalia's agriculture sector, but many struggle to access financial services, new technology and training. Supporting smallholders remains critical

to foster inclusive growth. In order to support rural farmers, Somalia could institute subsidies, training programs and micro credit plans for agriculture. 4 Türkiye's rural development policies, including modes of support like the provision of grants for modernization and targeted access to credit for small- and medium-sized farms prove that supporting smallholders can increase productivity and reduce rural poverty and rural economy diversification.

6.2.3 Strengthening Agricultural Institutions

Somalia's agricultural development continues to be hampered by institutional weakness. Good R&D, extension and data systems are key for encouraging innovation and supporting evidence-based policy-making. Somalia should focus on rehabilitating its agricultural institutions by upgrading research institutions and technologies, farmer extension services, and agricultural statistics and monitoring. The experiences of Türkiye show the significance of strong institutions to enable technology adoption, enhanced farm management and broader sectoral modernization.

6.2.4 Development of Fisheries and Aquaculture

This is unfortunate given Somalia's 3,300 km coastline, yet its fishing industry is underdeveloped and underexploited. There are significant opportunities in fisheries and aquaculture for diversification of income and expansion of exports. Infrastructure for fisheries like cold chain, processing plants, and quality assurances systems and provision of training and support to artisanal fishers need to be the focus of Somalia as an investment. The rapid development of aquaculture in Türkiye, facilitated by government policies, processing and market investments, represents a good example of how Somalia could sustainably develop its marine resources, while also generating employment and food security.

6.2.5 Promotion of Climate-Resilient Agriculture

One of the biggest challenges facing Somalia's agricultural sector is climate variability. Climate-smart agriculture is critical for resilience in the long run. The promotion of drought resistant seed, improved water management, soil conservation and crop rotation system should be strengthened in Somalia. Such best practices from Türkiye national adaptation programs (like those on water-saving irrigation technologies and soil conservation) could be applicable by Somalia depending on its environmental and socio-economic context.

6.2.6 Balanced Use of Subsidies

While Agriculture subsidies can be helpful during transition poorly designed subsidies can promote market distortion and undermine sustainable productivity. Somalia has to ensure that any agricultural subsidies are targeted, time bound, and conditional upon clear performance indicators. What Türkiye teaches is that one-sided reliance on subsidies with the absence of parallel structural change which is supportive to the subsidies will cause non-environmentally friendly growth the same as sectoral growth. This is why Somalia should strive towards developing its subsidy policies in a manner that encourages innovation, eco-friendly practices and gradual rather than dependence by the farmers.

6.3 Limitations of the Study

Implications The study provides important information on the agricultural industry in Somalia and Türkiye, which according to the authors, has several limitations. The study is based on secondary sources of information entirely, such as global reports, national statistics or policy documents. As a result, the analysis relies on good quality and timely data, and is unable to use high-resolution data, especially in the case of Somalia where formal agricultural statistics capture is fragmented, uneven and not always representative.

As well, the study does not involve firsthand techniques of data collection like field surveys, interviews and case study. Include interviews with farmers, policymakers and industry participants in the field would have enhanced the results by providing more detailed and context specific feedback on constraints to production, market access and institutional barriers. Prospective research should seek to supplement analysis of textual sources by direct observation, in order to further develop a more holistic understanding of the constraints and advantages that face the agricultural sector in Somalia.

Not with the standing those limitations, the results of the current paper serve as a good basis for policy-making, sectoral investments and academic exchange about the agriculture based economic development in fragile and emerging countries.

6.4 Suggestions for Future Research

Prospects for the study may further be unfolded if this research is replicated to gather primary data at the community level. More detailed information on constraints to productivity, adaptation to climate change, gender roles in agriculture and value chain participation could offer provided via household and farm level surveys. These data would enable more focused and evidence-based policy advice that is appropriate for the specific context of the multitude of Somalia's agro-ecological zones.

Furthermore, comparative studies across a broader set of developing economies for example Ethiopia, Kenya, or Vietnam might provide more general lessons about what works with regard to agricultural transformation in different institutional and climatic environments. Longer term analysis of how digital technologies can be combined with climate-resilient farming innovations, supported by inclusive rural finance systems would also be of great value for the academic and policy discussions of the agricultural development pathways in fragile states such as Somalia.

To inform the way forward for Somalia in its pursuit of agricultural modernization, economic resilience, and sustainable rural development, we require a stronger empirical base from interdisciplinary, mixed-methods research.

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