Review Article

Current Situation, Challenges and opportunities of agriculture in Afghanistan

ABSTRACT

This paper provides a concise overview of the current situation, challenges, and opportunities in the agricultural sector of Afghanistan. From the importance of agriculture in the Afghan economy to the potential for growth and poverty reduction, it covers key aspects of the agricultural sector in the country. Despite facing challenges, Afghanistan has opportunities for growth, such as export potential, investment in irrigation, access to modern technology, private sector investment, and diverse agroecological zones. Investing in irrigation infrastructure, modern technology, and private sector involvement can significantly improve agricultural productivity and contribute to economic growth. The government plays a vital role in promoting agriculture through policies such as subsidies, research and development, and initiatives to boost productivity and access to finance.

Keywords: Agriculture, Challenges, Opportunities, Afghan agriculture

INTRODUCTION

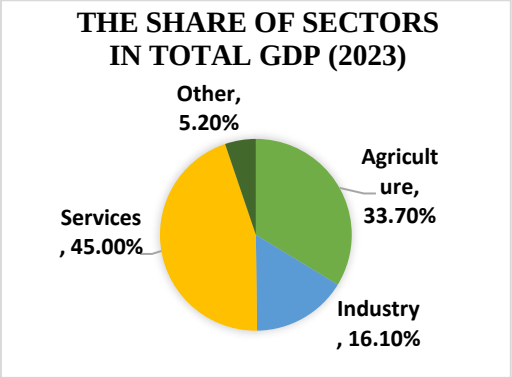
Agriculture, the only source of human nutrition, is the world's largest industry and significant land use, accounting for 40% of accessible land (Ramankutty *et al*. 2008). Agriculture has long dominated the Afghan economy and contributed significantly to its growth [16,17]. Approximately 70% of Afghans live and work in remote areas, largely on farms, and agriculture provides income to 61% of all households. Despite a fall in Afghanistan's entire economy, agriculture still employs 40% of the whole labor force, and more than half of Afghans residing in rural regions work in agriculture (World Bank, 2018).

Agriculture has a great potential for expansion and significantly impacts poverty reduction and employment creation both on and off the land. Afghanistan's agricultural goods rely nearly exclusively on melting snow and spring rains to supply irrigation water [18-20]. Maximizing agricultural growth needs more investment in the extension of irrigated land. Afghanistan is known for its produce, especially its almonds, pomegranates, pistachios, raisins, and apricots. Afghanistan is currently rebuilding its position in the global market (Muradi, 2018).

According to the National Statistics and Information Authority (NSIA) population statistics division, Afghanistan's population was estimated at 34.3 million in 2022–2023. According to estimated population graphs, there are 25% urban residents, 70% rural residents, and 5% Kochi (nomadic) people. The country's gross domestic product (GDP) was estimated to be Afs 1283 billion and Afs 37418 per person. In 2022–

2023, the real GDP growth rate was -6.2 percent. The GDP proportion of major sectors of Afghanistan is shown in the graph.1 (NSIA, 2023**).**

Graph. 1: The share of sectors in total GDP in 2023 (percentage)



The climate of Afghanistan:

Afghanistan experiences an arid continental climate with significant seasonal temperature and precipitation variances. Temperatures can vary widely by height, with mountainous regions seeing yearly temperatures far below zero and southern dry regions having temperatures well above 35^{o}C. Precipitation varies greatly depending on geography, with the southern dry region receiving fewer than 150 millimeters (mm) per year and the northeastern mountain range receiving more than 1,000 mm. The latter is linked to Afghanistan's drought circumstances. The minimum temperature is in January, while the maximum is in July, as illustrated in Figure 1. As well, the month with the least precipitation is September, while the month with the most is March (World Bank, 2020).

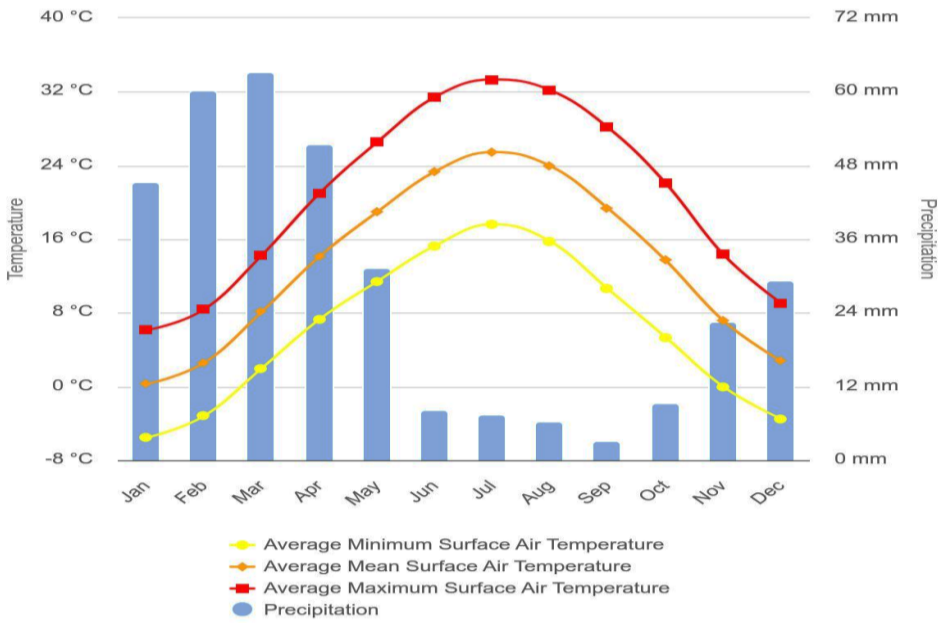
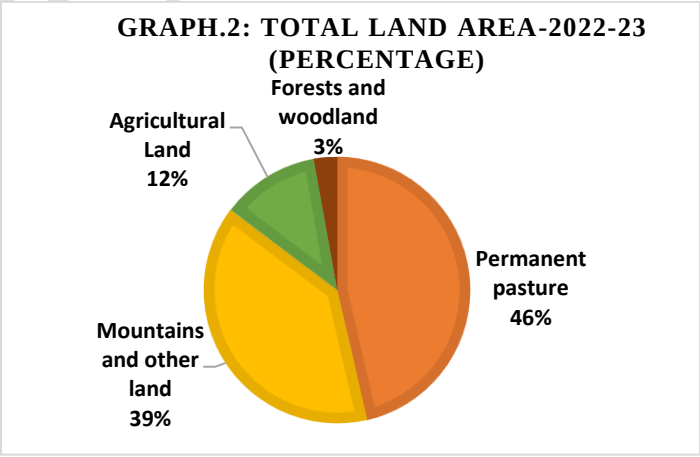


Figure. 1. Min-Temperature, Mean-Temperature, Max-Temperature, and Precipitation Monthly Climatology from 1991 to 2020. Source: https://climateknowledgeportal.worldbank.org/country/afghanistan/climate-data-historical

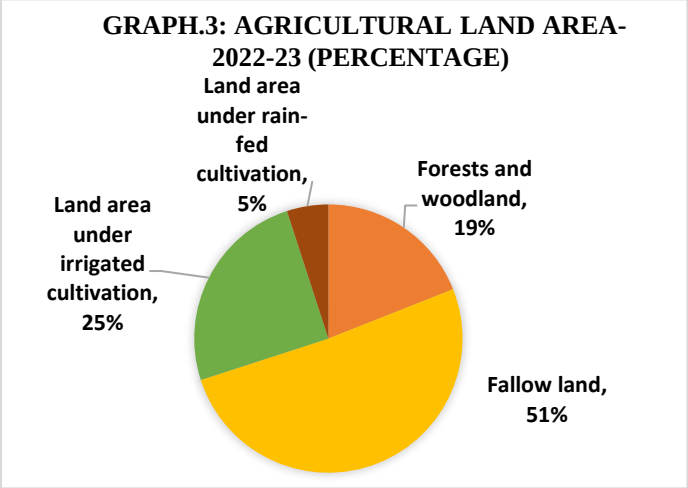
Land information

Afghanistan has a total land area of 65 million hectares, of which 85 percent is either mountainous or desert. There are only 1.8 million hectares of forests. 8 million hectares (ha), or 12 percent of the total land area, is agricultural land (graph 3). The north and west of the country contain the majority of the country's arable land. As shown in (graph 2) due to a shortage of water for irrigation, almost 50% of agricultural land is fallow or uncultivated (NSIA, 2023**)**

Graph. 2: Total Land Area-2022-23 (percentage)



Graph.3: Agricultural Land Area-2022-23 (percentage)



Water

Afghanistan's water flow is split among five river basins: Amu Darya (Panje Ama), Helmand, Kabul (Indus), Harirod-Morghab, and the Northern River Basin. Except for the Northern Basin, the four others are transboundary basins that flow into neighboring nations. During the spring, there is substantial runoff from the mountains into the Kunduz, Kabul, Helmand, and Harirod rivers, which can cause floods and landslides. Figure 2 shows the map of five river basins in Afghanistan (Karim et al., 2024; Habibi, 2014).

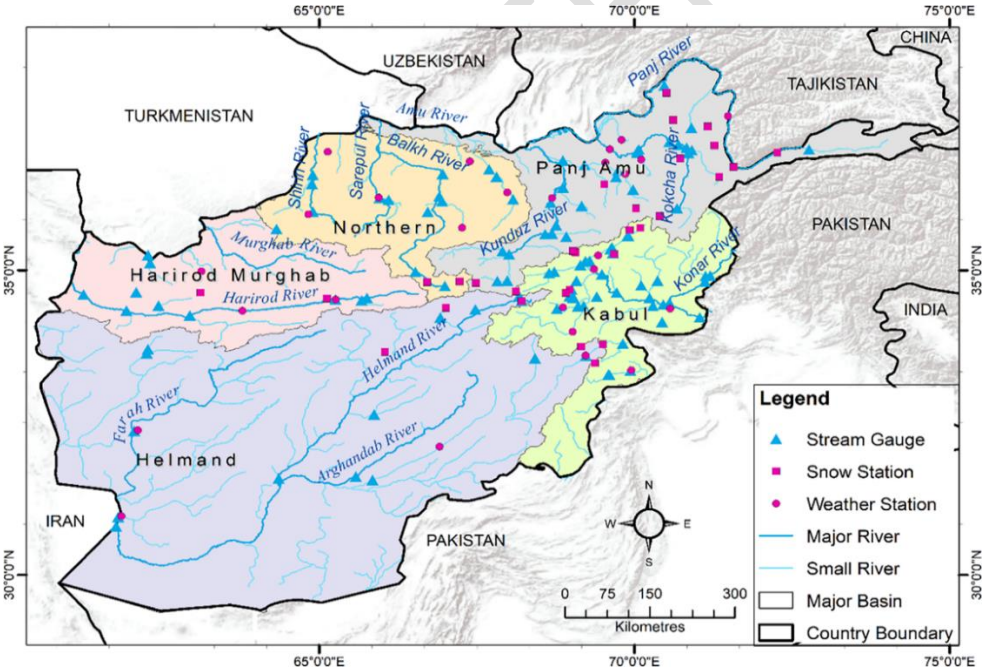


Figure 2. The map depicts river basins, drainage networks, and weather monitoring stations. (Karim et al., 2024)

The Government of Afghanistan has classified irrigation water into four categories based on its origin, which are: river and streams water accounts for 84.6%, Spring water for 7.9%, Karezes (kanats) for 7%, and

shallow and deep wells for 0.50%. Nearly all rivers in Afghanistan, along with the majority of the country's water supply, including water for drinking, irrigation, and surface and ground water, are fed by precipitation falling within the boundaries of Afghanistan and the annual melting of snow and glaciers in the mountains. In Afghanistan, the agricultural sector uses almost 93% of the country's total water supply. Afghanistan's total water resources are 75 (BCM/year), of which 57 is surface and 18 are groundwater. Afghanistan utilizes only 20 billion cubic meters of its whole potential water area (Habibi, 2014).

Despite their lesser basin area percentages (14% and 11%, respectively), the Panj-Amu and Kabul River basins generate the largest water quantities (38% and 35%, respectively) of Afghanistan's total outgoing flow. The other three basins have smaller volumes than predicted for their size, with 17% volume but 52% area for the Helmand River basin; 5.2% volume but 12% area for the Harrirud Murghab River basin; and 4.5% volume but 11% area for the Northern River basin (Mahmood, 2008; Bromand, 2015).

Major crops

Fruits

The climate of Afghanistan is favorable for almost all kinds of fruits. Fruits, viz., apple, pomegranate, apricot, mulberry, grape, almond, and other fruit trees are the main types of fruits in Afghanistan. In 2022-2023, the total area under cultivation for fruits was 351 thousand hectares. The grape area was 92600 hectares, with a total yield of 909.8 thousand tons. The total area planted with apples was 30163 hectares, with a total yield of 318.7 thousand tons. The total area of almonds was 36862, and the total area of apricots was 27082 hectares, with a total yield of 64256 and 207490 tons, respectively (NSIA, 2023). The positive factors for Afghan fruits are the region's climatic advantages, horticultural tradition, and international market reputation. However, challenges include small landholdings, poor orchard management, low yields, inadequate infrastructure, low quality standards, inadequate public services, and growing imports to meet higher standards (Masini and Giordani, 2016).

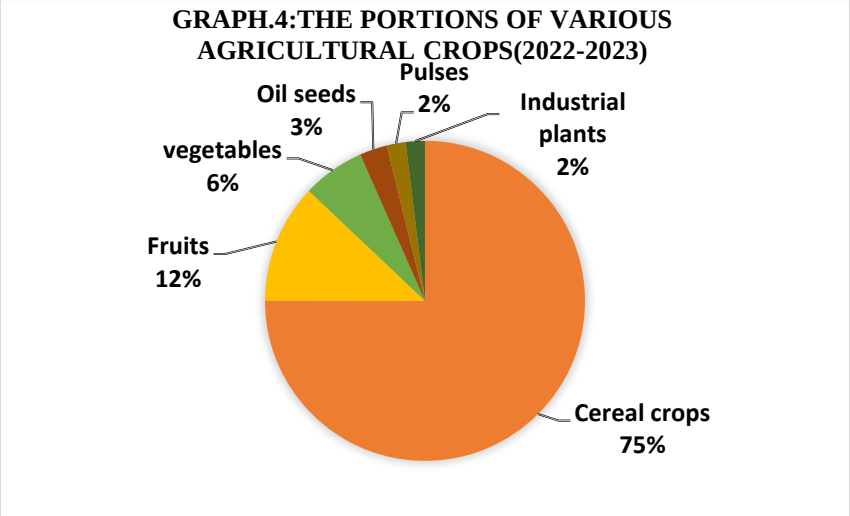
Vegetable

Vegetables are grown to meet the requirements of homes and markets. Potatoes and onions are prominent vegetables that are important to Afghan cuisine. In 2022-23, the total area under vegetable cultivation was 184 thousand hectares, of which the area under potato cultivation was 56.1 thousand hectares, accounting for 30% of the total area of vegetables with a production quantity of 889.4 thousand tons, and the production of potatoes per hectare was 15.9 tons. Onion farming covers 30.5 thousand hectares, and the yield has exceeded 541.2 thousand tons (NSIA, 2023). Some of the limitations of vegetable production in Afghanistan include a limited variety of vegetable types and a dearth of applied research to define cropping cycles, extend marketing opportunities, and determine the marketing season (Masini and Giordani, 2016).

Grain

Wheat is a key food crop grown on irrigated and rain-fed land every year. In 2022–23, the total land used for grain cultivation was 2.2 million hectares, with wheat accounting for 85 percent of the total. Wheat products in 2022–23were 3.8 million tons, with irrigated wheat accounting for 87 percent and rainfed wheat accounting for 13 percent. Helmand and Herat produce the most irrigated and rain-fed wheat. Rice output in each province was 0.4 million tons, with Kunduz province producing the most (126.6 thousand tons). Maize and barley were 0.3 and 0.09 million tons, respectively. (NSIA, 2023)

Graph.4: the portions of various agricultural crops (2022-2023)



Challenges

Afghanistan is an agricultural country, with over 80% of its population relying on agriculture for their livelihoods **(**Muradi and Boz, 2018**).** However, the sector faces several challenges that hinder its growth and development. Here are some of the challenges and opportunities of agriculture in Afghanistan:

Agriculture is the backbone of the Afghan economy, accounting for over one-third of the country's GDP and employing over half of its population. Despite its importance, the sector faces several challenges.

1. **lack of technical knowledge:** many farmers in Afghanistan lack the technical knowledge to improve their yields and achieve better results. This is because there are few opportunities for them to access training or education in agricultural techniques.
2. **Inadequate Agricultural Research and Extension Programs:** There are fewer possibilities to educate and train farmers to adopt new agricultural concepts and techniques that will increase agricultural output. Additional obstacles to agricultural growth in Afghanistan include concerns with the organization and management of research, education, and extension services. Agriculture in many districts of Afghanistan is poorly underdeveloped, due to strong constraints on the utilization of

knowledge and innovation for advancement goals (Saleem and Raouf, 2011). In 2001, the Afghan government and non-governmental organizations (NGOs) began developing projects to increase agricultural productivity across the nation. The NGOs played a major role in the execution of the extension program, while the Ministry of Agriculture functions mostly as a regulator (Kock *et al.* 2010).

3. **Security and political instability:** One of the primary challenges faced by the agriculture sector in Afghanistan is political instability and insecurity, which has resulted in a lack of access to markets and disruptions in the supply chain. The ongoing conflict in Afghanistan have made it difficult for farmers to access their land and markets. The insecurity has also led to the displacement of people, which has affected agricultural production. During the period of 2001–2021, the international community's assistance to the agriculture sector has led to significant development in this sector, but unfortunately, in August 2021, when the republican system collapsed, the international community reduced its assistance to Afghanistan.
4. **Water scarcity:** Afghanistan is a dry country, and water scarcity is a significant challenge for agriculture. The country relies heavily on irrigation, but the infrastructure is inadequate and the water supply is unreliable. Unfortunately, Afghanistan is unable to fully utilize its water potential. Lack of budget and a comprehensive strategic plan for water concerns, particularly integrated water resource management (IWRM), is a significant issue that the Afghan government must address (Habibi, 2014).
5. **Lack of modern technology:** Most farmers in Afghanistan still use traditional farming methods, which are inefficient and yield low productivity. The lack of modern technology and equipment has also hindered the growth of the sector.
6. **Poor infrastructure:** The poor state of roads, bridges, and other infrastructure has made it difficult for farmers to transport their produce to markets. This has led to high transportation costs and reduced profits.
7. **Postharvest losses:** pre- and post-harvest losses are a complicated issue in Afghanistan, and **they** provide an important challenge for farmers in general and fruit growers in particular. About 30% to 40% of agricultural productivity is lost due to inadequate management and producers' lack of understanding (Mirwais and Yamada, 2017).
8. **limited access to credit:** Another significant challenge for the agriculture sector in Afghanistan is the limited access to credit, which makes it difficult for farmers to invest in their businesses and expand their operations.
9. **Natural disasters**: Furthermore, the sector is vulnerable to natural disasters, such as droughts, floods, and pests, which can cause significant crop losses. Pests and diseases are among the factors that always affect agriculture, cause the destruction of cultivated areas, and decrease the production of agricultural products. Pests such as floods, grasshoppers, frosts, and hail have also occurred in Afghanistan every year, which have caused significant losses in the agriculture sector. On the other hand, major diseases such as rush, black spot, and plant aphids also affect the country's agriculture every year. It has caused a significant decrease in agricultural production. The prepared figures show

that in 2022, the crops of about 86 thousand hectares of agricultural land were completely destroyed by floods, and about 30 thousand hectares were partially destroyed throughout the country. Meanwhile, the crops of about 18,000 hectares of agricultural fields have been completely destroyed due to cold and hail, and about 103,000 hectares have been partially destroyed throughout the country. The outbreak of diseases also occurred in 2022. The figures show that approximately 3.5 thousand hectares of agricultural land have been completely destroyed, and about 34 thousand hectares have been partially destroyed by various diseases. In 2022, horticulture was also affected by pests and diseases. The obtained figures show that due to floods, cold, hail, and grasshoppers, the crops of about 15 thousand hectares of gardens have been completely destroyed, and about 1309 thousand hectares have been partially destroyed throughout the country. On the other hand, due to various diseases, the crops of about 1,000 hectares of gardens have been completely destroyed, and about 53,000 hectares of the country have been partially destroyed (MAIL, 2022).

Opportunities

Although agriculture in Afghanistan faces several challenges, there are also opportunities for growth and development. Addressing the challenges and investing in the sector can help improve the livelihoods of farmers and contribute to the country's economic growth.

1. **Export potential:** Afghanistan has the potential to become a regional exporter of agricultural products, given its strategic location connecting Central Asia, South Asia, and the Middle East. The country has a favorable climate for growing fruits and vegetables, which are in high demand in these markets. There is a growing demand for high-value crops such as saffron, almonds, and pomegranates, which have the potential to generate significant income for farmers.
2. **Investment in irrigation:** Investing in irrigation infrastructure can help increase agricultural productivity and reduce water scarcity. This will require significant investment, but it has the potential to transform the sector.
3. **Access to modern technology:** Providing farmers with access to modern technology and equipment can help increase productivity and efficiency. This will require investment in research, development, and training programs. Additionally, there is room for technological advancements, such as the use of modern irrigation techniques and the adoption of new seed varieties that are better suited to the country's climate.
4. **Private sector investment**: Increased investment from the private sector can help improve infrastructure and create jobs in rural areas, including in the agriculture sector.
5. **Diverse Agroecological Zones:** Afghanistan's varied climate and topography offer the potential to grow a wide range of crops, including fruits, vegetables, nuts, and grains, which can contribute to both food security and export opportunities. Afghanistan has the potential to diversify its agricultural production by growing crops such as saffron, almonds, and pistachios. These crops have high value in international markets and can provide farmers with higher incomes.

6. **Government policies:** the government can promote agriculture through policies such as subsidies, research and development, and initiatives to boost productivity and access to finance. With the appropriate mix of policies and investments, the agriculture sector can reduce poverty and enhance long-term growth in Afghanistan by creating employment, increasing productivity, and increasing inclusivity (World Bank, 2018). The government's responsibility is to strengthen research stations, which are critical in the creation of novel varieties to boost production, shelf life, and marketability. Field days and demonstration programs are essential for spreading new technologies among farmers. Farmers may become self-sufficient and more productive by upgrading irrigation systems and on-farm water management (Muradi, 2018).

CONCLUSION

In conclusion, by addressing challenges such as water scarcity, lack of modern technology, poor infrastructure, postharvest losses, limited access to credit, natural disasters, and security issues, and by capitalizing on opportunities like export potential, investment in irrigation, modern technology, and diverse agroecological zones for growth, Afghanistan can enhance its agriculture sector, improve livelihoods, and contribute to economic development.

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