



## Article

# The Efficiency and Development Assessment of the Agricultural Product Supply System for the Population

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**Abstract:** The article discusses the significance of efficiency and stability of the agricultural product supply globally and for Kashkadarya region, Uzbekistan. Theories of well-known economists are given to represent the importance of agriculture sector for all nations. Government reports, institutional websites, and scholarly articles are exposed to analyze the efficiency and development of the agricultural product supply system for the population of the region.

**Keywords:** Agricultural supply system, Food security, Sustainable development, harvest losses, Kashkadarya agriculture.

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## 1. Introduction

Along with the increase in population, the need for agricultural products, especially food products, is also increasing. Today, providing the population with high-quality and cheap agricultural products, which has become the most important issue in any developed country's rational socio-economic policy. Every year, the number of people living on earth will increase by more than 80 million, it is predicted that the world's population will reach 9.6 billion by 2050, and Sergiy Zorya, the leading agricultural economist of the World Bank, announced in his article that the efficiency of the production of agricultural products is low. Therefore, it is important to study the current state of supply of agricultural products.

As the world community faces the economic damage caused by the COVID-19 pandemic in 2019-2020, the role of agriculture and the need to carry out research on scientific and practical problems in this field has been proven once again. In particular, the role of agriculture is incomparable in countries like Uzbekistan, where a large part of the population lives in rural areas, prosperity and the main income of rural people is created in this area.

Since Uzbekistan is considered to be agro-industrial country, it has high potential to provide its population with necessary agricultural products and export to other foreign countries. The Uzbek government has recently managed a number of agricultural reforms with the goals of modernizing the industry, increasing the amount of output, and achieving sustainability. Many efforts have been made, for example, to

diversify agricultural production, move away from cotton-based economy and toward a wider range of high-value crops, and improve water resource management by using modern irrigation technology. The effectiveness of the agricultural product supply system is nevertheless hampered by issues like losses in harvest, inadequate storage facilities, disorganized supply chains, and climate change.

As in all other countries, the issues of agricultural development, productivity and quality improvement are of urgent importance for Uzbekistan. According to statistical data, the product created in the agricultural sector of Uzbekistan is 32% of GDP. Also, ensuring the development of the agricultural industry, which provides employment to 27% of the working population, was brought to the level of state policy. The Decree of the President of the Republic of Uzbekistan No. PF-36 of 02.16.2024 "On additional measures to ensure food safety in the Republic" can be cited as a clear proof of this.

In addition, the strategy of ensuring food safety and healthy nutrition of Uzbekistan until 2030 was approved by the presidential decree. Its main directions are:

- introduction of effective economic and environmental management systems for the use of natural, financial and material resources to ensure food safety and healthy nutrition and for all layers of the population to live a healthy and active life;
- creation of strategically important agricultural and food products and their raw materials reserves through mechanisms based on the principles of free market economy;
- in the process of ensuring food safety and healthy nutrition, to identify, assess, and management, as well as creating a notification and monitoring platform, etc. [6].

Projects such as "digital villages" in the Ferghana Valley in cooperation with the Food and Agriculture Organization of the United Nations (FAO) [8] show the focus on agriculture. FAO and IKARDA are cooperating on the sustainable development of agriculture in Uzbekistan [9]. These cooperatives can play a significant role in reducing the land degradation in the future.

Another reforms in Uzbek agricultural sector is launching the program for 2022-2023 "Usage of modern technologies and rapid processing of data in improving the reclamation of saline agricultural lands" by The Institute of Soil Science and Agrochemical Research under the Ministry of Agriculture of the Republic of Uzbekistan, in cooperation with the Ministry of Innovative Development. A mobile application was created on the basis of the practical project on creating a performance-oriented mobile application. [10]

To analyze and assess the current state of Uzbek agricultural sector and its production activities, the following sources are used:

The official website of the Statistical Agency under the President of Uzbekistan: <https://stat.uz/ru>

The official website of the Ministry of Agriculture of Uzbekistan: <https://agro.uz/ru>

Analytical platforms for Central Asian countries: <https://cabar.asia.ru>

The official website of the Food and Agriculture Organization (FAO): [www.fao.org](http://www.fao.org)

## 2. Materials and Methods

With an emphasis on the Kashkadarya region, this study uses a mixed-methods approach to evaluate the efficiency and improvement of Uzbekistan's agricultural product supply system. Research Methodology includes Data Collection and Analysis. Data are collected from government reports, institutional websites, and

scholarly

articles were analyzed to assess the efficiency and development of the agricultural product supply system for the population.

**Literature Review.** According to foreign scientists Z. Zakic and Z. Stojanovic, "agriculture is a field of production in which primary products from plant and animal sources are produced, cleaned or processed to meet specific human needs."

The definitions given to the field of agriculture by the representatives of the history of world economic doctrines, the founder of the Physiocrat doctrine, François Quesnet (1694-1774) and the English economist William Petty (1623-1686) are of historical importance. According to François Quesnet, the wealth of society is created in agriculture. Also, William Petty recognized that the source of wealth is land and labor, and put forward the opinion that "Labor is the father of wealth, and the land is its mother."

The Greek scientist Xenophon considered agriculture to be the most important branch of the national economy. "If agriculture develops," he writes, "other types of activity will also develop." If agriculture declines, all other industries on land and water will die with it."

Different problems and economic and social changes in the agricultural sector at different times and regions may lead to the development of other systems that support this sector. Along with the development of these systems, the development of the agricultural sector is also taking place. As an example of such a system, we can say, first of all, the development of infrastructure. V.F.Stukach, G.K.Saparova, G.T.Sultanova, S.A.Saginova [1] noted that the development of infrastructure occurs in parallel with the production of agricultural products. According to scientists, infrastructure development, such as transport networks, water supply, electricity supply and Internet access, and the creation of rural commerce or jobs, will accelerate development in this area.

Another factor that develops agriculture is the development of technology. Technological development, production of agricultural products and their quality, processing processes, and yield increase. Automation, smart-farming, temporary weather forecasting systems are seen as important experiments in the technological development of agriculture. Foreign scientists N.G.Pasyukova, A.S.Kukushkin [2] say that insufficient attention is paid to issues of technological development of the agricultural sector in ensuring food security in developing countries. From this point of view, they emphasize that the technological stimulation of this field will lead to many achievements in the field.

Another system that develops closely with the agricultural sector is the system of effective use of underground and surface resources. It consists of sustainable development of the economy". In addition, the World Bank and the FAO [3] organization believe that the most important element necessary for the development of the agricultural sector is state policy and investments. According to agrarian organizations, well-conducted policies, well-directed investments, subsidies, loans, and infrastructural projects can enable comprehensive development in the sector.

IPCC [4] reports named "*Special Report on Climate Change and Land*" are claiming that production and supply in agriculture are in thread due to climate change and environmental problems.

Furthermore, the market for farm management software is expected to develop significantly, with an estimated 11.2% annual growth rate through 2026, according to Mordor Intelligence's predictions. The potential advantages that farm management software may provide in terms of streamlining farm operations and boosting production are further shown by this growth trajectory, which also emphasizes the growing use of digital solutions in agriculture. [5]

According to P.B.R.Hazell, [7]. In order to reduce the poverty and provide economic growth, smallholder farms' activity and their significance should be taken into consideration. Smallholder farmers should be open to inputs like fertilizers, seeds, and technology to improve productivity.

### 3. Results

One of Uzbekistan's largest regions, Kashkadarya, has a lot of agricultural potential because of its rich soil, temperate climate, and plentiful labor pool. The region is a major producer of cotton, wheat, fruits, vegetables, and cattle goods, and it contributes significantly to the nation's agricultural output. The system for supplying agricultural products to Kashkadarya's people, however, confronts a number of difficulties despite its robust production base. These include supply chain inefficiencies, inadequate infrastructure, and outside influences like climate change

The total land fund of the Republic of Uzbekistan is 45 million hectares, 27.9 million hectares (62% of the total land fund) are allocated for agriculture, of which the total area of agricultural land in Kashkadarya region is 2,322,754 hectares. Cultivated area in the region is 362,871 hectares.

In the last two years, 200,000 hectares of cotton and grain areas were reduced and given to 670,000 citizens in order to ensure the employment of rural residents, reduce poverty and increase the volume of food production. As a result, about 2.2 million seasonal and permanent jobs were created, and an additional 3 million tons of products were produced.

According to the preliminary data of the Statistical Agency under the President, the total volume of agricultural, forestry and fishery products (services) in January-December 2023 is 426,264 billion. 411,594.6 billion soums, including agriculture and animal husbandry, hunting and other services provided to these sectors, forestry 10,399.5 billion soums. The fishing industry amounted to 4,269.9 billion soums.

The economic indicators of Kashkadarya region are changing to the positive side, it can also be seen in the indicators of the gross regional product. (Table 1).

**Table 1.**

**Share of agriculture in gross regional product in Kashkadarya region (2020-2023).**

Indicators	Unit of Measurement	2020 year	2021 year	2022 year	2023 (Compared to 2020)
<b>Gross Regional Product (GRP)</b>	Billion UZS	35,605.3	42,560.2	49,520.8	58,400.0 (+22,794.7)

<b>Agriculture</b>	Billion UZS	23,777.8	28,275.6	32,227.2	24,469.6 (+6,918)
<b>Share of Agriculture in GRP</b>	%	66.7	66.4	65	41.9 (-24.8)

From the table above, it can be seen that although Agriculture has seen the growing trend over the years 2020-2023, the share of Agriculture in gross regional product has witnessed a significant decline over these years at about -24.8%. These indicators can be another proof that the region is not using its full potential to increase the efficiency of agricultural activities.

The table provides a comprehensive overview of the efficiency and development trends in the agricultural product supply system in Kashqadaryo region from 2020 to 2024. The analysis of the indicators over these years is presented below Table 2. [11]

**Table 2**  
**Kashqadaryo Region Agricultural System Efficiency (2020-2024).**

Indicators	2020	2021	2022	2023	2024
<b>Agricultural Production (tons)</b>	850000.0	870000.0	890000.0	910000.0	930000.0
<b>Storage Capacity (tons)</b>	200000.0	210000.0	220000.0	230000.0	240000.0
<b>Post-Harvest Losses (%)</b>	15.0	14.5	14.0	13.5	13.0
<b>Irrigated Land Area (hectares)</b>	150000.0	152000.0	154000.0	156000.0	158000.0
<b>Use of Modern Technology (%)</b>	30.0	35.0	40.0	45.0	50.0
<b>Government Financial Support (billion UZS)</b>	500.0	520.0	540.0	560.0	580.0

<b>Population Served (millions)</b>	3.2	3.25	3.3	3.35	3.4
<b>Food Security Index (score)</b>	65.0	67.0	70.0	72.0	75.0

#### 4. Discussion

The agricultural production in Kashkadaryo region has shown stable growth over the analyzed period. Starting from 850,000 tons in 2020, it increased steadily to 930,000 tons by 2024. Owing to Technological advancements and government support, this growth has been achieved.

Agricultural product storage capacity has steadily grown, rising from 200,000 tons in 2020 to 240,000 tons in 2024. These numbers show that more investments and financial support by government or public-private partnership for storage facilities will be needed to match the future predicted amount of agricultural products.

Significant progress has been made in the agriculture industry between 2020 and 2024, demonstrating initiatives to increase food security, efficiency, and productivity. The decline in post-harvest losses from 15% to 13% is indicative of advancements in handling procedures, storage facilities, and the use of contemporary post-harvest technology, all of which are critical to improving food security and optimizing agricultural productivity. In a similar vein, the area under irrigation has grown from 150,000 hectares to 158,000 hectares, underscoring continuous efforts to enhance water management and maintain regional agricultural output.

The region's emphasis on modernization is shown by the notable increase in the usage of modern agricultural technologies, which went from 30% in 2020 to 50% in 2024. Water-saving methods, digital monitoring systems, and precision farming have probably helped to improve resource use and production efficiency. Growing government financial aid, which increased from 500 billion UZS to 580 billion UZS within the same time span, has helped to support these advancements. Farmers have been able to increase their production capabilities and adopt new technology thanks to these investments, which also include financing facilities and subsidies.

From 3.2 million in 2020 to 3.4 million in 2024, the agricultural supply chain currently provides services to a marginally bigger population, reflecting rising consumer demands and population expansion. To accommodate this increasing demand, it is still essential to maintain effective supply chains and distribution networks. Last but not least, the Food Security Index greatly improved, going from a score of 65 in 2020 to 75 in 2024. This development highlights how the region has successfully addressed issues related to food security through improved production, decreased losses, and improved systems for distribution and storage, all of which have been aided by government initiatives and infrastructure development.

In conclusion, the table shows that there has been an attempt to increase the harvest of agricultural products and there should be stable focus on infrastructure and innovations in agricultural sphere.

In spite of the advancements, post-harvest losses are still high (about 13% in 2024). Poor handling techniques, antiquated preservation technology, and insufficient storage facilities are the main causes of this. Furthermore, even while the use of contemporary technology is growing, it still falls short of international norms; by 2024, only 50% of them will be in use.



## 5. Conclusion

Speaking of the assessment of the agricultural production and its supply system in Kashkadarya region claims progress and serious challenges. It is undeniable fact that government support, technological use and diversification of agricultural products have brought a steady rise in agricultural products. As a matter of the fact, the Food Security Index shows an improvement, causing enhanced availability and accessibility of agricultural products.

Even with these developments, there are still many obstacles to overcome. Even if they have decreased, post-harvest losses still affect the supply chain, and inadequate infrastructure and antiquated logistical systems make it more difficult to get goods to markets on time.

To be able to achieve sustainable improvement, the region of Kashkadarya should put in investments for the modern storage facilities, irrigation system and transportation. Farmers can get motivation when financial support and incentives are shown by government. Also, public-private partnership should be fostered to enhance the system.

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