CENTRAL ASIAN JOURNAL OF INNOVATIONS ON TOURISM MANAGEMENT AND FINANCE

https://cajitmf.centralasianstudies.org/index.php/CAJITMF

Volume: 06 Issue: 04 | October 2025 ISSN: 2660-454X

Article

The Necessity of Logistics Mechanisms in Enhancing Agricultural Productivity and Their International Practices

Temurbek Abdirashidov Abdirashid Ugli[*1]

1. International Innovation University
* Correspondence: temur9869@gmail.com

Abstract: This article examines the role of the logistics system in enhancing agricultural efficiency and analyzes successful practices from international experience. Using the comparative analysis method, advanced logistics approaches in countries such as the Netherlands, the United States, Japan, and India have been studied, with their applicable aspects to the context of Uzbekistan highlighted. The findings indicate that the development of logistics infrastructure plays a crucial role in reducing product losses, increasing export potential, and ensuring food security. The author proposes practical recommendations for Uzbekistan, making the article a valuable scientific basis for improving the efficiency of agricultural production.

Citation: Abdirashid Ugli T. A. The Necessity of Logistics Mechanisms in Enhancing Agricultural Productivity and Their International Practices. Central Asian Journal of Innovations on Tourism Management and Finance 2025, 6(4), 1484-1489.

Received: 30th Jul 2025
Revised: 07th Aug 2025
Accepted: 21st Aug 2025
Published: 5th Sept 2025

Keywords: Agriculture, Logistics, Agrologistics, International Experience, Product Loss, Export, Efficiency, Logistics Infrastructure, Comparative Analysis

1. Introduction

In the contemporary global economic context, ensuring food security, improving public welfare, and promoting the rational use of resources have become priority directions of the agricultural sector [1]. In this regard, along with agricultural production, the integrated and efficient organization of processes such as storage, processing, transportation, and delivery to markets plays a critical role. This, in turn, necessitates the introduction and development of modern logistics systems [2].

Many developed and developing countries have thoroughly studied logistics approaches in agriculture and widely applied them in practice to enhance product efficiency, reduce post-harvest losses, and strengthen export potential. For instance, countries such as the Netherlands, the United States, Australia, and Japan have established effective models in agricultural logistics based on advanced technologies, digital monitoring systems, and collaborative infrastructure. Unfortunately, in some countries, including Uzbekistan—despite having significant agricultural potential—the underdevelopment of logistics systems prevents a portion of produced goods from reaching consumers in a timely and high-quality manner [3], [4].

From this perspective, the present article analyzes the impact of logistics on agricultural efficiency through the lens of international practice, explores advanced experiences, and examines the possibilities of their application in the context of Uzbekistan [5]. The main objective of the article is to analyze international practices in agricultural logistics and to develop recommendations for their implementation in national practice.

2. Materials and Methods

In addressing the research problem, a combination of traditional and modern methods of economic analysis was employed. In particular, the comparative analysis method was chosen to thoroughly examine the significance of logistics systems and mechanisms in improving agricultural efficiency. The rationale for selecting this method lies in its ability to identify effective models and approaches by comparing advanced practices in agricultural logistics across different countries.

Through comparative analysis, the experiences of countries with highly developed logistics systems (e.g., the Netherlands, the United States, Japan) and those with rapidly developing agricultural sectors (notably India, Brazil, and Turkey) were investigated. The analysis covered components such as logistics infrastructure, information technologies, organizational approaches, and state policies in the processes of delivering, storing, processing, and exporting agricultural products.

The research was based on the following sources:

- Reports of international organizations (FAO, OECD, World Bank);
- Scientific articles, strategic programs, and national development plans;
- Available statistical data and open databases (OpenAgriStats, World Bank Data);
- Practical case studies and up-to-date information from online sources.

The analysis enabled the selection of effective logistics practices with potential applicability in Uzbekistan, followed by the development of relevant recommendations. The choice of methodology also reflects the applied orientation of the topic, as this approach allows for harmonization of national practices with international standards.

3. Results and Discussion

The findings of the research and examination of existing practices demonstrate that improving the efficiency of agricultural products requires not only the establishment of logistics services but also the creation of a comprehensive logistics mechanism that operates in accordance with existing demands [6], [7].

The notion of a “mechanism” deserves special attention. Although its meaning varies across fields of application, its essential substance remains the same. In a general sense, a mechanism refers to the process or means that explains how a system functions, how its components are structured, and how these components interact in a coherent manner. Put simply, it represents the “internal mode of operation” of a system. This definition also implies its more specific meaning. For instance, in economics, the market mechanism consists of a set of methods by which economic processes are carried out and regulated—primarily through demand and supply, or prices [8].

Consequently, developing a modern logistics mechanism has become a necessity of the time, as it serves to increase the utility, profitability, and ultimately, the efficiency of agricultural products.

As shown in Figure 1, analytical data indicate that one of the main causes of agricultural product losses in the national economy is the insufficient development of a modern logistics mechanism in this sector [9].

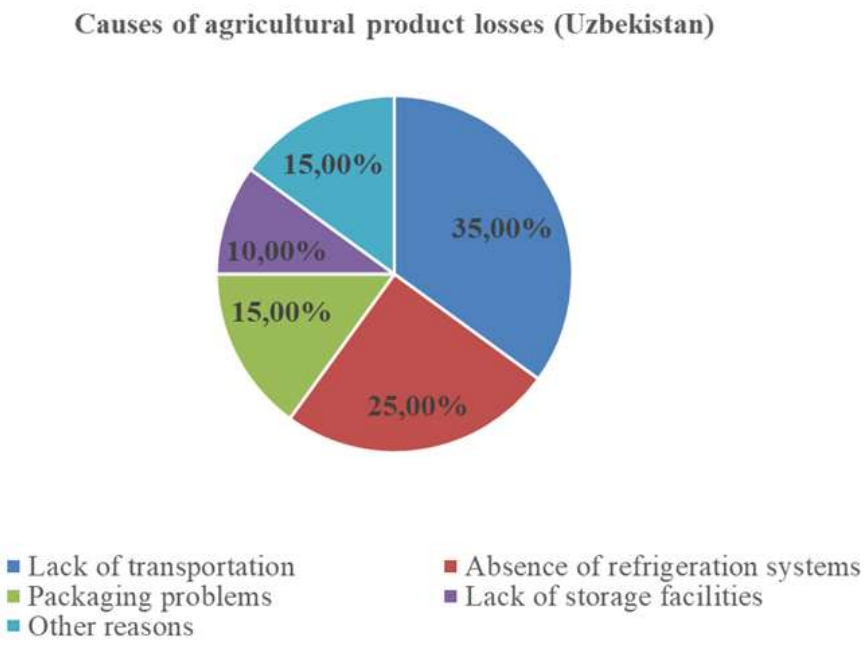

Figure 1. Village farm products loss of the reasons relative in the indicators analysis.

According to the results of the comparative analysis, the level of development of the logistics mechanism is a crucial factor in enhancing sectoral efficiency. The experience of developed countries demonstrates that a well-established logistics infrastructure—covering all stages from harvesting to processing, storage, and delivery to markets—significantly reduces product losses, preserves product quality, and increases farmers' income [10], [11].

From this perspective, the study of global practices in logistics mechanisms is strongly recommended.

Table 1 below presents the approaches adopted by selected developed countries in organizing agricultural logistics mechanisms, their impact on efficiency, and the comparative results with the practice of Uzbekistan.

Table 1. Developed in countries village farm logistics mechanism comparison comparative analysis.

Country	Logistics mechanism contents	Results	Suitable aspects for Uzbekistan
Netherlands	Digital 8logistic platforms, refrigerated storage systems, rapid transit network	Product loss <5%,export share high	Agrologistics centers and clusters organization to grow
USA	Automated warehouses, GPS-based cargo control, farmers cooperation	Logistics expenses decreased, competitiveness increased	Cooperations, logistics clusters and centers develop
Japan	"Smart" warehouses ,high technological storage and to deliver systems	Product quality stored, internal market stability provided	Products storage modern technologies current to grow

India	Regional logistics nodes, state private partnership based on infrastructure	Product waste decreased, market exit time shrunken	Regional center, logistics clusters and shipping their ways development
Uzbekistan	Enough at the level non-automated, refrigerated warehouses less, increase-decrease, transport transportation in the processes lack, slowness and others .	Product waste high, in export delays is observed.	Modern logistics mechanism create through village farm of products organizational, economic and synergistic efficiency increase

Based on the above analysis, the following main results were identified:

1. The centralization and digitalization of the logistics system significantly reduce product losses [12], [13].
2. Cooperation among farmers lowers logistics costs and facilitates access to larger markets.
3. Refrigerated and temperature-controlled storage infrastructure plays a vital role in maintaining product quality.
4. High-quality transportation and logistics routes ensure timely and cost-effective delivery of products to markets.
5. In Uzbekistan, the gradual adoption of global practices in these systems could substantially improve agricultural efficiency.

Based on these results, it can be emphasized that forming a logistics mechanism in the country's agriculture, which accounts not only for national but also international requirements, is among the essential conditions for enhancing product efficiency. In particular, an analysis of the export volume of agricultural products in Kashkadarya region—both in physical and monetary terms—indicates the region's strong agricultural potential. However, further improvements in efficiency require the establishment of an integrated modern logistics mechanism, which is considered an objective necessity [14].

Although the region produces and exports a considerable share of agricultural products, the scope of untapped opportunities remains wide. According to the data obtained from the Kashkadarya Regional Statistics Department, a total of 209,561 tons of melon crops were produced in 2024. However, the analysis shows that only 43,616.30 tons, or 20.8%, were exported, see Table 2, while the remaining share was directed to the domestic market and partly lost [15]. Reports by the FAO indicate that due to logistical shortcomings, 5–10% of products are wasted annually.

As evidenced by the data in Table 2, fruit, vegetable, and melon crops account for the largest share in both volume and proportion of sectoral products. For instance, in 2024, the total agricultural export volume of the region amounted to 123,780.4 tons with a value of 71,077.9 thousand USD. Of this, fruit, vegetable, and melon exports represented 123,503.7 tons, or 99.8%, while their value was 71,077.9 thousand USD, or 98.5%. These figures indicate the necessity of further improving the logistics mechanism within the sector.

Specifically, Table 2 shows that among fruit and melon exports, watermelon alone accounted for 40,498.7 tons in 2024, which is an increase of 38,442.8 tons compared to 2022, with the export value rising by 6,232.9 thousand USD. Therefore, in the future, the introduction of an advanced logistics mechanism in agricultural exports may allow the Kökdala district of the Kashkadarya region to obtain the status of a national brand under the "geographical indication" category.

According to FAO's Strategic Framework 2022–2031, aligned with the 2030 Agenda, the transition toward efficient, inclusive, resilient, and sustainable agri-food systems is aimed at increasing productivity, improving nutrition, fostering environmental sustainability, and enhancing livelihoods—ensuring that no one is left behind.

Table 2. Analysis of exported agricultural products by Kashkadarya region in 2022-2024.

Product name	2022		2023		2024	
	Volume (tons)	Value (thousand) US dollar)	Volume (tons)	Value (thousand) US dollar)	Volume (tons)	Value (thousand) US dollar)
1. Total, exports size	55 266.0	48,616.8	63,800.5	56,416.5	123780.4	71,077.9
From this :						
1. 1. Fruits and vegetables products	54 201.3	47,953.9	63,320.6	55,437.1	123503.7	70 263.8
This including, watermelon crops :						
Melon	2,678.0	1,338.6	2 150.2	978.8	2,995.4	1,262.5
Watermelon	2,055.9	398.8	12955.7	1 182.2	40498.7	6,631.7
Cucumber	288.5	150.5	527.5	236.3	122.2	96.9
1.2. Village farm other products	1 064,6	662,9	480,0	979,3	276,7	814,2

An analysis of global logistics practices reveals that in most developed countries achieving high efficiency in agriculture, the establishment of logistics mechanisms has gone hand in hand with well-structured logistics infrastructure, the widespread adoption of digital technologies, and the promotion of farmer cooperation within integrated systems and effective agro-clusters.

Our research indicates that the deliberate creation and implementation of logistics mechanisms to improve agricultural efficiency not only strengthen export potential but also enable a comprehensive assessment of their impact across the entire agricultural value chain—from production and storage to processing and domestic market delivery.

4. Conclusion

The research findings demonstrate that the logistics mechanism is one of the decisive factors in improving the efficiency of agricultural products. In both developed and developing economies, the agricultural supply chain—from production to final consumption—depends directly on the establishment and implementation of well-planned and digitalized logistics systems as integral mechanisms, resulting in significant economic and social benefits.

The comparative analysis highlights that logistics infrastructure based on digital technologies, the availability of refrigerated warehouses, rapid and efficient transportation

networks, and cooperation among farmers collectively contribute to reducing product losses, preserving quality, and enhancing both exports and competitiveness.

REFERENCES

[1] Q. X. Abdurakhmonov, "Village on the farm logistics system develop issues," Uzbekistan Agrarian Economy Journal, no. 4, pp. 45–50, 2021.

[2] A. K. Djurayev, "Agrologistika tarmoqlarini rivojlantirishning ustuvor yo‘nalishlari," Tashkent Moliya Instituti Ilmiy Axboroti, no. 2, pp. 31–36, 2022.

[3] I. V. Kuznetsov and A. N. Safronov, "Logistics in the agro-industrial complex: foreign experience and Russian realities," Agricultural Economics of Russia, no. 3, pp. 75–81, 2020.

[4] B. Karimov and S. Nurmatova, "Agricultural logistics and its role in food security in Uzbekistan," Journal of Agricultural Economics and Management, vol. 12, no. 1, pp. 14–20, 2020.

[5] P. Silva and R. Almeida, "The influence of supply chain management in agricultural productivity: A case study of Brazil," International Journal of Logistics Research and Applications, vol. 22, no. 3, pp. 267–282, 2019. doi: 10.1080/13675567.2018.1549372.

[6] S. S. Kamble, A. Gunasekaran, and S. A. Gawankar, "Smart logistics in agriculture: Challenges and opportunities," Technological Forecasting and Social Change, vol. 169, p. 120825, 2021. doi: 10.1016/j.techfore.2021.120825.

[7] Food and Agriculture Organization of the United Nations (FAO), Improving Agri-Food Supply Chains Through Smart Logistics. Rome, Italy: FAO, 2023. [Online]. Available: https://www.fao.org/3/cc4951en/cc4951en.pdf

[8] World Bank, Enabling the Business of Agriculture. Agriculture and Food Global Practice, 2022. [Online]. Available: https://eba.worldbank.org

[9] OECD, Agri-Food Supply Chains and Logistics: Efficiency and Sustainability. Paris, France: OECD Publishing, 2021. [Online]. Available: https://www.oecd.org/agriculture/food-supply-chains-logistics.pdf

[10] OpenAgriStats, Global Agri-Logistics Data Hub. 2023. [Online]. Available: https://www.openagristats.org

[11] Republic of Uzbekistan, "Village farm and food supply," Resolution of the President of Uzbekistan PQ–4550, Nov. 11, 2019. [Online]. Available: https://lex.uz/docs/4606421

[12] USAID Uzbekistan, Agrologistics and Cold Chain Development in Central Asia. Washington, DC, USA: USAID, 2021. [Online]. Available: https://www.usaid.gov/uzbekistan/agriculture

[13] G. J. Jumayeva, "International standards based on financial report indicators analysis scientific fundamentals," Green Economy and Development, 2025.

[14] J. G. Jurakulovna, "The necessity and distinctive characteristics of audit in the internal control system," Spanish Journal of Innovation and Integrity, 2024.

[15] J. G. Jurakulovna, "The necessity and theoretical basis of financial statement analysis in modern management," 2023.