

**OPPORTUNITIES FOR IMPROVING ORGANIZATIONAL
AND ECONOMIC MECHANISMS FOR MANAGING FRUIT
AND VEGETABLE CLUSTERS IN UZBEKISTAN**

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Abstract. *This article provides a systematic analysis of opportunities for improving the organizational and economic mechanisms of managing fruit and vegetable clusters in the Republic of Uzbekistan. The study identifies institutional, financial, logistical, and management challenges observed in cluster activities, and substantiates ways to increase efficiency through vertical integration, public-private partnerships, digital transformation, and the implementation of international standards. At the end of the article, practical proposals for modernizing cluster management mechanisms were developed.*

Keywords. *Agro-industrial cluster, fruit and vegetable production, vertical integration, value chain, export potential, institutional environment, digital transformation.*

In Uzbekistan's economy, agriculture, specifically the fruit and vegetable sector, accounts for 24.3-28.5% of GDP. Between 3.13 million and 4.2 million people are employed in agriculture, accounting for 25-28% of the country's total employment. In recent years, the state has been implementing systemic reforms to introduce a cluster approach, diversify exports, and expand modern agricultural technologies. In recent years, the state has been implementing systemic reforms to introduce a cluster approach, diversify exports, and expand

modern agricultural technologies. While only 2 agricultural clusters operated in 2017, their number reached 355 by 2024. As of 2024, clusters account for 55% of total agricultural production and more than 60% of exports. However, the management system of fruit and vegetable clusters is still organizationally fragmented, access to financial resources is limited, and logistics and standardization systems are insufficiently developed. In 2024, Uzbekistan exported 2 million tons of fruits and vegetables, earning \$1.5 billion. In January-December 2025, this figure reached 2,162.7 thousand tons and \$2.1 billion, representing a significant increase compared to 2024. Export volume increased by 31.2-43% in 2024. However, the management system of fruit and vegetable clusters is still organizational in nature, access to financial resources is limited, logistics and standardization systems are insufficiently provided, and the development of scientific and practical foundations for improving the organizational and economic mechanisms of cluster management is of urgent importance.

International experience, specifically the practices of countries such as the Netherlands, Turkey, Chile, and Spain, shows that the cluster model is capable of increasing resource efficiency in agriculture by 30–50%, and export levels by 2–3 times. In Uzbekistan, the institutional foundations of agricultural clusters were formed in 2019-2022, and today more than 200 clusters are operating. According to official statistics, fruit and vegetable exports reached 2.1 billion US dollars in 2025, but the processing level remains at around 25-28%.

Analyzing the production and export indicators of fruit and vegetable products, Uzbekistan produced 23-25 million tons of fruit and vegetable products in 2024. 72-85% of the harvested products are consumed in fresh form without processing or exported.

In January-December 2024, fruit and vegetable exports increased by 31.2% and amounted to \$1.55 billion. In January-October 2025, the export volume exceeded \$1.7 billion. But along with development, there are also problems. The following systemic problems are observed in the activities of clusters:

- functional fragmentation of management bodies and slow decision-making processes;
- uncertainty in contractual relations between farmers, processing enterprises, and exporters;
- lack of cooling, storage, and transport logistics (post-harvest losses account for 20-35%);
- slow adaptation to international quality standards (GLOBALG.A.P., ISO 22000, HACCP) and high certification costs;
- lack of widespread coverage of digital monitoring, planning, and transparent reporting systems.

Opportunities for improving the organizational and economic mechanisms of managing fruit and vegetable clusters

1. Institutional and legal mechanisms

- Adoption of a special law or a regulation of the Cabinet of Ministers that clearly defines the legal status, obligations and rights of clusters.
- Creating a coordinating platform between local authorities, research institutes, farmers' associations, and exporters by establishing regional cluster councils.
- Implementation of mechanisms for the construction and management of cluster infrastructure (water supply, energy, logistics centers) within the framework of public-private partnerships (PPP).

2. Financial and economic mechanisms

- Preferential loans, interest rate subsidies, and expansion of guarantee funds for export-oriented clusters;
- Establishment of price stability funds to protect against crop price fluctuations;
- Implementation of risk and investment insurance products in a mandatory or subsidized form for cluster members;
- Establishing a mechanism to cover up to 50-70% of international certification costs.

3. Digital and innovative opportunities

- Implementation of a traceability system for product origin based on blockchain technology;
- Automation of water, fertilizer, disease, and weather monitoring using IoT sensors, artificial intelligence, and AI-based software;
- Development of a unified digital cluster management platform ("AgroKlaster.uz"), ensuring the electronic maintenance of planning, reporting, financial monitoring, and export documentation.

Furthermore, the following can be recommended as ways to improve fruit and vegetable clusters. Strengthening vertical integration - ensuring full vertical integration in 70% of clusters by 2026, unifying the chain of seed production → agronomic services → cultivation → harvesting → processing → logistics → export under a single management framework. Training centers for cluster managers - retraining of 500-700 managers annually, implementation of effective management based on KPIs (key performance indicators), and conducting international certification programs for 80% of managers. The transparency and audit system consists of implementing an internal audit system in all clusters, clearly defining price, quality, volume, and

delivery deadlines in contracts with farmers, and achieving 100% coverage of the digital reporting system.

Based on the improvement of the above, it is advisable to make a number of offers. These offers are:

1. Establishment of the National Cluster Council: Establishment of the "National Council of Fruit and Vegetable Clusters" under the Ministry of Agriculture, with the activation of 3 working groups for export, standardization, and digital transformation.

2. Development of a unified digital platform: Develop a unified digital management and monitoring platform for clusters ("AgroKlaster.uz") and connect all 355 clusters by the end of 2026.

3. Expansion of the cold chain system: construction of 50-70 modern cooling and storage centers in 14 regions, providing them with loans worth \$150-200 million under state guarantee.

4. Expansion of processing capacities: commissioning 30-40 new processing enterprises in 2026-2028 and increasing the processing level from 15% to 40%.

5. Improving branding and marketing: allocating an annual budget of \$5-10 million to create the national brand "Uzbekistan Fresh" and participate in international exhibitions.

6. Adherence to gender and youth policy: 30% quota for women in cluster management, grant-based scholarship and training programs to attract young agronomists and IT specialists.

Based on the above, improving the organizational and economic management mechanisms of fruit and vegetable clusters in Uzbekistan will ensure the following results:

The **economic effect** is to increase export volumes from \$2.1 billion in 2025 to \$3.5-4.0 billion by 2030, increase the processing level from 15% to 40-50%, reduce post-harvest losses from 30-35% to 15-20%, and increase the share of agriculture in GDP from 28% to 35%.

Social effect - creating 200,000+ new jobs, increasing the income of the rural population by 40-50%, and increasing the employment of women and youth to 30-35%.

Institutional effect- obtaining official legal status for 100% of 355 clusters, conducting international certification for 60-70% of clusters, and implementing digital management systems in 80% of clusters. The research results show that institutional clarity, financial support, vertical integration, and the combination of digital transformation will remain capable of making clusters competitive in international markets.

LITERATURES

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