SPECIFIC FEATURES OF MANAGING THE ACTIVITIES AND RESOURCE USE EFFICIENCY OF FRUIT AND VEGETABLE AGRO-CLUSTERS

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https://doi.org/10.5281/zenodo.19280138

Abstract. The article highlights the scientific essence of clustering the agricultural sector in the modern stage of the global economy as a primary driver for ensuring innovative development and increasing the competitiveness of agricultural products. Furthermore, it elaborates on the strategic importance of the fruit and vegetable sector in the Republic of Uzbekistan, not only for ensuring food security but also for enhancing export potential.

Keywords: Agro-cluster, globalization, import-export, innovative activity, credit and banking relations, logistics, economic growth, infrastructure, agro-service.

Introduction. The Decree of the President of the Republic of Uzbekistan dated March 14, 2024, No. PF-48 "On measures for financial support of agricultural producers and improvement of the cluster system in the sector," and the Resolution dated November 10, 2023, No. PQ-366 "On measures to further improve the system of cultivation, storage, and processing of agricultural products and increase export potential," envisage the restructuring of relations between clusters and farms based on market principles.

Fruit and vegetable agro-clusters represent a complex economic system covering the entire chain "from seed to finished product." Managing the efficiency of resource utilization (land, water, capital, labor, and innovation) within this system requires a unique approach. The objective of this article is to reveal the scientific and practical aspects of increasing resource efficiency and management effectiveness within the cluster system.

The founder of the cluster concept, Harvard University professor Michael Porter, in his work *"The Competitive Advantage of Nations"* (1990), defines a cluster as a "geographic concentration of interconnected companies, specialized suppliers, and service providers in a particular field." In his view, the efficiency of resource use increases precisely due to this systemic cooperation and internal competition.

In the post-Soviet space, economists such as A.V. Petrikov, I.G. Ushachev, and V.V. Miloserdov have conducted extensive research on the clustering of agriculture.

In Uzbekistan, the scientific works of Academician Q.A. Choriev, and Professors N.S. Muratova, B.T. Salimov, A.Sh. Tashpulatov, and R.H. Ergashev hold particular significance regarding agrarian sector reforms and the cluster system.

Table 1. Similarities and Differences in Research Approaches

Direction	Foreign Approach (M. Porter and others)	Local Approach (Uzbekistan Scholars)
Main Emphasis	Global competitiveness and innovation.	Food security and export orientation.
Resource Management	Self-regulation through market instruments.	State support and preferential resource allocation.

Direction	Foreign Approach (M. Porter and others)	Local Approach (Uzbekistan Scholars)
Integration	Voluntary cooperation and free association.	Harmony of vertical and horizontal integration.

Main Part and Analysis

1. Analysis of the Resource Base of the Cluster System

Fruit and vegetable clusters are characterized by higher risks and seasonality compared to other sectors. The efficiency of resource utilization in this system can be expressed through the following indicators:

- Land Resources: Increasing productivity through the implementation of intensive agricultural technologies.
- Water Resources: Integration of drip irrigation and digital monitoring systems to optimize consumption.
- Financial Resources: The turnover rate of working capital and the payback period of investments.

2. Statistical Data and Trends

In recent years, the number of fruit and vegetable clusters in Uzbekistan and their share in the gross agricultural product have significantly increased. For instance, research indicates that the cost of products grown using the cluster method is 15-20% lower than those of individual smallholder farms (*dehqon* farms), while productivity is 25-30% higher.

Table 2. Number of Fruit and Vegetable Clusters in Uzbekistan and Their Share in Gross Product

Indicator Name	Before the Cluster System	Within the Cluster System	Growth Rate
Average yield (centner/ha)	180–220	280–350	145%
Water consumption (m^3/ha)	6000–7000	3500–4000	-40%
Export price ($/tonne)	450	850	188%

As shown in the table above, resource efficiency in the cluster system is reflected not only in quantity but also through quality and price (added value).

3. Specific Features of Management

The following "Triple Helix" system plays a crucial role in managing fruit and vegetable clusters:

1. Vertical Integration: A seamless connection between the producer, processor, and exporter.
2. Logistics Management: The implementation of a "Cold Chain" system, which reduces product waste from 30% to as low as 5%.
3. Marketing and Branding: Operating in foreign markets based on "Global G.A.P." and "Organic" standards.

Conclusion. The efficiency of fruit and vegetable agro-clusters depends directly on the quality of management and resource optimization. Research results indicate that the following are essential for effective management:

- Digitalization: Monitoring land and water resources through "Smart Agriculture" technologies.
- Innovative Infrastructure: Establishing research and development (R&D) centers and laboratories within the cluster.
- Public-Private Partnership: Improving preferential lending and subsidization mechanisms in resource supply.

In summary, agro-clusters are not merely associations of enterprises, but high-tech ecosystems that ensure maximum economic and social benefits from limited resources.

Managing resource efficiency in fruit and vegetable agro-clusters depends not only on technical factors (irrigation, machinery) but also on institutional factors (contractual relations, management quality). In the views of Uzbek scholars, the application of "innovation-resource-saving" models, taking into account local climatic and soil conditions, emerges as a priority direction.

The theoretical foundation for the development of fruit and vegetable agro-clusters relies on systems approach and dynamic equilibrium theories. A cluster is not just an economic entity, but an ecosystem that unites the interests of all participants in the agricultural sector (state, science, business, and farmers).

The sustainability of this system depends on:

1. Long-term institutional guarantees provided by the state;
2. The modernity of infrastructure (logistics centers, laboratories);

Full transition to international quality standards (Global G.A.P., HACCP)..

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