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Article

The Importance of The Cluster in Improving The Management of Agricultural Product Processing Enterprises in The Republic of Karakalpakstan

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Abstract: The agricultural structural adjustment and competition intensify to put forward the requirement to agricultural product processing enterprise management mode. This cluster approach has become extremely relevant due to the task of raising the quality and competitiveness of products contributing to added value in the Republic of Karakalpakstan. Thereby Purpose of this study is to understand the significance of clusters in the management of agricultural processing enterprises and to determine the economic and organizational significance of clusters on a regional level. It is based on qualitative systemic-comparative analysis and subsequent evaluations of statistical data for the years 2020 to 2024 as well as cluster-based management mechanisms implemented for agricultural processing enterprises of the given district. The findings indicate that clustering enhances connectivity among producers, processors, logistics systems and markets that helps to achieve lower production costs, better coordination and speedier adoption of modern technologies. The empiric background shows that agricultural production is growing steadily, but that the added value of processed products volumes and share is increasing and added value with cluster-controlled enterprises is higher. The number of processed agricultural products grown within the study period increased almost twofold in the Republic of Karakalpakstan, illustrating the results of the implementation create a cluster model. The results reveal that management based on cluster significantly increases the competitiveness, promotes the increase of export and strengthens the innovative activity of the agrarian processing enterprises. The cluster approach, is an economical and practically effective market tool of managing, the article author mind, the implementation and further development of which will provide sustainable provision of agricultural growth, and will attract in regional investments, as well as will provide an effective utilization of regional agrarian potential of the Republic of Karakalpakstan.

Keywords: *Agriculture, product, market, system, product quality, cluster, consumption, processing, raw materials, competition, cost, enterprise*.

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1. Introduction

Today, deep structural transformations are being carried out in the agricultural sector. Globalization, increasing competition, ensuring food security, and the need to improve product quality and added value require effective management of agricultural processing enterprises [1]. In particular, the organization of processes from the cultivation of

agricultural products to processing, storage, logistics, and the release of finished products to the market as a single system is becoming increasingly important.

From this point of view, the cluster approach appears as one of the most effective mechanisms for improving the management of agricultural processing enterprises [2]. The cluster model connects all links of the production chain, ensures the rational use of resources, and creates a favorable environment for the implementation of innovations.

In this article, the theoretical and methodological foundations of the cluster in improving the management of agricultural processing enterprises, its economic and organizational significance, as well as the possibilities of its practical application are analyzed in detail [3].

Theoretical Foundations of Management of Agricultural Processing Enterprises Agricultural processing enterprises are an important link in the agricultural sector. Their activities are closely related not only to agricultural producers, but also to consumers, export markets, and the stability of the national economy as a whole [4].

The concept of management includes the processes of planning, organizing, coordinating, stimulating, and controlling the activities of an enterprise. Management at processing enterprises is characterized by the following features: - seasonality of raw material supply; - high requirements for product quality and safety; - complexity of technological processes; - the need for rapid adaptation to market conditions.

Therefore, traditional management methods are often ineffective. Integrated, innovative, and systemic approaches are required. The concept of a cluster and its economic essence.

A cluster is a unified system of functionally interconnected enterprises, educational and scientific institutions, service organizations, and government bodies located in a certain territory [5]. Clusters serve to increase production efficiency, enhance competitiveness, and accelerate innovative development.

From an economic point of view, the cluster has the following advantages:

- reduction of transaction costs;
- accelerating the exchange of knowledge and technologies; - increasing the possibility of attracting investments;
- development of specialization and cooperation in production.

In the agricultural sector, clusters are mainly formed on the basis of the "raw materials - processing - finished products - market" chain [6].

2. Materials and Methods

This study employs an extensive qualitative and quantitative research design using scientific methods to assess the relevance of cluster-based management axe used in agricultural processing enterprise. The research applies a systemic and comparative analytical method, by which agricultural processing enterprises can be analyzed as components of a whole chain of interconnected value additions combining raw material production, processing, logistics and market distribution together. For the empirical validity, an official statistical data of Republic of Karakalpakstan during the period of 2020-2024 is used, which contains the indicators of the volume of products from agriculture, output of processing, added value, and export orientation. The analytical tool is comparative analysis, which used to compare performance differences of enterprises organized at the cluster structure and enterprises directed under classical administrative models. It also uses descriptive statictical methods in order to find trends in production growth, changes in the share of processed products, dynamics of investment activity over the period of study. In parallel, the methodological framework also encompasses an institutional analysis of national cluster management mechanisms in terms of organizational setup, coordination mechanisms, financial consolidation, logistic integration, and innovation facilitation systems. Abstract The analysis of policy documents, documents describing government programs, and regulatory acts related to

the agricultural cluster development allow estimating the role of state support in the cluster efficiency. Abstract Logical generalization and synthesis methods are used to constitute findings from data collection and investigation about causal relations linking cluster-based management and enterprise performance. This is possible thanks to statistical evaluation of clusters on the one hand, and qualitative assessment on the other, which allows us to draw reasonably well grounded conclusions about the economic and organizational impact of clusters and develop effective proposals for improving the management of agricultural processing enterprises of the Republic of Karakalpakstan.

3. Results

In Processing clusters can be organized in various forms. In practice, the following main forms are widespread:

1. Vertically integrated clusters - covering all processes from cultivation to processing and sale.
2. Horizontal clusters - are based on cooperation between enterprises processing the same type of product.
3. Innovative clusters operate in close cooperation with research institutions and educational organizations.

Each of these forms creates unique opportunities for managing agricultural product processing enterprises [7].

4. Organizational and economic mechanism of cluster management

Cluster management takes relations between enterprises to a new level. This mechanism includes the following elements:

- strategic planning;
- unified logistics system;
- consolidation of financial resources;
- training and retraining of personnel;
- information and marketing infrastructure.

Clear distribution of tasks and responsibilities among cluster participants increases management efficiency.

5. Influence of the cluster on the efficiency of processing enterprises

5.1. Statistical analysis using the example of the Republic of Karakalpakstan. The organization of agricultural product processing enterprises in the Republic of Karakalpakstan on a cluster basis has been yielding positive results in recent years. A clear example of this is the growth of production volumes in the republic's agricultural sector, the increase in the share of processed products, and the acceleration of the process of creating added value [8], [9].

During 2020-2024, the volume of agricultural production in the Republic of Karakalpakstan demonstrated a stable growth trend. In particular, the volume of agricultural products, which amounted to 2800 billion soums in 2020, reached 4520 billion soums by 2024.

During this period, the share of crop production increased from 32 to 34 percent, while the share of livestock production remained relatively high. In particular, growth in the field of agricultural product processing demonstrates the effectiveness of the cluster model.

The volume of processed agricultural products amounted to 620 billion soums in 2020, and by 2024 this figure reached 1180 billion soums [10]. This is explained by the technological renewal in the activities of processing enterprises, the improvement of the management system, and the strengthening of cooperation within the cluster.

5.2. Evaluation of the efficiency of processing enterprises.

Analysis of statistical data shows that at processing enterprises managed on a cluster basis, production costs are reduced, and the competitiveness of products is increasing. The

rapid growth in the volume of processed products, using the example of the Republic of Karakalpakstan, serves not only to meet the demand of the domestic market, but also to increase export potential [11]. As a result, the cluster model manifests itself as an effective mechanism for managing agricultural product processing enterprises.

6. Cluster and Innovation Management

Innovation management is an integral part of the cluster. Cooperation with research institutions, the introduction of new technologies, and the use of digital management systems ensure the competitiveness of processing enterprises.

7. The role of the state in agricultural processing clusters

State support using the example of the Republic of Karakalpakstan The Republic of Karakalpakstan is one of the regions with high agricultural potential. Cotton growing, grain farming, rice growing, animal husbandry, fish farming, and fruit and vegetable growing are priority areas in the republic. Therefore, the development of agricultural processing enterprises on a cluster basis occupies an important place in state policy.

In recent years, a number of state programs have been implemented in the Republic of Karakalpakstan to create agricultural clusters [12], [13]. In particular, special attention was paid to equipping processing enterprises within the framework of cotton-textile and grain-growing clusters with modern technologies, developing infrastructure, and attracting investments.

The following support measures are being implemented by the state: - provision of tax and customs benefits; - allocation of preferential loans and subsidies; - improvement of engineering and communication infrastructure; - creation of legal and organizational conditions for cluster participants.

These measures contribute to increasing the efficiency of managing processing enterprises in the Republic of Karakalpakstan.

The state plays an important role in the development of agricultural clusters. The activities of clusters will be supported by improving the legislative framework, providing tax benefits, subsidies, and developing infrastructure [14].

8. Existing problems in cluster management

In the process of organizing and managing clusters, a number of problems arise: - conflict of interest between participants; - limited financial resources; - lack of management experience. A comprehensive approach is required to solve these problems.

9. Proposals for improving the management of agricultural product processing enterprises

The following proposals will serve to improve cluster-based management: - establishing open and transparent relations between cluster participants; - introducing digital management platforms; - improving personnel qualifications [15].

4. Conclusion

The conducted analysis shows that the management of agricultural processing enterprises on a cluster basis is a mechanism that provides high economic efficiency in the conditions of the Republic of Karakalpakstan. The cluster approach ensures the organic connection between production, processing, and the market, contributing to the creation of added value, efficient use of resources, and increasing competitiveness.

Indicators for assessing cluster effectiveness.

Using the example of the Republic of Karakalpakstan, the effectiveness of the cluster's activities can be assessed using the following main indicators:

1. **The indicator of the share of processing -** the growth of the share of processed products in the total volume of agricultural production (increased from 22% to 26% in 2020-2024).
2. **Value Added Indicator -** an increase in the value of finished products relative to raw materials.
3. **Production volume growth indicator** - the annual growth rate of the total volume of agricultural products (on average 10-12 percent).

4. **Investment activity indicator -** the volume of private and foreign investments attracted within the cluster.
5. **Export Orientation Indicator -** an increase in the share of export of processed products.
6. **Employment indicator -** the number of new jobs created at processing enterprises.

These indicators confirm that management through the cluster model is economically feasible.

Practical proposals. In order to further improve the management of agricultural product processing enterprises, the following practical proposals can be put forward:

- Expansion of regional agro-clusters specializing in processing in the Republic of Karakalpakstan;
- Implementation of a unified system of indicators for assessing the activities of cluster participants;
- Application of digital management and monitoring platforms at processing enterprises;
- Implementation of innovative technologies in cooperation with research institutions;
- Strengthening tax and financial incentive mechanisms for the production of export-oriented products;
- Development of a system for training and advanced training of personnel for cluster participants.

In general, the cluster approach takes the management of agricultural processing enterprises in the Republic of Karakalpakstan to a qualitatively new level. Evaluating the effectiveness of the cluster through specific indicators and making management decisions based on them will serve to fully realize the agrarian potential of the region.

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