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The Concept of a Regional Grain Production Cluster Ensuring Food Security

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Abstract. The article is focused on the challenges of creating a regional grain production cluster to ensure the food security at the regional and national levels. The research substantiates the conceptual scheme of building a regional grain product cluster summarizing the theoretical aspects of agro-industrial cluster formation and operation in the regional agri-food sector, as well as critically revises the prospects for their further development based on the food security implementation. The integration-driven transformation of the enterprises of agro-industrial complex based on the created clusters is an alternative to the crisis processes in the regional agri-food industry which cause considerable economic loss and deteriorating the living conditions of the rural population. That is why the ways searching how to optimize the regional grain product cluster structure require a clear definition of the national economy and enterprises branches participating in final product making. The agricultural enterprises specialized in growing, storing and processing grain products should constitute the regional grain production cluster core. The regional grain production cluster is an innovative development mechanism of the agrarian economy contributing to the country's food security.

1. Introduction

In a competitive market, the sustainable development of the agrarian sector is only possible in the conditions of close economic interaction between all subjects of the agro-industrial market, which causes the need to strengthen and deepen the integration-driven transformation of the enterprises of the agro-industrial complex (AIC). Clusters are a form of such transformation. Agri-food clusters can become one of the tools for creating high-performance production facilities to ensure food supply as well as sustainable development of the agri-food sector in the regions. The formation of growth points and multiplier sectors in the region generates the momentum needed for the economic development and provides the solution to social and environmental problems.

Cluster organization of business entities has already demonstrated its significant advantages that manifest in increasing competitive ability and sustainable competitiveness of regional enterprises, enhanced cooperation and competition between organizations. In modern conditions, the system of economic organization based on production clustering to a certain extent is able to compensate the lack of government support and mobilize such a microeconomic factor as resources. Consequently, the cluster form of integration-driven transformation is relevant for enterprises of the regional agro-industrial sector.



2. Basic material

The term "cluster" was introduced as an economic category by foreign scientists. In particular, the founder of the cluster approach is Michael Porter. He defines a cluster as a group of interconnected, geographically adjacent companies and organizations operating in a certain area and complementary to each other [1].

2.1. Definition of the cluster

A cluster, first of all, ensures the joint efforts of enterprises, governing bodies, subjects of investment and innovation activities in a certain territory. Competitive advantage is achieved through the introduction of innovation and rational organization of supply, production and marketing, implementation of adaptive policies, especially relevant in the conditions of modern rapidly changing market. Another specific result of the clustering is its positive synergetic effect, since, in accordance with the emergence principle, the growing integration creates new entrepreneurial properties that only exist when the organizations work jointly. As a result, their overall competitiveness increases and sustainable development is ensured [2].

According to Migranyan, the cluster as a concentration of the most effective and interrelated economic activities, i.e. a set of interrelated groups of successfully competing firms that form the "golden section" ... of the entire state economic system and provide competitive positions in the sectoral, national and international markets" [3].

American researcher Enright, while developing the Porter's theory, emphasized the fact that a cluster is comprised of geographically closely located enterprises. Enright created a theory of regional clustering, defining a regional cluster as an industrial cluster in which member firms are in close proximity to each other" [4]. Based on the Enright's theory, it is possible to conclude that the competitive advantages of clusters are formed not at the national level, as stated by Porter, but at the regional level. The main prerequisites for cluster creation are the common historical development of regions, their business culture, production and education. It is regional clusters that require targeted support of government structures and research organizations.

2.2. Three broad definitions of clusters

Considering the cluster theory of economic development, Tsihan outlines three broad definitions of clusters, each of which emphasizes the main feature of its functioning:

1) Regional forms of economic activity within related sectors, usually linked to certain scientific institutions (research institutes, universities, etc.);

2) Vertical production chains, rather narrowly defined sectors where the adjacent stages of the production process build up the cluster core. This category also includes the networks formed around parent companies;

3) Industries identified at a high level of aggregation (for example, a "chemical cluster") or a number of sectors at an even higher level of aggregation (for example, an "agro-industrial cluster") [5]. Thus, according to Tsihan, the cluster is a regional association of enterprises with a core, and the highest level of aggregation is in the agro-industrial sphere.

Maksimova associates the formation of agro-industrial clusters in the economy of the Russian Federation with agricultural zoning and specialization of economic activity in the agrarian sphere, determined by the quality of land resources and natural-climatic factors [6].

In her opinion, in the specific conditions of the Russian economy, high-tech agricultural holdings can become centers for the formation of agro-industrial clusters. In the long term, this model will ensure the national food security based on maintaining the economic diversity and historically established traditions, customs, methods and experience in agrarian management. The agro-industrial cluster should represent an integrated structure aimed at achieving a simultaneous and interrelated solution to the problems of industry innovative development, environmental protection and introduction of innovative technologies for further promotion of agricultural production. [6]

3. Results of the research

The main objectives of the AIC enterprises are focused on ensuring food security and maximizing the satisfaction of food demand. To achieve these objectives, a regional agri-food cluster will be established in the agro-industrial complex, since the goal of its creation is to increase the gross regional product and supply the population of the region with quality food products, optimize the spatial organization of agrarian and industrial territories by stimulating the development of rural areas, increase competitiveness of agricultural producers and food-producing enterprises, develop small and medium-sized enterprises in the agricultural sector, overcome industry and corporate limitations and form a unified added-value chain based on the "from field to counter" principle [9, 10].

3.1. Multi-level system of agri-food cluster

The agri-food cluster should be considered as a multi-level system of different interconnected organizations integrated with the aim of solving common challenges to meet the growing needs of the population for quality food products in accordance with the scientifically proven norms. Such association should be implemented in the form of a sustainable territorial and sectoral partnership of enterprises engaged in production, storage, processing and marketing of the major crop and livestock products that have a shared program of innovative development to achieve higher economic results from their joint activities.

The traditional organization of the agro-industrial complex functions in such a way that the major profits is generated by enterprises engaged in the production and sale of the final products, which leads to a violation of the principle of the economic performance equivalence in the whole chain from agricultural production to the sale of food products. As Savchenko T.V. notes, the market reform of the AIC led to its deformation as a unified balanced system and caused "the destruction of the system of economic relations, the growth of monopoly of processing and service enterprises and greater price disparity, which resulted in a sharp decline in the efficiency and sustainability of rural commodity producers" [11].

Cluster organization, through the use of forward and backward linkages, creates a mechanism of relations that allows eliminating the existing price disparity. Backward linkages make it possible to redistribute profits from sales for the production and processing of raw materials according to the incurred expenses. This is one of the main advantages of uniting enterprises into a cluster and the parity of interests of all participants in the association is achieved [12].

3.2 Factors that determine the advantages of creating an agri-food cluster

Analyzing the publications of various authors makes it possible to identify the main factors that determine the advantages of creating an agri-food cluster. These include:

- 1) Optimization of the technological chain of product promotion from the production of raw materials to final consumption;
- 2) Cost saving and achieving optimal production costs at all stages;
- 3) Increasing competitiveness and ensuring sustainable sales;
- 4) Strategic redistribution of available resources and introduction of innovation;
- 5) Growing interest of all participants in achieving the final economic result;
- 6) Making sure the production is safe for the environment and the population. [13, 14, 15, 16, 17].

Clustering, unlike other traditional forms of integration and cooperation, assumes the existence of a cluster core that ensures connections between its members and determines long-term production and sales, investment, innovation and other strategies. The cluster core can be represented by a large leader organization or a complex of enterprises (cluster-forming unit). It is reasonable to build a regional agri-food cluster around existing large food enterprises and producers of corresponding raw materials. Economic benefits are achieved through optimizing the investment of funds in the production of new products and the development of raw materials.

Clusters in the agri-food sector are a complex system of interrelated enterprises with many stages of production and processing of agricultural products. The quality and production costs of the final

products essentially depend on the previous stages of its processing. For the effective functioning of the agri-food cluster, it is necessary to establish a unified technological chain of product promotion to the ultimate consumer. This function is performed by transport, logistics, marketing companies. In addition, the association should include enterprises specialized in innovation and financial infrastructure, scientific and educational institutions, as well as government bodies.

The Russian Federation Food Security Doctrine determines that "The country's economic development stability calls for implementation of state regulation actions in order to overcome: ...price disproportions at farm, fish, raw material and food markets on the one hand and markets of material and technical resources on the other hand." [14] But price disproportions are inherent in the agricultural market itself, and building a regional agri-food cluster will help to eliminate them.

3.3. The Russian Federation basis of agri-food sphere

The basis of agri-food sphere at all stages of the development of agriculture in the Russian Federation has been the Grain Production Subcomplex. Therefore, we will review a conceptual scheme of a regional agri-food cluster based on the example of a grain production subcomplex.

Identifying the grain production subcomplex in the agro-industrial complex, Amirova proposes to consider its territorial (regional) structure, which includes an aggregate of relevant industries within the given territory [15].

The successful activity of the grain products cluster is ensured by the level of interaction between grain-producing enterprises and other enterprises of social production. Therefore, the search for ways to optimize the structure of the regional grain products cluster requires a clear definition of the involved sectors of the national economy and enterprises involved in creating the final product. The core of the regional grain products cluster should be represented by agricultural enterprises engaged in the cultivation of grain products, as well as providing for its storage and processing (on-farm grain storage facilities, elevators, bread-baking complexes, flour mills, feed factories and bread bakery plants, confectionery and pasta factories) [16].

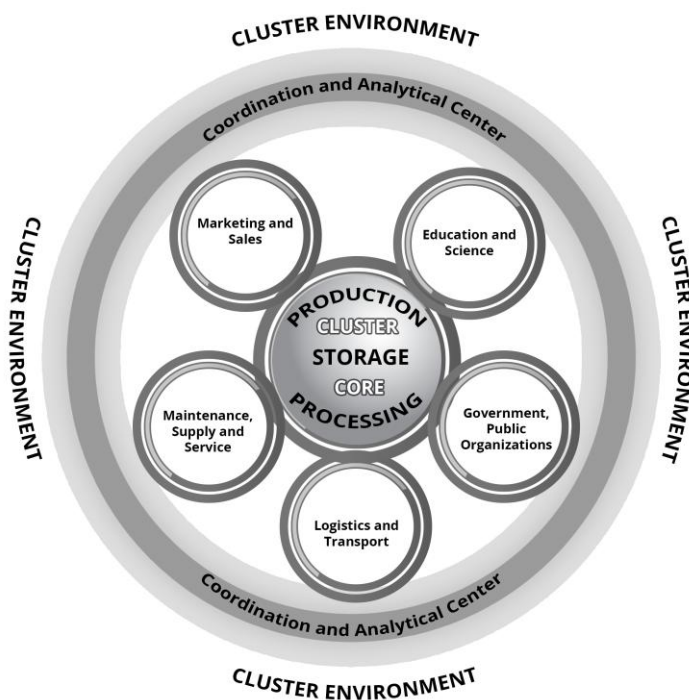


Figure 1. Formation of the core of a grain cluster.

Enterprises of cluster infrastructure (e.g. transport (logistics), maintenance, supply and service, marketing and sales, education and science) are formed around the core of a grain production cluster. To unite all of them into one well-functioning mechanism is the objective of the management and coordination enterprises responsible for the entire cluster (cluster coordination council, public authorities, public organizations and associations). Everything else, to some extent, constitutes the external environment of the regional grain production cluster (Figure 1).

4. Conclusions

Integration-driven transformation of the AIC enterprises based on clustering is an alternative solution to the crisis processes in the regional agri-food sector which cause a significant loss of economic potential and a decline in the living conditions of the rural population. The formation of a regional grain production cluster is an innovative mechanism for the development of the agrarian economy.

The result of clustering is to obtain a positive synergistic effect, which is due to the transfer of knowledge, increment in cash flow through joint cash flows from the companies sharing infrastructure facilities and reducing transaction costs. Thus, the creation of a regional grain production cluster contributes to the stable socio-economic development of its agro-industrial member organizations, which, on the whole, ensures food security of the region and the entire state.

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