Increasing the competitiveness of agricultural enterprises based on a cluster strategy

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Abstract. The article discloses, systematizes and supplements the fundamentals of managing the competitiveness of agricultural enterprises integrated into clusters, as well as the cluster structures themselves, considering the current provisions of economic theory and the theory of managing large socio-economic systems, and using the appropriate methodology. Approaches to managing the competitiveness of agricultural enterprises included in clusters using competitive strategies are discussed. The organizational and economic mechanism of creating an agrarian cluster is shown in order to increase the competitiveness of not only enterprises, but also the cluster as a whole, considering external and internal backbone factors. The strategy for increasing the competitiveness of agricultural clusters considers the concept of ‘competitiveness of an agricultural cluster’ as its basic characteristic that is formed from intra-cluster mechanisms of cooperation and interaction of cluster enterprises, which reflects the ability of participants to generate innovative technologies, produce new competitive products and promote them to target markets, including global ones, and, thus, maintain and increase competitive advantages in the field of specialization of the agricultural cluster. The article presents a technique for assessing the achievement of target benchmarks of the strategy for increasing the competitiveness of an agricultural cluster taking into consideration the competitive potential of cluster member enterprises along with the definition of the set of cluster effects obtained.

1. Problem definition

Increasing the competitiveness of domestic enterprises in the agricultural sector of the economy comes to the fore against the backdrop of difficult foreign economic relations caused by the sanctions impact on the economy of the Russian Federation and a general slowdown in economic growth.

The current stage of the domestic economy development raises the question of the need to move to the development of high-tech markets and goods with a high added value, including that in the agricultural sector, and to reduce the share of the raw materials segment in exports [1, 2]. In this regard, the industry faced new challenges: upgrading of production; development of innovative activities; introduction of the latest scientific achievements and advanced experience; which led to the analysis of
tools for regulating economic relations and the emergence of new measures and means of state regulation and support [3, 4].

A new understanding of the agrarian policy development vector by way of organizing new institutions and building economic relations on a fundamentally new basis has been formed. The Strategy for Scientific and Technological Development of the Russian Federation identifies major challenges that are urgent for the country, that is to say, problems, threats and opportunities that require an objective response from the state and new priorities for the country’s scientific and technological development. It defines, as priorities for the next 10 to 15 years to come, the areas of scientific and technological development of the Russian Federation, which will allow obtaining scientific, and scientific and technical results and create technologies that are the basis for the innovative development of the domestic market for products and services and ensure Russia’s stable position in foreign markets. The State Program for the Development of Agriculture and Regulation of Markets for Agricultural Products, Raw Materials and Food for the Period of 2013–2020, the Federal Scientific and Technical Program for the Development of Agriculture for 2017–2025, as well as the Doctrine of Food Security were adopted. However, the mechanisms of agricultural production management used in the framework of development programs are aimed at solving individual local problems and turn out to be insufficiently effective [5, 6].

In this regard, the aforementioned problems of agricultural production, the lack of effective tools and scientific methods to ensure the competitiveness of enterprises and inattention to the issues of restructuring and updating of the most production sub-sectors lead to low efficiency of agricultural production [7]. It is necessary to develop a mechanism for increasing the competitiveness of agricultural enterprises. It is obvious that the factor of competition is becoming decisive for ensuring the sustainable development of agricultural enterprises, and the instrument for achieving this goal is just the cluster approach, which is widespread in developed countries.

2. Purpose of the research
The purpose of the research is to analyze and summarize the activities for organizing clusters and to develop scientific recommendations for assessing and developing the competitiveness of agricultural clusters using cluster competitive strategies.

3. Research results and discussion
A cluster is one of the forms of interaction between organizations, entrepreneurs and social groups within the framework of a joint regional value chain. Such an interconnected group of business entities forms process chains in one or related industries; such chains increase the efficiency of individual participants through concentration and cooperation, and individual competencies of the participants create a more functional organization.

The scientific literature provides data on the analysis of the sectoral cluster development experience, the organization and development of institutions that implement the policy of cluster development, aspects of intra-cluster interaction of enterprises, the effectiveness of the implementation of initiatives for cluster development of territories, and other aspects [8, 9, 10]. For example, Marian Garcia Martinez reviews the role of partners and networks in open innovation, with collaboration, co-creation of value with consumers, the effectiveness of cluster organizations and the importance of network knowledge [11].

The Russian Federation has been implementing cluster initiatives since the 2000s. Agricultural enterprises of this country have been receiving support within the framework of the first cluster-oriented program of the Ministry of Economic Development of the Russian Federation since 2012.

It is believed that the development of clusters is not just a support tool, but a systematic approach to stimulating innovative development in the regions through:

- Interactions between manufacturers of different sizes, between business, science and education, between existing businesses and the infrastructure that fosters new firms
• Increasing the efficiency of spending budget funds by prioritizing recipients of state support
• Implementation of comprehensive programs of support from the authorities of different levels and development institutions
• Building a strategic dialogue between public authorities and the professional community, which leads to an increase in the quality of decisions through additional expertise from the cluster

The constituent entities of the Russian Federation have more than a dozen agricultural clusters at different stages of development. In this regard, an inventory of development models, identification of problems and barriers to the creation and development of agricultural clusters are becoming topical tasks.

Although the use of cluster strategies in agricultural production creates synergistic and multiplier effects and can become a driving force for economic growth, domestic cluster systems have not yet found widespread use. Despite the fact that agricultural enterprises receive significant competitive advantages within the cluster, and in general, various synergistic and multiplicative effects are formed for the cluster giving additional impetus to development, large-scale implementation of cluster initiatives is not observed in the regions, and clusters are not common as a form of collective added value creation. [12, 13]. In this regard, the implementation of a cluster strategy to increase the competitiveness of agricultural enterprises is a timely and very urgent task.

The scientific literature does not reflect the awareness of the role and influence of the use of cluster strategies to increase the competitiveness of cluster associations. Researchers focus on certain aspects of the functioning and development of agricultural clusters without paying due attention to development strategies that affect the growth of agrarian enterprise competitiveness in clusters established.

With the aim of the objectivity and reliability of the cluster participant competitiveness research, a conceptual outline of the assessment of their competitiveness has been developed, which includes six successive phases of implementation and includes a comparative reference approach to measuring the current position of and forecasting the development of their competitiveness. The model can also be formed by comparing the current position of the enterprise with the position of the most successful direct competitor.

The development mechanism of the agrarian cluster should be based on the growth of the competitiveness of agrarian enterprises considering a number of internal as well as external factors. Therefore, an agrarian cluster is a group of interrelated (geographically, economically or organizationally) economic entities, the aggregate of which may include agricultural and processing enterprises, structures from the system of state (municipal) power, service organizations, as well as research and educational organizations.

Organizational and economic mechanism of cluster development of agricultural enterprises that has a vector to increase the competitiveness of cluster members should include a number of provisions: identification of a priority sub-industry, i.e. a cluster founder; identification of priority intra-industry (vertical) links between enterprises of the cluster; building mutually beneficial horizontal links between enterprises of various industry branches; sorting enterprises and organizations that have access to specialized factors of production (innovative technologies, intellectual and financial capital, infrastructure facilities, etc.); development of infrastructure and regulatory framework for the implementation, growth and development of cluster initiatives.

Therefore, the cluster strategy is a long-term roadmap for activities that include a wide range of regulatory and managerial decisions aimed at creating favorable conditions for achieving the development goal of cluster members. Simultaneously, the cluster participants can fairly promote its own economic and non-economic (reputational) interests without infringing or discriminating against the interests of other enterprises taking into account the backbone factors that determine the continuum of design, operation and development of agricultural clusters.

External factors determine the boundaries of development and create the environment, in which agricultural clusters develop [14, 15]. These parameters involve internal factors that directly affect the of the cluster as a whole and its members, namely: the competitive potential of enterprises integrated
into the cluster; predominant activities; the degree of intra-cluster interaction and cooperation. Internal and external factors in their interaction form the environment, in which cluster initiatives are implemented and define intra-cluster and inter-cluster connections and interaction. [16].

Agrarian clusters should be focused on increasing the competitiveness of all its participants through scientific, technological and industrial exchange, the use of new marketing tools (co-branding and co-competition), as well as institutional support (government participation, formal and informal partnerships within and outside the cluster).

The mechanism of agricultural clusters consists of two structural blocks: modeling the most efficient structure of the cluster and quality of its production, technological and technical infrastructures; building an adaptive algorithm that mediates the efficiency of development of the cluster and its competitiveness.

The transition from the first structural block to the second one is performed through an institutional mechanism, which is a formalized structure that strategically coordinates the interaction of agricultural enterprises integrated into the cluster in order to simultaneously achieve two targets: ensuring the systematic operational functioning of the cluster and stimulating the growth of the competitiveness of the cluster members, i.e. agrarian enterprises.

Such a system causes stable cluster effects, the most significant of which are: an increase in the adaptability of cluster members to changing environmental conditions due to the modification and upgrading of production; strengthening specialization and complication of cooperative ties within the agrarian cluster; guaranteed resource provision (financial, material, intellectual, informational); increased productivity by reducing costs and creating a competitive product line; increasing the interest of agricultural enterprises in the final results along the entire chain of product movement starting, through processing enterprises up to the sphere of sales and after-sales service.

The mechanism is based on the interaction between the cluster members and their ability to generate innovative technologies, to produce and promote products to target markets, and, thereby, through synergy, to ensure the growth of the competitiveness of the cluster members [17, 18]. Thus, summarizing, it is possible to put forward the main prerequisites for the effectiveness of the strategy: the competitiveness of the cluster members forms the competitiveness potential of the cluster, the consolidation of the strategic interests of the cluster members will ensure their interest and the necessary dynamics of development, the use of foresight technologies when creating a competitive strategy, since the effectiveness of its implementation is largely depends on external economic factors and trends [19].

At the same time, the strategic goals of the cluster should be subdivided into socio-economic and reputational ones; the growth potential of competitiveness must be analyzed from the standpoint of resource security. In addition, attention should consider the constancy of the product line of the cluster members to ensure the ability to meet the demand for products and the economic effect of increasing its competitiveness. [20].

To assess the achievement of the target benchmarks of the strategy for increasing the competitiveness of the agricultural cluster, it is taken into account that the competitive potential of agricultural enterprises integrated into the cluster determines the totality of the resulting cluster effects.

To do this, the indicators included in the assessment of the achievement of the target goals of the strategy for increasing the competitiveness of the agricultural cluster are structured into groups of indicators, such as the total revenue of the cluster enterprises, the volume of attracted investments, the number of new jobs, etc. [21, 22]

To analyze the degree of achievement of strategic targets, structured indicators are used, such as the total revenue of the cluster enterprises, the volume of investments, the number of new jobs, etc. The use of such indicators allows assessing the involvement of the competitive potential of all cluster members and the growth of overall competitiveness in dynamics. Comparison of the achieved results with a comparison base, which can be presented as a reference model, will allow assessing the level of deviation in fractions of units or percentages to the reference, formed based on a foresight forecast considering the strategic guidelines for cluster development. To test this methodology, a strategy was developed to increase the competitiveness of agricultural enterprises in the Kaluga region, which were a part of the Green Lines LLC agrarian cluster (table 1) [22].
Table 1. Main results of the SWOT analysis of the Green Lines LLC agricultural cluster.

| Factors of the internal agricultural cluster environment | Strengths                                                                                                                         | Weaknesses                                                                                                                           |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Factors of the internal agricultural cluster environment | Availability of scientific, experimental design and educational base (agricultural universities, design bureaus).                    | An underdeveloped segment of high-tech enterprises that are able to provide services to the anchor enterprises of the cluster based on outsourcing terms. |
|                                                          | Roadmaps for cooperation with innovative companies in the industry.                                                                  | Insufficient level of development of the logistics infrastructure within the cluster.                                                |
|                                                          | Experience in the development and manufacture of high-tech products.                                                                    | Limited opportunities to attract investment resources.                                                                               |
|                                                          | Provision with energy resources.                                                                                                     | High dependence on imported machinery and equipment, seeds, and other anchor enterprises.                                           |
|                                                          | Availability of a developed production infrastructure of the intra-cluster association.                                              | Unsatisfactory technical and technological level of fixed assets.                                                                       |
|                                                          | High level of cooperation among the participants.                                                                                     |                                                                                                                                     |
| Factors of the external agricultural cluster environment  | Possibilities                                                                                                                     | Threats                                                                                                                              |
|                                                          | The mechanism of state support for agricultural clusters and the priority importance of the agribusiness, the enterprises of which are the main suppliers of products. | Sanctions regime for certain types of raw materials and products.                                                                     |
|                                                          | Formation of a special economic zone in the territory of the presence of the agricultural cluster.                                   | Underdevelopment of development institutions in the territory of the cluster's presence.                                               |

The strategic goals of the cluster strategy were defined as formation of the infrastructure of the production chain for the creation of a product line; achievement of import substitution of meat and dairy products; growth in investment amounts; R&D; development of new technologies and products in the meat and dairy segment; formation of infrastructure and involvement of new regional innovative enterprises of various formats into the cluster.

A model has been developed on ranking the types of products by economic parameter (profit, return on investment, unit price, labor intensity, prime cost, etc.). The optimal product line is considered to have the highest rating in relation to the ranking indicator considering the constraints on production resources.

Based on the data of the enterprises participating in the Green Line LLC cluster and using a simulation method, a sample was built, each element of which is a vector. The coordinate of the vector is the share of investments in one of the areas of activity of the cluster enterprises: organic crop products; baby food; fodder production. The largest indicator in terms of income from the production of baby food is 2,428,300 rubles, which corresponds to the total cost of resources of 1,639,000 rubles. The most profitable option for the distribution of resources, the income from organic products for which will amount to 2,482,700 rubles, has been obtained as a result of the allocation of resources in the amount of 1,908,000 rubles. However, the increase in income will be 48% in the first option, while it will be only 30% in the second one.

Thus, when determining the optimal diversified product portfolio of Green Line LLC, one should choose the first of the options for allocating resources between the three main product areas [17]. In the course of the study, the target values of the main indicators for assessing the achievement of the strategy for increasing the competitiveness of the agrarian cluster have been identified and are presented in table 2.
4. Conclusions

Thus, the performed analysis proves that the formation of a system of influence on the competitiveness of cluster members based on cluster strategies makes it possible to maximize the competitive potential of the cluster participants and the cluster itself to identify timely strengths and weaknesses for the development of external opportunities with the existing or projected level of development threats.

The developed model of the strategy for increasing the competitiveness of the agricultural cluster from the methodological point of view is an outline that describes the parity between the development targets and the competitive potentials of the cluster. It is a universal management toolkit, which is designed considering the current theoretical provisions of competition and methodological foundations of strategic, sectoral, industrial and operational financial management. Such an integrated approach is able to ensure the formation of a reliable information base for decision-making, proves the feasibility and rationality of these decisions, which will stimulate the growth of the competitiveness of the agricultural cluster in the context of macroeconomic instability.

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