PRINCIPLES AND CLASSIFICATION OF THE FORMATION AND FUNCTIONING OF CLUSTER STRUCTURES

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Abstract. This thesis analyzes the economic foundations of the formation of cluster structures, the principles governing their functioning, and the main criteria for their classification. Particular attention is paid to the role of cluster structures in strengthening economic relations among enterprises, suppliers, research and educational institutions, financial organizations, and public institutions. The study also examines the classification of cluster structures according to their geographical coverage, field of activity, position within the production chain, and organizational characteristics. The importance of specialization, cooperation, competition, innovation, mutual benefit, and economic independence for the effective functioning of clusters is substantiated.

Keywords: cluster, cluster structure, clustering, cooperation, specialization, innovation, competition, regional cluster, sectoral cluster, economic development.

The intensification of competition in the global economy requires the search for more effective forms of organizing production. In this context, not only the internal capabilities of individual enterprises but also their relationships with suppliers, consumers, research organizations, educational institutions, and other economic entities are becoming increasingly important. From this perspective, cluster structures represent an effective organizational form for bringing interconnected economic entities together within a common environment of cooperation.

The development of the cluster approach is closely associated with the processes of territorial concentration and specialization of production. Michael Porter's scientific contribution is particularly important in the development of cluster theory. Porter defines a cluster as a geographical concentration of interconnected companies, suppliers, and related institutions operating in a particular field. According to his approach, such proximity creates favorable conditions for increasing productivity, accelerating innovation, and facilitating the emergence of new businesses [1].

In Uzbekistan, clustering is also becoming an important instrument for modernizing the economy, integrating different stages of production, and creating higher value added. The cluster approach is particularly expanding in agriculture, textiles, processing industries, and related sectors [2].

Economic Foundations of the Formation of Cluster Structures

The formation of a cluster structure is primarily associated with the presence of economically interconnected and mutually interested entities within a particular region or sector. Such a structure may include major manufacturing enterprises, suppliers of raw materials and components, service providers, logistics and trade organizations, financial institutions, higher education institutions, and research centers.

Unlike a simple association of enterprises, a cluster forms a system of economically beneficial relationships. Its participants retain their legal and economic independence while cooperating at different stages of the overall value creation process. Such an approach makes it possible to reduce administrative and organizational costs while preserving the independent economic interests of the participants [2].

According to Axmedjanov's study, a cluster may include not only large manufacturing companies but also small and medium-sized enterprises, technology parks, universities, public institutions, and civil society organizations. Such a composition makes it possible to combine the production, scientific, educational, and institutional capacities of the cluster [2].

When forming a cluster structure, it is important to consider the existing economic potential of the region. Natural resources, labor market conditions, infrastructure, existing enterprises, scientific capacity, domestic and external market demand, and export opportunities should be assessed. A cluster can function sustainably only when it is based not merely on an administrative decision but on real economic relationships and market needs.

The effectiveness of cluster structures directly depends on the principles according to which relationships among participants are organized. First of all, the principle of specialization is of particular importance. Specialization of cluster participants in specific products, services, or technological processes makes it possible to deepen the division of labor and increase production efficiency.

The second important principle is the principle of cooperation. Within a cluster, enterprises may cooperate in production, logistics, marketing, research and development, personnel training, and other areas. This creates opportunities to jointly organize certain processes that would be more costly for individual enterprises to carry out independently.

The combination of competition and cooperation is another distinctive feature of cluster functioning. On the one hand, cluster participants compete with each other in the market through their products and services. On the other hand, they may cooperate in areas such as common infrastructure, skilled human resources, research and development, and information exchange. Porter's research demonstrates that local competition, knowledge exchange, and interrelationships within clusters can enhance productivity and innovative activity [1].

The principle of innovation is also important for the long-term development of clusters. A modern cluster should not be limited to bringing together existing production capacities. Its activities should be directed toward introducing new products, technologies, management methods, and production processes. The participation of research institutions and universities in cluster activities can accelerate this process.

The principle of mutual benefit ensures the stability of relationships among cluster participants. Each entity should obtain an economic or technological benefit from participation in the cluster. If the interests of cluster participants are not aligned, the formation of long-term cooperation becomes more difficult.

The principle of economic independence is also significant. Cluster participants do not become a single enterprise or administrative organization. They continue to operate as independent economic entities while developing cooperative relationships based on common economic objectives [2].

Classification of Cluster Structures

Cluster structures differ in their forms and composition. Therefore, they can be classified according to several criteria.

According to geographical coverage, clusters can be divided into local, regional, interregional, national, and international clusters. Local clusters are generally formed within a city or district. Regional clusters operate within a region or economic area. Interregional and international clusters extend economic relationships across several regions or countries.

According to the field of activity, clusters can be classified as industrial, agricultural, textile, food-processing, pharmaceutical, IT, tourism, logistics, energy, and service clusters. In the modern economy, clustering is developing not only in traditional production sectors but also in knowledge- and technology-intensive industries.

According to the nature of economic relationships, clusters can be divided into horizontal and vertical forms. Horizontal clusters are characterized by relationships among enterprises engaged in similar or closely related activities. In vertical clusters, a technological chain is formed that may extend from the supply of raw materials to the production of finished goods and their delivery to consumers.

According to technological orientation, traditional and innovation clusters can be distinguished. Innovation clusters are characterized by close relationships among research centers, higher education institutions, technology parks, and technology companies. Their primary objective is to introduce new knowledge into production and transform it into economic value.

According to organizational form, cluster structures can be centralized, network-based, or mixed. In centralized clusters, other entities are organized around a major enterprise, whereas in network-based clusters, relationships among participants are relatively more balanced.

Axmedjanov identifies the ability to integrate organizations with different forms of ownership, organizational and legal status, sectoral and geographical affiliations into a system for creating high-value-added final products as one of the important advantages of clustering [2].

Stages of Forming Cluster Structures. The formation of a cluster structure can be carried out in several stages. First, the economic potential of a particular region or sector is analyzed. Existing enterprises, production volumes, labor resources, infrastructure, market demand, and export opportunities are examined.

At the next stage, potential cluster participants are identified. In addition to major producers, suppliers, service providers, research institutions, higher education organizations, financial institutions, and other stakeholders may be involved.

The existing economic relationships among participants are then identified. In particular, it is important to determine gaps in the production chain, missing links, technological problems, and financial constraints. This analysis makes it possible to establish an appropriate cluster structure.

The next stage involves developing the organizational and management mechanism of the cluster. The responsibilities of participants, forms of cooperation, sources of financing, and common development objectives are defined. At the final stage, cluster activities are regularly monitored, and indicators such as production efficiency, innovation activity, employment, exports, and value-added creation are evaluated.

International experience also demonstrates the importance of considering public policy, innovation, technology, and the specific economic conditions of a region when establishing clusters. Karimova's study analyzes the formation of cluster policies in different countries and their impact on economic development [3].

Prospects for Developing Cluster Structures in Uzbekistan. In Uzbekistan, the development of the cluster system is particularly evident in agriculture, cotton-textile production, and processing industries. The cluster approach contributes to integrating separate stages of production, increasing the depth of raw material processing, and expanding opportunities for producing finished goods.

Karimova's study notes that the cluster approach is being used in agriculture, light industry, and processing industries in Uzbekistan, while also identifying certain organizational and financial challenges in cluster activities [4].

Therefore, future cluster development should focus not merely on increasing the number of clusters but on improving the depth and efficiency of economic relationships within them. In particular, strengthening cooperation between cluster enterprises and higher education and research institutions, financing innovative projects, training qualified specialists, and introducing digital technologies are among the important priorities.

Cluster structures represent systems formed on the basis of common economic interests among interconnected enterprises, research and educational institutions, financial organizations, and other economic entities. Their main characteristic is the preservation of the economic and legal independence of participants while maintaining cooperative relationships.

The effective functioning of clusters depends on such principles as specialization, cooperation, the combination of competition and collaboration, innovation, mutual benefit, and economic independence. Cluster structures can be classified according to geographical coverage, field of activity, nature of economic relationships, technological orientation, and organizational form.

The analysis demonstrates that the effectiveness of a cluster is determined not simply by the number of enterprises concentrated within a particular territory but by the existence of genuine economic, technological, and institutional relationships among them. Therefore, improving cluster policy in Uzbekistan requires consideration of the economic potential of regions, adaptation to market demand, strengthening cooperation between science and business, and the development of production chains aimed at creating high value added.

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