

Research of organizational and economic resources, participants, cooperation of clusters in a certain territory

Investigación de recursos organizacionales y económicos, participantes, cooperación de clusters en un territorio determinado

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ABSTRACT:

The highest labor productivity is observed in firms connected by a flexible organization and constantly innovating. The cluster approach is one of new. For the entire economy of the region, clusters act as points of growth in the domestic market. The source of competitiveness of the regions is the successful use of local features. The participation of regional authorities in the creation and development of clusters is particularly important in the early stages of cluster formation and is reduced to assessing the region's economic potential.

Keywords: cluster, resource management, cooperative links, territory.

RESUMEN:

La productividad laboral más alta se observa en empresas conectadas por una organización flexible e innovando constantemente. El enfoque de clúster es uno de los nuevos. Para toda la economía de la región, los clusters actúan como puntos de crecimiento en el mercado interno. La fuente de competitividad de las regiones es el uso exitoso de las características locales. La participación de las autoridades regionales en la creación y desarrollo de clusters es particularmente importante en las primeras etapas de la formación de clusters y se reduce a la evaluación del potencial económico de la región.

Palabras clave: clúster, gestión de recursos, enlaces de cooperación, territorio

1. Introduction

In conditions of increasing divergence in the levels of formation of regional territorially-

localized subsystems of the national economic space, the priority task is the development of a cluster management model that is the territorial concentration of a set of interconnected business interests of enterprises, as well as state and public socio-economic institutions necessary for the development of competitive advantages of clusters and regional economic systems m.

The process of functioning and development of spatially localized economic systems (clusters) is based on the principle of territorial concentration of economic resources, information exchange about needs and technologies between enterprises of related industries, buyers and suppliers. The key moment of cluster formation is the market mechanism of mutually beneficial cooperation between enterprises located on the same territory, which is explained by a decrease in a number of transaction costs and the emergence of positive feedbacks that ensure the intensive development of all enterprises within the cluster.

In this regard, the positive side of the cluster approach is not only a reduction in transaction costs, but also an increase in the efficiency of specialization of combined (within the cluster) production through the concentration of resources, production, consumers and suppliers in one economic space.

This actualizes the problem of using cluster approaches in managing the processes of formation and development of regional economic systems, necessitates the scientific substantiation of algorithms for creating cluster-type enterprises, the development of organizational and economic instruments for cluster management, taking into account the sectoral and regional features of the development of territories, as well as analysis of external and internal factors environment of the regional economic system.

2. Literature review

The idea that the success of the national economy depends, ultimately, on the development of the local concentration of specialized industries, first appeared more than a century ago in the works of Alfred Marshall (1890). He was the first economist to investigate the synergistic effect achieved by uniting enterprises. A. Marshall in his works identified three types of benefits obtained by closely located firms:

- knowledge sharing and innovation (the effect of knowledge overflow);
- sharing of labor resources;
- free access to suppliers.

The founder of the modern concept of clusters and their influence on competitiveness is M. Porter. Under his leadership, fundamental studies of clustering processes were carried out.

Of the recent foreign studies successfully developing the topic of industrial regional and local clusters, it is necessary to mention such authors as B. Ashim, J. Beckatin, E. Bergman, P. Doring, M. Porter, M. Enright, and others. In Russian science Y. Vinoslav, V. Dementiev, V. Zakharov, A. Margolin, M. Nikolaev, S. Tkachev, I. Ferova, T. Tsikhan, Y. Yakutin and others are engaged in the development of this problem. In the works of these scientists published in the last years, there is an analysis of various aspects of the applicability of the cluster approach to economic development of territories.

The concepts of cluster and cluster policy appear in the 90s of the XX century. At this time, globalization of the world economy is proceeding at the fastest pace. Under its influence, a new model of production organization (post-Fordism) is formed, the specific feature of which is the proliferation of flexible forms of interaction between firms linked by the value-added chain. This was pointed out by the American economist M. Porter, who introduced the term "cluster" into economic science. He and his team came to the conclusion that organizations with high values of competitive advantages under certain external conditions contribute to the growth of competitive advantages of their supplier companies and consumer companies. In this regard, M. Porter introduces the concept of "sectoral cluster", which defines as "an informal community of industry and mixed companies characterized by the ability to mutually enhance their competitive advantages". This is due to the high requirements for consumer quality products of their subcontractors.

Two works by M. Porter, "Competitive Advantages of Nations" and "Competition", in which the author describes the close interrelationships between cluster partnerships, the competitiveness of firms, industries and national economies, made a significant contribution to the theory of clustering.

The theory of clusters was continued in the works of another American scientist M. Enright. He created the theory of "regional cluster" and gave this concept the following definitions:

- a regional cluster is an industrial cluster in which the member firms of a cluster are geographically close to each other;
- a regional cluster is a geographical agglomeration of firms operating in one or several related branches of the economy.

One of the significant differences in the views of M. Porter and M. Enright is that according to the theory of the latter, the competitive advantages of the state are created at the regional level (according to M. Porter at the national level), where the historical preconditions for the development of regions, the diversity of business cultures, the organization of production and educational institutions. According to the scientist, regional clusters need targeted support of state structures and research organizations.

The theory of clusters is based on the concentration of business in certain geographical boundaries, where the most favorable conditions exist for it. Such industrial groups are more efficient, and the firms and territories in which they are located are generally more competitive.

3. Materials and methods

The object of the study is a group of enterprises forming a cluster of the regional economic system of the Krasnodar Territory. The subject of the study is the functional content, objective factors, organizational and economic trends in the process of clustering enterprises in the format of the regional economic system of the Krasnodar Territory.

The theoretical and methodological basis of the study was the work of domestic and foreign scientists in the field of fundamental problems of regional economy development, management theory presented in the scientific literature, as well as the works of Russian researchers on cluster development in management.

In developing the problem, various methodological approaches were used, including a systematic approach in its subject-object and functional-structural aspects; methods and instrumental technologies of scientific research, tabular and graphical methods of data visualization, the application of which allowed to ensure the validity of theoretical positions and argumentation of conclusions.

The informational and empirical basis of the study was the official statistical and analytical materials of the Federal Service of State Statistics of Russia, the data of scientific publications on the issues under consideration.

Institutional and regulatory basis for the study were federal laws of the Russian Federation and normative acts of the Government of the Russian Federation and the Krasnodar Territory regulating the activities of organizations and the system of local self-government bodies.

The working hypothesis of the research is the assumption that the effective functioning and development of spatially localized economic systems in the form of a cluster, as a configuration of stable interdependent and reproducible economic relations based on the effect of synergetic efficiency and increasing competitive advantages, is due to the need to develop and verify the organizational and economic instruments of cluster management taking into account the sectoral and regional features of the development of the territory thorium, justification of algorithms for creating enterprises of cluster type.

4. Discussion

4.1. The need for cooperation as a reaction to the aggravation

of the situation in the external competitive environment

The need for cooperation, and therefore, in the merger of economic entities into the cluster, is strengthened with the aggravation of the situation in the external competitive environment. In an effort to maintain their own competitiveness, they activate cooperative ties with the closest surrounding. Moreover, competing cluster members realize that joint actions are much more effective for them in solving common problems. As a result, there are many forms of cooperation, due to which the competitiveness of the cluster as a whole increase. It is important to note that ties arise as a result of regular sales transactions, cooperation of actors in the use of common resources: the purchase of raw materials and materials, the training of employees, the acquisition and exchange of information and technology. Working in cooperation with others, a company can achieve competitive advantages faster, cheaper and with less risk and disruptions in work ("*Why are Networks...*", 2005).

If competitive advantages - there are factors determining superiority over competitors, then the elements focused in terms of competition and cooperation make it possible to obtain a synergistic effect from the interconnected functioning, lead to the development of new ways in competition and generate completely new, often completely unexpected, capabilities; human resources and ideas form new combinations. Synergetic effects include:

- close cooperation ties that facilitate the synchronous development of economic entities;
- mutual benefit is obtained from joint activities;
- new participants are attracted, which leads to acceleration of development, stimulation of various approaches to R & D, development and introduction of new strategies;
- the cluster becomes a means to overcome isolation on internal problems;
- information exchange and diffusion of innovations are improved through channels of suppliers or consumers, social norms, etc.

4.2. Cooperation clusters

Cooperative relations are also bilateral: internal - cooperation of economic entities that are members of the cluster, and external - coherence between cluster participants with "external" organizations. At the same time, there is a high density of connections between the cluster participants (buyers, suppliers), united by one sphere of activity and involved in the production of goods (services) - close substitutes; as well as with other subjects of the regional economy, which are attributed to the elements of infrastructure support for the cluster (scientific and educational institutions, commercial chambers, industrial and professional associations, trade unions, technology transfer organizations, etc.) in a certain territory.

The density of links is understood as compliance with the following conditions:

- the mutual importance of ties;
- personal character of the relationship, i.e. regular personal contacts between the participants of the cluster.

Non-fulfillment of the condition of mutual significance of relations is manifested either when the relationship is not significant for the buyer, or for the supplier. For example, all firms buy goods, the costs for which, as a rule, are not significant for them. The same situation with the seller-seller - she has a lot of buyers, but none of them is key. For this reason, clusters generally do not include industries such as electricity, water, telephone and internet communications, construction, etc. The activities of Gazprom and Russia's railways for many industries are infrastructural, generally valid, i.e. involved in many value chains, and is not included in clusters.

As a rule, a high density of links is mediated by cooperative institutions that initiate and coordinate interactions: professional associations and unions of entrepreneurs, public organizations, chambers, trade unions, cluster development organizations that are formed by their participants in order to coordinate joint projects. By the presence of institutions of cooperation and their development, one can indirectly judge the density of connections

between cluster members. The density of links determines the attitude of an economic entity of a given territory to a cluster to a greater extent. Low density of connections - therefore, it is not necessary to talk about a cluster structure.

With the external environment, the level of connectivity is determined by the level of influence of economic entities entering the cluster on the regional economy. Analysis of the interbranch balance is used to determine the level of cluster connectivity with other activities in the region. In this case, the level of cohesiveness is measured by the ratio of costs incurred by cluster members to purchase goods (works, services) from organizations located in the cluster region (this may be an administrative entity), to the extent of cluster implementation.

For example, researchers from the Virginia (USA) economy provided such an example: the state's chemical industry has a level of influence (external bonding) of 0.3447. This means that every dollar spent on the purchase of chemical products leads to the fact that the industry purchases from the subjects of other industries in the state for the amount of 34.47 cents, while the level of influence of the oil and gas industry of the state is only 0, 1254. This area of activity is weakly related to other activities in the region's economy.

4.3. Diffusion, information and activities of economic entities in the cluster

The diffusion processes accompany the activities of economic entities in the cluster and affect many spheres of activity.

Diffusion from the Latin. diffusion – spread, spreading, dispersion, interaction – the process of mutual penetration of molecules of one substance among molecules of another, leading to a spontaneous equalization of concentrations throughout the volume (www.wikipedia.ru). Such a definition is encountered in the natural Sciences, but which gives the essential representation of this process. Sociological dictionary defines this concept as follows: – the dissemination and adoption of certain objects (innovation, information, cultural elements) in the social system; borrowing, assimilation of elements of other cultures.

Under the diffusion process in clusters, we will understand the process of mutual penetration and distribution of objects, processes and phenomena, patterns of behavior between economic entities of the cluster of knowledge, information, technology, etc. With this viewpoint, it is the definition of a cluster in the work of G.B. Kleiner, R.M. Kachalov, N.B. Chest: "is the economic system, formed by a group of geographically neighboring economic agents, interacting with each other through exchange of services, people, ideas and information and receiving the result of the synergistic effects of certain competitive advantages". Clusters are more dynamic than other forms of spatial localization of the master leading technologies and penetrate new and growing markets, these are their competitive features and benefits.

In conditions of high competition between members of the cluster source of competitive advantage and overcoming "bottlenecks" are knowledge and information. The strategic resource of the postindustrial society (Bell, 1986) differs from the traditional factors of production the fact that "knowledge does not decrease as their use". As people need information to develop intelligent, adaptive behavior, and any business entity required critical mass of information for successful survival in a rapidly changing market. A cluster is a concept of a postindustrial society based on knowledge.

Knowledge and information determine something new, and obtaining, sharing and application in economic activity of subjects of the cluster of knowledge and information for the emergence of innovation. Clusters are developed around advanced knowledge, because constant dynamics of adaptive action between competition and cooperation promotes the search of new knowledge. As a result of this unity clusters not only contribute to the competitiveness and efficiency of the interacting business entities, but also act as a condition of their innovation development and economy of the region as a whole.

4.4. Innovative activity of the subject clusters

Innovative activity of the subject is a planned, systematic, creative work aimed at the

transformation of the existing knowledge in the framework of the final product (services), technology and process, culture and society, as well as the identification of new knowledge to ensure that this knowledge was useful later to get a new product or service, new process or technology, as well as to significantly improve an existing product or process. But innovation is also influenced by the nature of the resulting knowledge and information. If the participants are guided only by the inner knowledge of the regional culture, the innovations are more incremental in nature.

If entities incorporated into the system of conversion of external knowledge, such a joint work is focused on the creation of radical innovation. It's close "models of exogenous development" B. Ashima and A. Isaksen. They 4 identified the possibility of creating incremental innovation in the cluster:

- through interaction between firms-manufacturers and firms-customers;
- through information exchange between employees of companies;
- via the intra-diffusion of innovations;
- by cooperation with local governmental organizations.

The term "innovation". Schumpeter began to use in 30 years of XX century, understanding the changing innovation with the aim of implementation and use of new types of consumer goods, new production, means of transport, markets and forms of organization in industry. According to Schumpeter, innovation is not an improvement, and a substantial change in the functions of manufacture, consisting in the new connection between the production means.

Of course, the analysis of innovative development includes the evaluation of innovative potential, the research of regional innovation systems. Exploring the clusters, the problem is seen in the justification of such form of interaction of economic entities characteristic of the clusters as a factor determining the superiority of a subject in obtaining a competitive advantage through diffusion of innovation.

4.5. Diffusion of innovations in education cluster

The concept of "diffusion of innovation" has become the object of special attention of cluster researchers. M. Enright, referring to the growth of labor productivity and production efficiency of cluster enterprises, pointed to the accelerating rate of diffusion of innovations in comparison with other forms of organization of production. In the model of innovative regional growth, A. Anderson and J. Mancinen used the theory of knowledge creation and diffusion when studying the factors of regional development. In the "ideal" cluster of M. Storper, the important role of diffusion of innovations, information and knowledge is also assigned.

In 1962 E. Rogers proposed the so-called theory of diffusion of innovations (Rogers, 1983). Analyzing the data of several studies, he came to the conclusion that the process of adopting new ideas and goods includes 6 stages: attention, interest, evaluation, verification, acceptance, confirmation. Adoption of innovations is a general social process.

From the point of view of the creator of the theory, initially a novelty must learn, most often from the media, a fairly large number of subjects. Then it takes on a small group of innovators (2.5% of subjects) who are more mobile, contact, easily perceive ideas and are ready to take risks. They are followed by early adherents (13.5%), opinion leaders. They, considering the novelty useful, convince to try it others. There comes the stage of acceptance of innovation by an early majority (34% of the population). Then the novelty is later recognized by the majority (also 34%). And, finally, the innovation is accepted by late adherents (16%) - conservatives who are suspicious of everything new. Innovation is recognized by society, if it is taken from 6% to 16% of the population. Such arguments are fully relevant to the diffusion of innovation between economic entities of the cluster with the only difference that the group "conservatives" is absent, and the time interval for the spread of innovation is much shorter.

Earlier E. Rogeras, in the mainwork "Diffusion of Innovations as a spatial process" (was published in 1953), T. Hegerstrand also worked on the development of the theory of

diffusion. The researcher believed that one generation (generation) of innovations has four stages: the emergence, diffusion, accumulation and saturation. Diffusion (distribution, dispersion) through the territory of various innovations (new types of products, technologies, organizational experience ...), according to T. Hegerstrand, can be of three types:

- diffusion of expansion (the innovation is evenly distributed in all directions from the point of origin);
- diffusion of movement (propagation in a certain direction);
- mixed diffusion, assuming the elements of the first two.

The essential content of all the types of diffusion presented is identical and corresponds to the main methods of diffusion of innovations in clusters considered.

4.6. Basic ways of diffusion of innovations, knowledge and information by subjects of a cluster

Thus, we consider the main ways of diffusion of innovations, knowledge and information by the subjects of the cluster, whose activities are of an innovative nature. It should be noted that this does not exclude the possibility of applying some or other possibilities for correcting behavior by large economic entities.

Firstly, the way is "imitation", the essence of which is that "imitators" closely follow the "innovator" and, making sure that success is really achieved, apply the ideas of the discoverer.

Secondly, "rivalry". This mechanism is in fact equivalent to compelling to innovate. Indeed, the growing competitiveness of the initiator of change, means for its rivals the threat of exclusion from the market. They are forced to copy the novelty or look for asymmetric answers.

And, finally, the third way is "synergy". This mechanism is associated with the inclusion in the process of evolution of an economic entity, located along the technological chain from the innovator. Its essence lies in the fact that interacting economic entities demonstrate a much more powerful and stable tendency to growth than isolated ones.

The existence of diffusion processes among the economic entities of the cluster significantly reduces the costs of obtaining its "key resource", first of all actual knowledge, which can become a competitive advantage of the subject and which, as a rule, is highly personalized, and can be effectively spread only through personal contact. This is information about the latest changes, the experience of specific people who got it through trial and error. Innovations directly depend on access to knowledge and information. Therefore, innovations are extremely unevenly distributed in space. This is one of the reasons why economic entities are localized in clusters.

The second reason is that innovative activity implies the coordinated work of many organizations: suppliers of components, manufacturers, sellers, consumers, financial organizations, etc.

Why do market subjects tend to cluster? This desire to obtain positive effects from diffusion processes, to be able to obtain various advantages, primarily of an institutional nature, with the least cost. Innovations of the subject here - is the result of this involvement in joint activities, i.e. Innovations are secondary to the cluster. The success of a cluster participant will be determined by how effectively the economic entity can apply the existing opportunities in the competition.

In this respect, the question of the motives and incentives of economic actors acting as participants in the cluster, to the creation, dissemination and application of innovations is important.

With the decrease in the severity of competition in the external environment, when the cluster members cooperate in opposing the environment, the opposite situation usually arises, distancing, searching not for the allies, but for "new combinations of changes in development" (Schumpeter, 1982). Strong competition becomes an incentive for the

development of each individual economic entity of the cluster.

Competition is a factor in the growth of production, which directly or indirectly stimulates innovation - a process that J. Schumpeter called "creative destruction" or "creative destruction". Thus, there is a close correlation in the behavior patterns of cluster enterprises between "cooperative competition" and innovation activity.

There is a number of empirical evidence in the framework of studies conducted by foreign scientists, the direct relationship between competition and innovation activity of economic entities. However, the impact of competition on innovation is mixed.

On the one hand, innovation can stimulate a closed (for outsiders) competition between companies that are old-timers of the market. On the other hand, the possibility of obtaining a certain market share can also become a strong incentive to introduce innovations (the so-called "Schumpeter effect").

In the cluster, different forms of organization can be distinguished: many "atomic" small entities dominate or one large economic unit dominates. All forms reflect the degree of "symmetry of the distribution of market power" (Markov, 2006). Thus, economic entities with a high market share have less incentive to engage in innovation, and monopolists generally introduce innovations least of all.

It should be noted that in the works of foreign researchers the level of concentration is considered to be an indicator of competition, and in the works of domestic scientists competitiveness is determined by means of two indicators - productivity Labor in gross value added (GVA) relative to the industry average and the logarithm of labor productivity by GVA.

Thus, the most significant contribution to productivity is made by the technological capital of enterprises (capital-investment and the creation of an IT department), as well as the implementation of international certification according to ISO standards.

Another important point regarding the nature of innovation carried out by business entities in conditions with high and low shares of capital concentration. In the former case, there are more incentives to create innovations, and in a highly competitive environment, smaller actors tend to produce radical innovations (Blundell, 1999).

It is generally believed that subjects with a high market share, usually large firms, are more innovative due to high cash flows. However, among the main incentives for such activities are high marketing skills that are important in the commercialization of innovations, and the desire of such companies to obtain high ratings in stock markets, which is not typical of small and medium-sized businesses. In some cases, large companies are purposefully going to increase competition to create radical innovations.

Although the desire to innovate is usually explained by the desire to avert the threat of competition from new entrants or actively developing old ones, in general, the increase in such a threat has an overall stimulating effect on innovation activity (Aghion, 2006) in the cluster economic entities.

Thus, the motivation of innovative activity of subjects is determined by the following aspects:

- the nature of the connections between the cluster members (horizontal and vertical);
- the size of the business entity (large, medium and small business);
- market share and labor productivity (competition indicators).

4.7. Type of interaction between the cluster participants determines the conditions for the formation of innovations

The direction of the interconnections in the cluster is as follows: vertical links (top-down, bottom-up, called corporate) - cooperation between economic entities occupying different levels in the production chain; horizontal connections - disperse connections - competition between entities occupying the same level in the production chain. Cluster characterizes the competition of subjects horizontally and cooperation - vertically (Guliy, 2009), then the conditions for the formation of innovations are different (Table 1).

Table 1

Conditions for the formation of innovations by the subjects of the cluster.

Type of interaction	Features
Vertical	more accessible unique local assets increased specialization, facilitated exchange of knowledge and ideas more demanding demand and better supply
Horizontal	cooperative inter-firm training, promoting product and process innovation, rapid response to the requirements of technological change as a network - the process of training along regional arrangements (these are social norms, not economic rules)

Source: Prepared by the authors.

Constantly emerging contradictions between the internal and external environment increase the ability of the cluster to adapt to any changes in the market situation both inside the cluster and outside it, i.e. there is an evolutionarily formed mechanism for the adaptation of cluster members to new conditions. The adaptive capabilities of adapting to changing environmental conditions in clusters allow to strengthen the competitiveness of the cluster and its participants, increase productivity (productivity) with any changes in the market infrastructure, redistribute agglomeration resources into "growth points", or send to eliminate "bottlenecks", etc.

Cluster as a special form of interaction of economic entities provides opportunities for applying the positive effects obtained for development.

5. Conclusions

First, clusters have certain common properties, conditions of origin and patterns of development that are inherent in all cluster structures, regardless of their nature, but the specific features of economic clusters are also present.

Secondly, the formation of a specific system of relations of economic entities that distinguishes clusters from other forms of interaction between entities is a condition for them to obtain competitive advantages that are created and are mainly used at the regional level.

Thirdly, the motivation of market actors to function within the cluster is reduced to obtaining positive effects from diffusion processes, the possibility of obtaining, due to spatial localization, with the least cost of various advantages, primarily of an institutional nature; the development of an economic entity is determined by how effectively the participant in the cluster applies the available opportunities in the competitive struggle.

Fourth, the cluster has a powerful adaptive potential due to the resolution of the contradictory interaction of competition (internal and external) and cooperation and generates a number of synergistic effects. As a result of this unity, clusters not only contribute to increasing the competitiveness and efficiency of functioning of interacting economic entities, but also serve as a condition for obtaining competitive advantages.

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