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Infrastructure Support of the Regional Economic Clusters Formation

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Abstract. The article deals with the formation and development of clusters in the priority areas of the region's economy. The world experience of clustering and the possibility of its application in the domestic conditions at the regional and local levels are highlighted. The potential opportunities of clusters forming in the priority sectors of the economy are analyzed. It is proved that the promising directions of clustering the regional economy in the context of strategic guidelines should be aimed at strengthening the processes of inter-economic cooperation of priority areas of the regional economy. The paper also considers the role of infrastructure in the formation and development of regional clusters, the need to change the modern configuration of the innovative infrastructure of the region in order to involve enterprises of municipal districts and urban districts in innovative activities. An approach to the optimization of the process of placing the components of innovative infrastructure in accordance with the degree of innovative susceptibility of municipal districts and urban districts is proposed.

1. Introduction

In the context of globalization of the economy, changes in the role and importance of the main actors of socio-economic development, the sources of competitive advantages of industries and regions are increasingly dependent on local factors and the characteristics of resource potential. The stabilization and further development of the Russian economy depends on the effective development of its regions. Regional economic clusters provide the dynamics of changes in the modern world community. Clustering processes in the development of the region provide an opportunity to create conditions for the generation of innovations, stimulate the production of innovative products and, in general, increase the competitiveness of individual structures within the cluster, have a positive impact on regional development. The formation of the system of innovative development of regions on the basis of the processes of cluster formation creates the basis of the consolidated economic space of the country, in the formation of which the leading role is played by regional clusters as the basis for the development of regions.

2. Background

Cluster development as a factor of activation of regional economic development is a characteristic feature of the current state of economic processes management in the administrative-territorial entities. The world experience of economic clustering has shown that it has a decisive influence on the processes of strengthening competitiveness and accelerating innovation. The innovative economy,



which is being formed at the present stage, focuses on the priority development of clusters, which are recognized as one of the more effective production systems of the era of globalization. This is a new economic phenomenon, which allows to resist the pressure of global competition and meet the requirements of national and regional development, which confirms the relevance of the problem.

It should be noted that first of all the effective development of regional infrastructure depends on the use of new approaches to the definition, formation and attraction of investments that determine the success in achieving stable socio-economic development of the country, which, in turn, forms the prerequisites for increasing the investment attractiveness of the regions and the intensification of investment activities. Increasing the activity of investment activity in the regions is one of the main prerequisites for the stabilization and development of the regional economy, but business entities face a shortage of investment resources in the face of uncertainty [1]. Therefore, the implementation of the cluster approach in the regional economy will help to reduce the deficit of investment resources and enhance the investment processes in the region.

According to Professor Lenchuk, an important condition for the economic development of the territories is the formation of clusters. Such forms of production organization create wide opportunities for the use of local resources, the development of investments, including foreign ones; provide access to new markets; provide an opportunity to fully realize the potential of interregional and cross-border cooperation [2].

The concept of cluster development, formulated by Michael Porter, is widespread in the world. Its main idea is to answer the question: "How do clusters increase productivity and accelerate the pace of innovation by firms?" [3].

The cluster is a geographically limited system of enterprises, which provides a cycle from production to sales, which includes: enterprises of the main production, enterprises and organizations serving the main production, financial organizations, as well as research institutions that provide innovative development [4].

Regional clusters are classic (according to the concept of Michael Porter clusters based on the assumption that the industry will flourish in a specialized environment of business communication. The focus is on creating an enabling environment for cluster members and expanding linkages between participating firms, their suppliers, support and related organizations.

The author's approach to the interpretation of the essence of this definition lies in the definition of a cluster as the geographical location of interrelated and complementary companies and organizations, representing one or several related sectors of the economy and create the environment that stimulates concentration, cooperation and competition, increase of professional level of employees, attraction of investments and diffusion of innovations, and contributes to the achievement of synergies and the maximum socio-economic development of the region.

3. Focus of the research

It should be noted that the problems of development and functioning of economic clusters at the regional level is one of the leading issues of modern scientific thought. Modern problems of clustering processes in Russia are determined by the following characteristics: lack of active position regarding participation in clusters of scientific institutions; weak motivation of enterprises in the region with different directions and objectives; various forms of ownership within the created clusters; the lack of funds for the implementation of cluster projects, unwillingness to risk because of the unclear conditions of the clusters [5].

It should be emphasized that one of the most important factors in the efficiency of the creation and functioning of regional clusters is the policy of creating a favourable investment climate in the region, which requires the improvement of investment infrastructure in such areas:

- use of leasing schemes in the investment process;
- stimulation of the development of the infrastructure of audit, consulting and insurance services provided to investors in accordance with the investment legislation;

- attraction of insurance, pension, mutual funds to participate in the financing of investment activities;

- creation of organizational, financial and information base and mechanisms ensuring the practical implementation of the entire cycle of attracting, protecting and financial support of investments [6].

The composition of stakeholders usually includes entrepreneurs, suppliers, educational institutions, organizations and companies of professional support etc.

Generally, cluster structures are characterized by such features as: geographical concentration; specialization; heterogeneity of participants; advantages of cooperation between participants;

- optimal size;
- innovation activity of firms participating [7,8];
- stability of strategic international economic relations within the cluster system, including its interregional and international relations;
- availability of common corporate management systems, business processes, centralized control and analysis.

Disclosure of the potential of the Russian territories in order to increase the rate of economic growth in the framework of a socially-oriented development model is an urgent task of economic development of the country. The Concept of long-term socio-economic development of the Russian Federation for the period up to 2020 as one of the most important conditions for the transition to innovative development is considered "the creation of a network of territorial-industrial clusters that realize the competitive potential of the territories." In 2010, "Methodological recommendations for the implementation of cluster policy in the Russian Federation" were adopted. In accordance with this document, the main goal of the cluster policy is "to ensure high rates of economic growth and diversification of the economy by increasing the competitiveness of enterprises, equipment suppliers, forming territorial and production clusters."

At the regional level, clusters act as a tool for testing new solutions for regional development. These organizational, technological and economic ideas and mechanisms created within the cluster can be replicated in other territories of the country. This means the development of new, promising areas of industry [9,10].

The effectiveness of the cluster model in the priority sectors of the economy is achieved through innovation, development of mutual assistance, a combination of cooperation with competition and the dissemination of information, knowledge, know-how and patents. Clusters are a kind of complexes of enterprises, research centres, scientific institutions, government bodies, trade unions, public organizations connected by the technological chain and complementary to each other. Such complexes are an alternative to the branch approach inherent to the representatives of the traditional development scheme and characterize the current global economy as a network system.

The issues of creation of economic clusters and cluster approach as a tool to improve the competitiveness of the region and individual economic entities are covered in detail in the economic sciences. At the same time, the presence of stable formations in the system of economy, such as economic clusters, allows more efficient use of significant production potential of domestic enterprises, scientific, human potential, to use an extensive system of educational institutions and research institutions, as well as more effectively distribute their limited resources to a certain extent, experience in difficult conditions, economic entities-members of the cluster [11,12,13].

The cluster in the organization of production is considered as an association of complementary enterprises, organizations and related geographic and functional characteristics of public administration, scientific institutions, etc. on the basis of joint activities in a certain area for the production of competitive products in the domestic and foreign markets and increase profits of cluster members [14].

Among the prerequisites for the formation of clusters in the national economy there are the following: organizational (common market of transport services, highly qualified personnel, traffic dispatching, calculation of optimal routes through the coordination of traffic in the network, interest and support from the regional authorities, reduction of fixed costs due to the scale effect), financial

and economic (financing of the governing body through voluntary contributions of participants, the growth of market share and, respectively, income and contributions to all funds, reduction of fixed costs due to economies of scale, the possibility of joint purchases of fuel, rolling stock, etc.), synergetic (profit growth, improving the quality of services, harmonization of the interests of carriers and consumers, improving the efficiency of investment and competitiveness of the industry) [15].

4. Solutions, results and recommendations

In general, the regions of Russia are characterized by a high level of scientific and technical potential, but the leverage for its implementation is not enough, first of all, there is no effective regional infrastructure.

We have identified the following components of the regional cluster infrastructure (RCI):

- economic infrastructure, resources for regional development (professional skills, knowledge, technology, capital),
- institutions for regional policy (regional development agencies, educational and scientific institutions, financial institutions).

At present, we propose to link the successful development of the RCI with the integration processes in the educational sphere, which allow to achieve the effect by combining and coordinating the activities of various elements of the educational process and the economy. Thus, the most effective is the creation of RCI on the basis of higher educational institutions. In Russia, there are three main groups of University innovation structures:

- incubators (multifunctional complexes providing various services to new innovative firms at the stage of emergence and formation);
- technoparks (research and production territorial complexes, the main task of which is to create the most favourable environment for the development of small and medium science-intensive innovative firms);
- technopolises (large modern scientific and industrial complexes, including a university or other universities, research institutes, as well as residential areas, equipped with cultural and recreational infrastructure).

Thus, in our opinion, universities should meet the following criteria:

- communication with business and well-established commercialization of research results carried out in technology parks;
- integration with global innovation infrastructures, in particular with universities and technology parks;
- carrying out large-scale basic research, financed mainly from the budget and various funds on a non-commercial basis; determining the impact on the state and regional scientific, technical and socio-economic development.

Therefore, the main elements of the regional cluster infrastructure are already working in our country, but it is obvious that the infrastructure institutions still do not produce a significant impact on the innovative processes in the economic system of the region, therefore, they do not operate effectively [17]. This is due to the fact that: first, their existing resource (personnel, information) is far from being sufficient for systematic participation in the solution of innovative problems of large industrial enterprises. Second, medium-sized and especially small enterprises are overwhelmingly not innovation-active entities and do not form any significant demand for the services of innovation infrastructure organizations. Third, neither the state nor business support the activities of these organizations, as it is customary in developed countries.

In general, we can talk about the underdeveloped infrastructure, the development of which is mostly constrained by the lack of incentive mechanisms and public information. We are convinced that the development of the regional innovation system is also impeded by the absence of regional innovation development programs – an integrated approach to the formation and regulation of innovation processes in the regions. The consequence is the lack of common rules for the formation

and functioning of the elements of innovation infrastructure in the region, their clear list and system of relationships.

The problem of interaction of regional cluster infrastructure components is uncertainty in terms of management and regulation of its elements. At present, the system of coordination of scientific, technical and economic activities involves state structures that in one way or another have an impact on the functioning of the RCI, but there is no clear distribution of functions and tasks between them.

Based on this, the existing infrastructure is represented by a limited number of its structures, it develops haphazardly, there is functional uncertainty of the infrastructure elements – it does not operate effectively and without proper state support, therefore, it needs the development and coordination of the existing entities at the regional level. That is why, for the government it is urgent to develop a number of measures aimed at promoting the development and effective functioning of the infrastructure of the region, which is a prerequisite for the improvement of the regional system, which combines education, science and production [18,19,20].

If we consider the infrastructure of the regional aspect, it is worth highlighting a number of features that should be inherent in it:

- the infrastructure of a particular region of the country should be completely autonomous from the infrastructure of other regions, that is, work as a separate organism;
- regional infrastructure should be a full-fledged element of the regional economic system and the national economic system, that is, to perform the functions of dual subordination;
- regional economic infrastructure at the regional level should be provided with interregional coordination.

We have proposed the architecture of the regional cluster infrastructure:

Level 1. Financial subsystem: venture funds, budget funds, tax incentives, Bank financing, insurance companies, grant programs.

Level 2. Scientific and educational subsystem: universities, research institutes, a network of training centres, centres of retraining and advanced training.

Level 3. Production and technological subsystem: technoparks and scientific parks, industrial laboratories of scientific institutions, divisions of the region's enterprise, producing innovative products, technological clusters, centres of collective use of equipment.

Level 4. Information and consulting subsystem: regional innovation centres, start-up incubators, co-working centres, centres providing services for certification, accreditation, consulting companies on patenting and protection of intellectual property rights, marketing services.

The proposed architecture of the region's infrastructure includes 4 subsystems, and can serve as a basis for the implementation of the policy of economic, scientific and technological development of the region.

5. Conclusion

Thus, clusters and regional cluster infrastructure created around them form an attractive basis for the implementation of economic development projects, investment flows, development of small and medium enterprises. The application of the cluster approach, the spread of clustering processes of the economy is one of the most effective mechanisms of structural development of the national innovation system.

The gradual increase in the number of cluster structures, their concentration in different regions of the country will lead to the creation of a network of business entities around them, self-organizing on a commercial basis. Thus, the growth of such structures will serve as the basis for self-organization of the system of active cluster infrastructure of the country.

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