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CONCEPTUAL APPROACHES TO THE FORMATION OF ORGANIZATIONAL AND ECONOMIC MECHANISM OF CLUSTER

In the article the experience of the EU countries in the formation of clusters has been considered, and basic models of cluster development and possibilities of their implementation in the Republic of Belarus have been distinguished. The authors have also suggested an organizational and economic mechanism of cluster formation, including cross-border clusters, and they have analyzed the role of universities in the development of cluster structures.

Keywords: *innovation cluster, cluster policy, organizational and economic mechanism, cross-border cooperation.*

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КОНЦЕПТУАЛЬНЫЕ ПОДХОДЫ К ФОРМИРОВАНИЮ ОРГАНИЗАЦИОННО-ЭКОНОМИЧЕСКОГО МЕХАНИЗМА КЛАСТЕРА

В статье рассматривается опыт стран ЕС в области создания кластеров, основные модели кластерного развития и возможности их реализации в Республике Беларусь; предложен организационно-экономический механизм создания кластеров, в том числе трансграничных; проанализирована роль университетов в развитии кластерных структур.

Ключевые слова: *инновационный кластер, коастерная политика, организационно-экономический механизм, трансграничное сотрудничество.*

Introduction. Modern trends in the international economy (globalization, integration, transnationalism) show that one cannot act alone on the world market. The self-preservation of enterprises under the conditions of high level of competition usually threatens to worsen the results of their economic activity: costs increase, business becomes unprofitable, and as a result a considerable number of enterprises have to stop their activity. As enterprises' costs increase and multi-link distribution channels are formed, prices for products increase, which reduces consumer demand.

Economies in developing countries face a complex challenge: how to increase economic growth rates and reach the level of industrialized countries. Statistically, there may be the illusion of gradual leveling of development over the long term. In our view, however, this is unlikely to happen without additional efforts. The reason for this is that there is a tendency to transfer a part of production to developing countries (hence a significant increase in investment), rather than the technologies themselves, which allow making long-term decisions about the direction of development.

While there are differences in the views of different schools on economic activity, they agree that one of the main factors of economic growth is innovations. They make it possible to activate the production process using a constant amount of resources [1]. However, numerous studies show that innovations should have certain boundaries and directions. One way to distinguish them is to form cluster structures [2].

The application of the cluster approach is an economically sound approach to solving management problems at enterprises, as a result of which there is a synergy effect, which allows to achieve an economic effect that is impossible with the dispersed activities of individual firms.

In the Republic of Belarus, no systematic research in the field of clusters and the cluster approach has been conducted until recently, despite the in-depth study of some aspects in the works of domestic scientists. For example, V. F. Bainev, N. I. Bogdan, V. V. Valetko, S. G. Galuza, A. V. Markov, I. A. Mikhailova-Stanuta, M. V. Myasnikovich, L. N. Nekhorosheva, P. G. Nikitenko, B. N. Panshin, S. F. Pyatinkin, N. G. Sinyak, etc. have considered different types of clusters. The advantages of territorial and industrial complexes and the corporate and cluster structure of the economy were substantiated by Ya.M. Aleksandrovich, A.A. Bykov, S.S. Polonik, V.V. Pinigin.

When looking at clusters, researchers note various aspects of their impact on economic growth and improving the performance of actors. There are many definitions of "cluster", different approaches to classification, cluster research and formation of cluster policy. In the

context of the innovative development of the national economy, cluster research currently being conducted does not fully reveal the methodology of the cluster approach to innovative development.

Main part. Clusters, viewed as points of economic growth on the map of Europe, have become important elements of the overall European economic recovery agenda. The policy documents of the European Commission and the EU Council identified clusters as effective means to strengthen regional innovation and reduce the gap between business, research and resources. Moreover, the report on the new long-term EU budget cycle (2021-2027) mentions clusters as a basis for industrial competitiveness under the EU Horison Europe programme to stimulate research and innovation [3].

Unlike the countries of Western Europe, in post-socialist countries at the time of their independence there were no cluster structures, and territorial and industrial complexes (TIC) can be considered as their close analogue. The TIC is based on the principles of geographical zoning and program development of the national economy, which brought its specificity at the stage of primary clustering of the post-socialist economies. Most post-socialist countries in their cluster policy adhere to a transplantation strategy based on attracting foreign investors (Armenia, Kazakhstan), or a hybrid strategy based on involving both foreign and national participants in the clusters (Russia, Belarus).

The degree of formalization of cluster initiatives in industrialized and post-Soviet countries also varies considerably. The evolutionary nature of cluster formation in capitalist countries, as well as the orientation to classical principles of market economy, have contributed to the fact that the phenomenon of clustering is poorly formalized, not regulated at the highest level of government, the measures taken to support cluster initiatives differ significantly not only in different countries, but also within a single state at the level of individual regions. Actually, at the local (regional) level, measures and mechanisms to stimulate (if any) cluster initiatives are being developed. No special regulations are developed (except, perhaps, for Eastern European countries) aimed at regulating the activities of the cluster. In fact, this contributes to the fact that the state cannot initiate clusterization, and its intervention can only be indirect, within the framework of industrial or regional policy.

The countries of the former USSR are focused on a more active role of the state in the formation of the cluster environment, on boosting the processes of economic clustering. On the one hand, this reflects a high degree of interest of the state administration in the development of competitive entrepreneurial structures of the cluster type, and on the other hand, it poses a threat to the formalization of the initialized processes, as a result of which the initiative of economic entities is lost, the degree of interaction between them decreases, which creates very significant risks for the implementation of the cluster model of economic development.

A common task for post-socialist governments is to develop principles for implementing cluster policy based on market mechanisms, to gradually reduce direct administrative interference in the activities of cluster participants, to "embed" a system of incentives for cluster initiatives in the framework of national (regional) economic strategy and industrial policy of the state. The cluster approach to the organization of production, inter-country cooperation of clusters can be used as one of the tools for the formation of a coordinated and subsequently harmonized industrial policy of states within the CES.

As a result of the study of global experience in clustering the economy, the following conclusions can be drawn regarding the role of the state:

– the creation of clusters is not the subject of government efforts, but the result of market development, market regulation initiatives;

– government regulation shifts from direct to indirect impact and does not have a strict focus on subsidizing industry and organizations or directly limiting competition in the market;

– the public sector can act as an active investor, primarily in socially, economically, environmentally, and infrastructurally oriented projects that support cluster development;

– the government should mainly work as an intermediary that connects participants together and provides infrastructure and initiatives that improve the clustering and innovation process;

– cluster policy should not neglect small enterprises, nor should it focus only on classic or long-established clusters;

- if cluster policy needs cluster analysis and specialized disciplines, then government should not focus only on analysis without any real action;

- effective cluster policy implies interaction between researchers, heads of industry and policy makers;

- clusters cannot be created based on the resuscitation of crisis markets or industries, although sometimes cluster policy is used as a special case of protective policy.

Studies conducted by foreign and domestic economists show that European countries use a multi-level mechanism for implementing cluster policy and cluster initiatives. The mechanism includes objectives, principles, methods, instruments and institutions at the regional, national and supranational (pan-European) levels of the EU.

In the EU countries the following models of cluster functioning (and, consequently, various mechanisms for their creation) are most common:

1) model of transnational clusters, where the cluster policy is implemented predominantly "top-down", i.e. the state stimulates cluster development through various activities: creation of a platform for dialogue between different actors of the cluster (mediation policy); diversification of local demand through placement of state orders with local companies (demand policy); upgrading the skills of the local labour force through the implementation of additional education and retraining programmes (training policy); creation of a training centre for the local labour force (training policy); creation of a cluster brand to attract foreign investment (policy to promote international relations); creation of legal, cultural and social environment for transactions (framework policy);

2) cross-border cluster model - cluster policy is also implemented mainly "top-down", territorial coverage - cross-border regions.

The peculiarity of cross-border clusters is that cluster participants are located in different tax, customs and legislative environments of neighboring countries, but may have joint ventures and organizations, use common infrastructure and operate primarily on cross-border markets [4].

Cross-border clusters were created in Europe in parallel with the formation of Euroregions. Many of them work without coordination structures or use the services of regional development agencies, and are also members of Euroregions. It is possible to use Euroregions as coordinating structures of those cross-border clusters, the participants of which are economic entities of the border territories. At the same time, cooperation in the cultural field has extended to education and science, tourism and recreational activities, which has resulted in increased self-employment activity of cross-border residents, participation in public organizations, etc.

The models of transnational and cross-border clusters are characteristic of information and communication technologies, biotechnology, pharmaceuticals and automotive industry;

3) The national cluster model, where cluster policy is top-down for knowledge-intensive industries and bottom-up for other industries. The priority areas of activity are determined in accordance with the programmes for the development of the national economy and, depending on the level of economic development, either innovation or industrial clusters prevail;

4) The regional cluster model differs from the national model in that it covers a separate region. The choice of priority areas of activity is determined by the availability of specific resources, infrastructure, established links and traditions in the production of individual goods. Cluster initiatives mainly come from a group of entrepreneurs, the cluster policy is usually implemented on a "bottom-up" principle. At the regional level government efforts are aimed at supporting and developing cooperation between partners, organizing training programmes and public relations, training top managers to manage clusters.

Partnership is the main principle of cluster development in the EU, its main types are joint business networks with partners; cooperation networks involving cluster entities as well as facilitating organizations and authorities; public-private partnerships; inter-cluster networks beyond national borders.

Based on the experience of the EU countries, it is reasonable to use the following models of cluster formation in relation to the Republic of Belarus:

– model of transnational clusters (within the framework of the EAEC) - clusters of information and communication technologies, pharmaceuticals, eco-technologies and ecotourism;

– transboundary cluster model (within the EAEC and with the EU countries) - petrochemical, biotechnological, construction materials, automotive, metallurgical, tourist, etc. clusters;

– national cluster model - clusters of woodworking, petrochemical, foodstuffs, machine-building and metalworking, science

and high technologies, culture and art, transport and logistics, etc.;

– regional cluster model - depending on the profile and specialization of regions.

The mechanism of cluster creation we propose includes two blocks: organizational and economic [5].

The organizational block is a set of elements that determine the direction of the cluster development.

The economic block is a set of elements that can create favourable and effective conditions for the development of the cluster participants.

The organizational block includes the following elements:

1) legal regulation of creation and functioning of the cluster - the initiator and the main driving force for the creation of the cluster are regional government bodies that form the legal framework, cluster policy of the region, coordinate the creation and development of the cluster in the framework of socio-economic development of the region; the peculiarity of creating a cross-border cluster is the need to harmonize cluster initiatives of the cluster member countries;

2) staffing and scientific support for cluster participants - providing scientific support for the creation of the cluster and cluster projects at the level of business plans;

3) monitoring and information support of the cluster - assessment of economic potential of the region, identification of factors hindering its development, assessment of priority areas of development, informing stakeholders and infrastructure organizations about the creation and conditions for participation in the cluster activities and attracting them to cluster initiatives;

4) the creation of a working group and cluster management bodies (coordination council) - organize the work at the initial stage of the creation of a cluster to develop priorities for development and identify a set of effective cluster projects.

The economic block of the cluster creation mechanism includes the following elements:

1) evaluation of economic potential - analysis of available material, technical and economic resources, analysis of needs for the creation of new products;

2) measures of state support, including preferential taxation - possibility of participation of cluster participants in grant support; provision of subsidies for the development of objects of cluster participants and objects of cluster infrastructure; reduction of tax rates depending on the criteria established to support cluster initiatives;

3) credit policy – the development of credit products for cluster participants with state support;

4) investment attraction – the formation of a cluster allows accumulating resources of cluster participants, which increases their investment attractiveness. The development of a cluster creates favourable conditions for attracting investments due to advantageous terms of transactions between cluster participants, cost reduction and other economic advantages;

5) market regulation – satisfaction of consumers' demand, the establishment of discounts on resources consumed;

6) the development of international economic relations.

One of the mechanisms on which the success of cluster structures depends is financial, while the principles of formation and allocation of investment resources play a primary role [6]. Based on the experience of the EU countries, in particular, Poland, it has been established that, firstly, the process of diversification of funding sources is launched over time in the state-subsidized cluster initiatives, secondly, in the leading European states the financial burden is shifted to the regional level and extra budgetary sources, and thirdly, the most effective, from the point of view of implementation of innovative projects, are clusters that use mixed funding, including a new tool for financing innovations - crowdfunding [7].

Efficient interaction between organizational and economic blocks allows the process of creating a cluster to resist the impact of negative factors.

The organizational and economic mechanism can be complemented by the process of self-organization of territories, which is one of the ways of possible development and takes into account practical experience. The process of self-organization does not take place automatically; this requires administrative and managerial impact or personal initiative of the participants in the self-organization. As a result of self-organization, new, more sustainable forms of development emerge through the interrelation of different activities.

It is necessary to note an important role of higher educational institutions in cluster formations and innovation system as a whole. The presence of a scientific and educational centre in the cluster system creates another

source of competitive advantages - activation of innovation development through access to the common fund of technical knowledge, joint development, education and training of employees and managers.

In practice, the educational sector of the cluster is represented by several educational institutions, as the activities of the cluster require continuous training of specialists at different levels.

The specifics of the educational sector are that the training of students is mainly in the interests of the cluster. The university acts as an equal participant in the innovation cluster, as its market potential, role and importance for the development of a particular region and, consequently, the cluster, is difficult to overestimate. The main advantages and benefits of the university's participation in the innovation cluster are as follows:

- simplified access of young people in the region to higher vocational education, which means improved quality of human capital in the region;
- an influx of young people from other regions into the region, which means an increase in the number of young (and, therefore, energetic) economically active people;
- additional financial resources coming into the region, especially for regions with strong universities;
- the training of specialists needed in the region. It is easier for the regional authorities to negotiate with "their" university than with one located in another region;
- the research potential of the university is realized primarily in the region of location, which has a beneficial effect on the innovation climate in the region;
- the impact of the university on the cultural situation in the region;
- a modern university is potentially a regional centre of innovation, for example, through the creation of small innovative enterprises, contractual research work, etc.;
- potentially, the university can also act as a centre for entrepreneurship development in the region, since, on the one hand, it has a significant number of young, well-educated personnel, who have received modern education and are fully integrated into the market and market economy conditions. On the other hand, the university may act as a centre for retraining and qualification upgrading of the population, as well as an organizer and manager of the system of additional professional education (short-term courses, faculties of additional professions, etc.);
- for the region the university can play the role of a moderator of relations with foreign countries, a kind of PR-project that enhances the image of the region at the national and international levels, thus attracting investors' attention to the region.

Conclusion. The conceptual approaches to the creation and development of clusters described in the article are implemented by Polessky State University in the framework of the Innovation and Industrial Cluster in the field of biotechnology and “green economy”, and the process of formation of a cross-border cluster based on scientific cooperation with the WSB University (Gdansk, Poland) is going on. Scientific seminars on the potential of economic cooperation between Belarus and Poland are regularly held, there the discussion in small groups identifies areas for joint scientific research and monitors the progress of their implementation. A project of the Research and Education Centre has been prepared to intensify cooperation between the universities. Two business forums have been held (2018, 2019) with the participation of representatives of the Polish cluster "North-South". A Memorandum on cooperation has been signed by clusters of Belarus (Innovative Industrial Cluster in the field of biotechnology and "green economy", created on the basis of PolesSU) , Poland (Transport and Logistics Cluster "North-South", Research Cluster "Internet of Things"), Georgia (Tourist Cluster), Moldova (Energy and Biomass Cluster), Ukraine (Pre-Carpathian Eco-Energy Cluster, Association of Industrial Automation of Ukraine), Romania (Green Energy Cluster, Mechanical Engineering Cluster). In 2018, the Innovative Industrial Cluster in the field of biotechnology and "green economy" received official registration on the EU cluster platform (https:// www. clustercollaboration.eu/cluster-organisations/innovative-and-industrial-cluster-field-biotechnologies).

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