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IMPROVEMENT OF RUSSIAN CLUSTER POLICIES BASED ON FOREIGN EXPERIENCE

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Abstract

The study aims at revealing both real and probable problems to be faced by clusters in Russia and at proposing certain solutions to those as components of cluster policies. The paper studies interaction of enterprises and their conglomerates – clusters – and the state at the stage of current development of the Russian economy. It analyses the factors of cluster efficiency, their positive influence on the enterprise activity, intellectual potential of the employees and the national economy. The illustrations provide a detailed description of the cluster's life-cycle and conditions for its successful growth are enumerated. The paper provides a detailed account of operation and experiences of foreign successful clusters. It also determines preconditions required to make St. Petersburg a territory to become one of leaders both in number and in quality of cluster projects implemented. Based on these, the paper offers a set of guidelines to support cluster at the national level. The efficiency of the guidelines proposed presumes a systemic approach to cluster development and eliminating high levels of bureaucratization in the Russian economy. An essential element in this approach is optimized allocation of human resources with an emphasis on tacit knowledge. Clusters are regarded unique in terms of being established as a result of natural and objective processes and independent of government decisions. Clusters are also a peculiar tool of market economy and thus are to be valued highly in terms of national economy. The role of the state is to provide such initiatives with the necessary standards and recommendations.

Keywords: Cluster, cluster policy, production organization, manufacturing cycle, tacit knowledge, human potential.

1. Introduction

Accelerating digitization of economy, increased competitiveness in all areas of modern life and development of the world economy necessitate new principles of production organization. In such conditions clusters as a form of cooperative activity can be regarded a model capable of a breakthrough. Experience of developed countries proves implementation of well-designed cluster policy to be one of most effective tools to promote national economic growth. First, cluster development allows increased labor productivity rates creating incentives for innovation and simplifying sharing knowledge and experience with leading foreign producers while drawing most qualified and experienced personnel. Second, emergence and development of clusters provides the basis for solving certain problems resulting from short-sighted political and economic decisions and the recessionary conditions in the nation's economy.

2. Problem Statement

Development of clusters began to be discussed in 1990s, however, they have a much longer history. As early as in 1890s Alfred Marshall described them as a way of business coexistence and survival. Another important contribution to theory of clusters was made by a prominent Russian economic geographer Nikolay Kolosovsky, one of the fathers of territorial economics. He aspired to elaborate the schemes of district-based manufacturing complexes to most efficiently use both the local nature wealth and landscapes while being built into the already existing manufacturing chains. It is noteworthy that when translated into English Kolosovsky's ideas found enthusiastic advocates in the USA.

One of the examples of Kolosovsky's theories realization was Pikalyovo territory in the Leningrad region, Russia's north-west, with its manufacturing chain. Apatit JSC, Murmansk region, supplied minerals (nepheline) to BaselCement Pikalyovo (now Pikalyovo alumina refinery, LLC Pykalyovsky Glinozyomny Zavod) which, in its turn, supplied its products of refining, belite sludge and limestone, to Pikalyovo Cement (Pikalyovsky Cement CJSC) and sodium carbonate solutions to Metachem LLC (Metahim Group). The chain was characterized as highly efficient at the times of the planned economy, with transition to the market economy, however, the levels of trust with separated private owners were extremely low, each prioritizing their own business interests and considering the overall efficiency and operation of the whole chain of minor importance. 2007 saw restructuring and repurposing of Basel Cement Pikalyovo which resulted in disrupting the manufacturing chain (Vermishev, 2019). It is obvious that clusters in Russia are a new phenomenon, and their development requires special support measures.

3. Research Questions

The main questions that arise from the problem discussed in the article are: what are the reasons for the success of developed clusters; what are the main trends in cluster policy in developed countries; what should Russia do to support its clusters.

The example above demonstrates the acute need for continuous information sharing and presence of shared business interests within a cluster if it is to operate effectively and efficiently. Based on the above we may suppose that current-day reality necessitates continuous communication among all those to be, at least potentially, involved in the cluster if approached broadly – all types of enterprises and organizations

(innovative and manufacturing), higher educational and professional training establishment, developers and IT companies.

It is the continuous information sharing which is regarded obligatory for quick and effective search for orders and launch of new products which will be of high demand in the market. It is specifically a task to be solved by a cluster structure as presented in Figure 1.
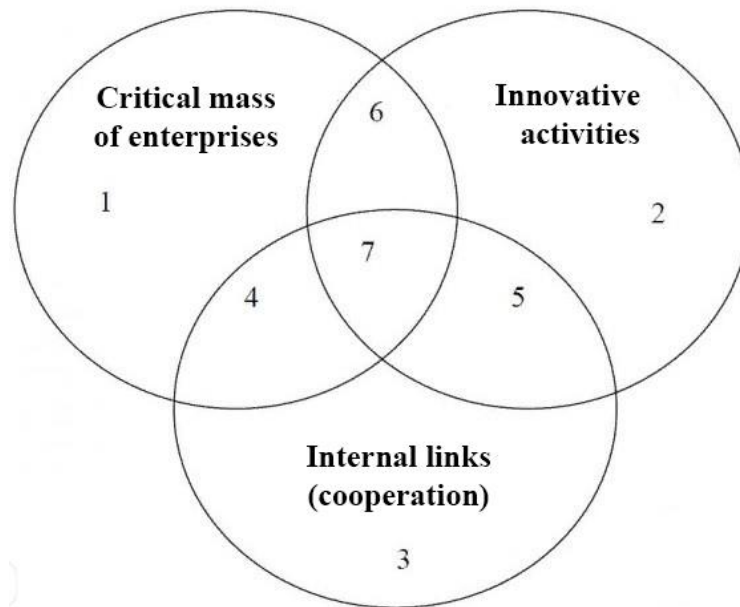
Figure 01. Combination of cluster specific features (Kotlyarova, 2012)

Cluster is characterized by the combination of the three features as given above (Area 7). Inclusion in Area 1 indicates high concentration of enterprises and organization belonging to the similar sector or involved in various stages of one activity but having neither connections between them, nor ongoing innovative activities. Such condition produces the phenomenon of a company town with a single big enterprise determining the activities in the area, employment and the basis for the community existence.

Area 2 is characterized by single innovative enterprises in activities which are, at least at that stage of cluster development, not common in the district. Hence, considering such enterprises as point of growth is too bold, at this stage, due to insufficient experience of the enterprise operation in the market conditions.

An example of enterprises with a certain – sometimes quite high – degree of linkage among them (Area 3) with concentration bringing no relevant economic effect in terms of efficiency and innovative activities is associations of small and medium-size businesses in crafts and various household services which provide little opportunity of forming clusters.

Areas 4, 5 and 6 are characterized by presence of two of the three features required to form a cluster. Groups of organizations, for which this condition holds, are typically termed potential clusters, or proto-clusters.

Proto-cluster (potential cluster) is an agglomerate of enterprises and organization possessing any two of the three cluster specific features (Kotlyarova, 2012).

A typical cluster life-cycle is presented in Figure 2.

| Agglomeration | Emerging cluster | Spin-off cluster | Mature cluster | Transformation |
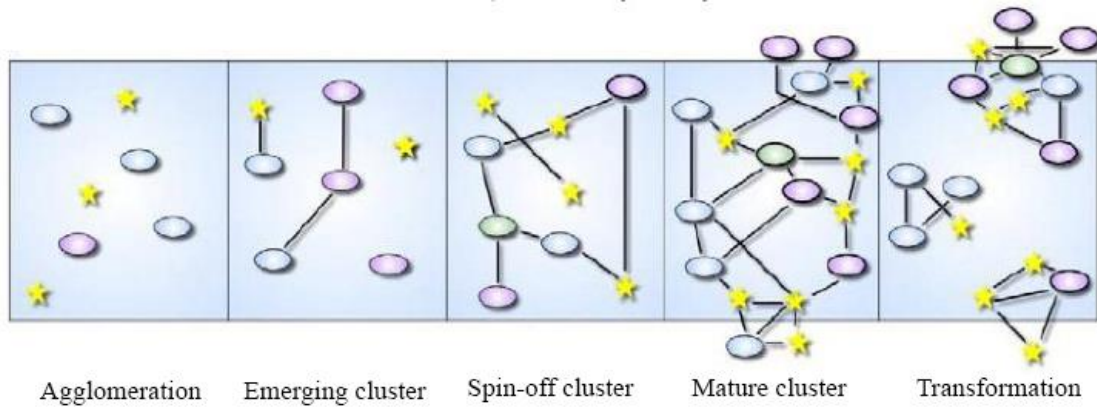
Figure 02. Cluster life-cycle by Stolypin Growth Economy Institute (2019)

At the final stage transformation induced by new technologies results in changes in the market condition, production processes etc. Cluster can undergo radical changes in their structure including formation of new separate clusters.

Yevgenia Shamis, founder and CEO of Sherpa S Pro research and consulting company, identifies the following reasons to have affected the urgency and the trends of cluster formation:

- globalization and resulting less competitive advantages for the district-based manufacturing chains;
- higher rates of population mobility (researchers tend to be attracted to research centers offering more opportunities and more interesting challenges);
- increased degrees of specialization (Vermishev, 2019).

4. Purpose of the Study

The study needs to define problems that Russian clusters can face and to offer possible solutions to form and to improve cluster policy.

During the whole 2010s Russia has been active in developing new forms of district-based organization in production and manufacturing in particular and in entrepreneurial activities in general.

The main feature of inter-industry cluster is in diverse competences and qualifications, continuous sharing of ideas and expertise among professionals and experts in various fields. Interaction of businesses and organizations linked and engaged in various types of business activities while capable of joining into a single manufacturing chain – starting with a creative agency and design bureau and finishing with an exporter company – produces an effect of synergy multiplying the potential of each link in the chain.

Timur Bronnitsky, the Director of the Department of Strategic Development, Monitoring and Evaluation of the Russian Ministry of Science and Higher Education, emphasizes the strongest need for clusters in terms of region development and well-being and calls the government to satisfy this need. Certain inconsistence, however, can be noted in the local approaches and trends in cluster development. On the one hand, regions and districts demand 'certain scope of powers and authority in research and technologies'; on the other hand, too seldom regional and district authorities are efficient in interaction with clusters and

control the effects of cluster operation on the local economy. This condition requires a more rational approach to setting goals in planning for measures and actions in technological research and development and their implementing. Clusters are a highly promising instrument for economic development of regions and territories the application of which is to be weighed against the specific conditions of each territory. This procedure allows establishing a system of targeted measures and planned actions and activities to support and regulate cluster development.

Vitaly Hotsenko, the Director of the Department of Regional Industrial Policy and Project Management of the Ministry of Industry and Trade of the Russian Federation, emphasizes the targeted establishment and development of clusters. The Ministry regards clusters as 'a chain of producers providing end-products which is to close into a loop' and as units to create continuous demand. In addition, the Ministry plans to reform the program of support for industrial cluster development channeling it primarily to stimulate production required for national projects. The demand for such products is estimated by the Ministry as the total amount of 6.2 trillion RUB, with current capacities of Russia-based industrial production to provide for as much as 3.2 trillion RUB.

Hence, tax benefits can be regarded an effective measure to support cluster development. Increases in enterprises' equities will allow increased investments in production facilities thus stimulating restructuring and modernization of facilities already in operation.

The data collected by the Cluster Observatory at the Institute for Statistical Studies and Economics of Knowledge (ISSEK) of Russian Higher School of Economics (HSE) reveal an increase, as of 2018, in the number of cluster projects requiring widening of industrial partnerships. Examples of such clusters are the Technological Valley at the Lomonosov Moscow State University, educational telecommunication networks, national technological initiatives (Strokov, 2020).

Experience proves the necessity for business enterprises and educational establishments to cooperate if efficient operation of clusters is to be secured. Experts claim the existing educational standards are to be revised, specialized training programs based on specific demands of certain enterprises is to be introduced and wider options for student internship at various enterprises are to be offered. The existing system of higher education in Russia suffers from lack of practical experience and targeted training of human resources for individual industries and enterprises which is to be given emphasis in the nearest future.

5. Research Methods

Foreign cluster policies are oriented primarily at increasing the competitive advantages of regions. Successful policies and implementations are characterized by high rates of interdepartmental cooperation, careful selection of prioritized areas for cluster projects and elimination of geographical barriers for the enterprises within a cluster. By analyzing such positive experiences Russia can promote increases in competitive advantage for domestic products in the global markets by securing, among other measures, demand for such products in the domestic market. One of possible steps here is to raise the levels of concentration and localization of production facilities for domestic production within the territory of the Russian Federation which is to become an element of revised cluster policies mechanisms.

Foreign cluster policies also reveal a trend for the mapping of innovative projects to be dependent, in terms of high concentrations of intellectual resources, on certain territorial units (regions, sometimes cities). It is widely held most of US-based research and development to be concentrated in five districts.

What are the reasons for such differentiation? To a large extent the efficiency and productive potential of a region are determined by the coordinated effort of various territories supported by the efficiency in allocation of human resources. In other words, clusters emerge naturally in those districts which are characterized by interrelated diversity of economic agents and the resources and components required for production processes. This interrelation of economic agents can be described as a combination of cooperation and competition as entities in a cluster are both to establish cooperative relations with other entities and to compete with them for human resources, innovations and consumers.

Affected by a variety of factors clusters seldom follow a universal pattern. Certain propositions, however, can be offered for constructing an algorithm of successful cluster development.

The most widely known examples of highly effective and successful clusters are Hollywood and the Silicon Valley in the USA. The former owes much of its success to favorable climatic conditions and diversity of landscapes; the latter, to closeness, in terms of distance, to a major concentration of knowledge and intelligence, the Stanford University. At least one crucial factor is present in both – highly concentrated intellectual and creative potential with an easy access to educational resources and expertise. A point in time when the mass of innovative ideas becomes critical is the point when a new cluster emerges.

Cluster phenomenon can be attributed to several factors. The first, and the most obvious, one is the advantage gained from certain geographical conditions. Compact location of enterprises allows for highly concentrated human resources and cooperation in the effort to secure certain benefits and preferences from the local authorities. Suppliers also benefit from compact location of consumers as they can save on logistics delivering large batches of their products to the same locality.

The second factor is the so-called tacit knowledge, experience, skills and expertise. These are often gained at work and sharing proceeds naturally in a relaxed atmosphere of the working environment. Such environment also promotes innovations and breakthroughs, which is another factor affecting the effectiveness and efficiency of clusters.

Finally, the third factor is competition, which, in this case, drives other entities within a cluster to raise the levels of productivity and efficiency once one of the entities within this cluster has become more successful. This arrangement proves most effective when entities of a cluster enter international markets. Having gained experience in competition within the cluster, such entities are extremely efficient in winning and securing shares in new markets (Vermishev, 2019).

From the above, the three basic features of cluster support policies in foreign countries can be determined. The first one is an indicator of the maximum level of support for one cluster project. In some countries, Austria, for instance, no maximum level is set, while other countries set it at the level of 1 to 40 million euro (1 million euro in Denmark, 40 million euro in Germany, 5 million euro in France). The second feature is structure of cluster funding. In most countries it can be characterized as complex combining funding from regional public funds, the European Regional Development Fund and private investors in a variety of patterns. Finally, the third feature of cluster policies in European countries is long-term support

for cluster projects. Development of clusters is supported for a number of years: 4 years in Denmark, 3 years in Czech Republic, 5 years in France, 4 years in Latvia and unlimited number of years in Greece.

Turkey can be regarded a noteworthy example in terms of cluster support policies. The term for supporting cluster projects in Turkey is set for the period of 3 to 5 years, and the principal form of funding is grants, the share of which in the cluster budget can make 75% to 90%.

Based on the data collected for the Russian Federation, Kutsenko (2009), Head of the Cluster Observatory at ISSEK, notes the emergence and development of cluster projects to be tied to region obtaining funding and support from the state. Crucial to cluster functioning and survival, however, seems their becoming profit-making units.

If viewed as a complex of a few production sites, clusters have certain advantages for each:

- higher effectiveness in raising funds from outside investors;
- products with higher rates of customer satisfaction;
- easy entrance into markets;
- suppliers who account for the specific industry-related structure of a cluster.

Programs for cluster support in the Russian Federation historically tend to rely heavily on certain ministries and government agencies with their established procedures and traditions, which condition is bound to affect the cluster development and configuration. This condition also impedes changes based on the experiences accumulated and hence qualitatively new stages in evolution of the cluster support programs. A new trend is already identifiable in relation of cluster development, which is an increase in the number and variability of leaders in clusters – local authorities and business are more and more often added by universities and research organizations (Russian cluster observatory, 2020).

The study employs theoretical methods of abstraction, synthesis, analysis, and generalization. The examples of both foreign and St. Petersburg-based clusters allowed defining the principles of cluster policies and determining effective ways to support cluster development.

6. Findings

St. Petersburg already has over a dozen of clusters. Approximately the same number of proto-clusters have already emerged – which means they have been established but their recognition and registration as clusters is still an ongoing process, states Alexander Khodachek, the President of HSE in St. Petersburg. He argues they are clusters in shipbuilding, fashion industry, health and wellness resorts in 'Kurortny' [resort] district of St. Petersburg, and enterprises related to exploration and development of the Arctic regions with substantial potential for innovation.

Another important consideration is high concentration of intellectual and professional human capital in St. Petersburg with great numbers of various educational establishments: schools, universities and institutes, colleges and schools for vocational training, centers and facilities for retraining and additional training, improving qualifications etc. covering training and education in the fields related to the above areas and considered most essential in terms of both employment opportunities and regional development.

The only feature which is lacking is the absence of officially recognized clusters, which, given the conditions of a mega polis, will promote innovative development of both the city and the region.

The Program of Development of Industry, Innovative Activity and Agricultural and Industrial Complex in Saint Petersburg targeted a 40% increase in innovative products output in the period of 2014 to 2020, the increase already achieved by late 2017.

Khodachek argues innovations to have always been in demand in the military and defense industry (membrane fabrics, for instance, initially used in military production and extremely popular later in production of sportswear). Currently most highly demanded technological innovations are in the areas related to development of the Arctic regions.

In December 2019 in the town of Pevek, Chukotka autonomous district, first in the world floating nuclear power plant Mikhail Lomonosov started its operation. In the current 2020 it is to be connected with Pevek system of heating and begin supplying Pevek housing and infrastructure with hot water (RIA News, 2019). Such capital-intensive and promising project requires most advanced technologies to operate at full capacity.

Experts in energy sector believe floating nuclear power plants to possess high export potential, which means orders for new types of power plans are to be awaited. Manufacturing and construction of such plants will require operation of every link in manufacturing chain – from Rosatom enterprises and shipbuilding companies to mining, mineral extraction and processing of metal ores. It can well be cited as an illustration of cluster emergency which is both natural and determined by the very nature of economic relations.

The last aspect of cluster organization and functioning to be discusses is its localization. When cluster declines and collapses the economy of locality, in the absence of diversification, can collapse as well. It is for this reason that some experts call authorities, in addition to supporting cluster development, pay considerable attention to promoting diversification in the economy of a region or a district (Vertakova, 2016). In interaction of a cluster and a region both administrative and industry lines appear blurred.

It also should be noted that each cluster is characterized by certain specific features. Among those the following ones can be identified: the necessity for sharing information with firms or other clusters, or preferential forums for communication and discussion, either through online channels, or in the course of personal meetings. Hence, it can be stated that cluster will be guaranteed qualitative development only when all its needs and unique features are addressed carefully and targeted support is offered (Vermishev, 2019).

7. Conclusion

The above allows determining a possible set of principles and measures to support cluster development.

First, state support is to be granted to infrastructural projects implementation of which results in increasing the cluster effectiveness and efficiency, jointly with the cluster support, i.e. by attracting the cluster own funds. In such case the infrastructure established will satisfy the cluster specific needs and demands.

Exemplary of such types of infrastructure projects are engineering centers and recruiting agencies.

Second, intensive growth of funds for development allocated form the enterprise equity capital can be promoted with granting tax benefits. These funds can be allocated to modernization, renovation and re-equipment of the company's fixed assets. A set of measures and steps in each case is to be determined by the facilities to be modernized and the type of industry.

Third, positive influence on economic activity of a developing cluster is to be rendered by minimization or elimination of the administrative barriers. In this respect most effective are the so-called regulatory sandboxes which allow optimizing cluster entities expenses and accelerating the process of innovations integration. The phenomenon of regulatory sandboxes is based on a special experimental legal environment which allows for legal entities developing innovative financial products and services to conduct certain experiments within a selected (also called pilot) territory on integration of innovations and launching innovative products without a risk to be prosecuted for breaking existing laws (FCA, 2015). The idea here is to eliminate the effects of a number of legal requirements to businesses (prohibitions, restrictions, conditions, other requirements) if a business is set within a sandbox. The set of regulations to be excluded is typically determined by the type of economic activity the business is engaged in, and economic activity is assessed both in terms of its individual stages and in terms of the whole production cycle – from farming site to shop counter, or from innovation to servicing the customer). Determining the set of requirements often necessitates the data from the business itself on expenses to comply with regulations, experiences of foreign sandboxes is also to be examined carefully (Shadrin, 2017).

A more detailed description of the third principle implies elaboration of the following items:

- detailed functional flowcharts of the full manufacturing cycle by types of economic activities;
- analysis of current condition with regulation of business operation;
- study of the foreign standards established for regulating economic activity and their application including methods of monitoring and control, system of licensing (Kutsenko, 2009);
- assessing the expenses of entities and clusters in compliance with the standards and regulation in effect in the Russian Federation;
- testing of innovations to be integrated within the objects, territories and areas which are to be granted the right for experimental legal environment;
- inclusion of successfully tested experimental changes (Porter, 1990) into regulations and legislation with simultaneous application of digital technologies within the frameworks of the Digital Economy of the Russian Federation program for Russian economy digitization, for instance, development of a unified state automated information system with control and audit reports, flowcharts of manufacturing cycles, and the requirements related to each stage (Berea & Bucerzan, 2014).

Forth, in implementing cluster policy it is highly expedient to use the potential of higher educational establishments, research institutes and centers which are to provide for:

- development and mastering of new technologies and their application in a variety of industries (Geddes,2005);

- high-quality retraining and qualification improvement programs for enterprises;

- development of managerial competences with heads of enterprises;

- development of human capital and innovative potential region- and nation-wide (Kotlyarova, 2012).

Fifth, financial support for clusters from the state is to be planned and viewed in prospective. Nonrecurring subsidies are characterized as being of low efficiency; support for projects is to be provided for several years as experience of European nations demonstrates. This approach presumes developing a road map of measures and the following monitoring of investment efficiency.

Acknowledgments

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