

Problems and restrictions facing cluster formation within priority social and economic development areas in monotowns

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Abstract—The analysis of territorial development programs for Priority Social and Economic Development Areas (PSEDA) in monotowns shows that some of them are based on the use of the cluster approach to the industry structuring in a town. However, in addition to the possible advantages of using cluster formation within the regions, it is necessary to assess the problems and limitations of creating municipal clusters. Such industrial clusters, emerging and developing in Priority Social and Economic Development Areas (PSEDA) in single-industry towns (i.e. monotowns), face many problems and obstacles. This article presents the results of the study of these problems. Potential risks, problems and limitations facing cluster formation in monotowns were identified not only on the basis of systematization of the existing research in this area, but also as a result of a survey that was answered by the potential participants of clusters in Kemerovo region. The identified problems, risks and limitations that the development of clusters faces while implementing the programs aimed to build PSEDA in monotowns, have been classified by their sources. These sources are determined by the characteristics and unique features of monotowns themselves. They depend on the individual characteristics of a PSEDA, in particular, the requirements for residents and their investment projects. The sources are also determined by the risks and difficulties that exist in the practice of cluster formation and functioning of clusters.

Keywords—cluster formation, cluster, Priority Social and Economic Development Area, monotown, problems and limitations of cluster formation, risks of cluster policy.

I. INTRODUCTION

To diversify the economy of monotowns of the Russian Federation, a state measure is actively used, namely the creation of Priority Social and Economic Development Areas (PSEDA). Some programs for creating PSEDA in monotowns are based on the use of the cluster approach. For example, three industrial clusters are planned to be created in

a monotown of Yurga in Kemerovo region – a cluster for the production of building materials, a machine industry cluster, and an agro-industrial cluster. By the year of 2010 a monotown of Anzhero-Sudzhensk in Kemerovo region is also considering the possibility of creating a petrochemical cluster and a wood processing cluster for the purpose of a PSEDA development. While preparing the application for obtaining the status of Priority Social and Economic Development Area, the management team of a monotown of Berezovskiy in Kemerovo region has also been using the terminology of the cluster approach to specify perspective directions of its development. They are also exploring the potential for creating an oil-and-coal-chemical cluster (Ivanova et al 2017).

By substantiating the possibility to create and successfully develop a cluster, the management team of the monotown of Berezovskiy proceed from the following facts: at present 76% of the town's economy is in coal mining and processing; there is a Federal highway going to the city of Irkutsk near the town, as well as a regional highway to Anzhero-Sudzhensk and Tomsk; the monotown of Berezovskiy has a branch railway line that has an access to the Trans-Siberian railway via the town of Taiga (this is of great strategic importance for the development of the town, since it already resolves the issue of logistics). An assessment of trends in the coal markets shows that thermal coal is losing its consumers in the world market, and metallurgical coal will be in short supply in the nearest 5-10 years. Russia does not dictate prices in the world market (the key players are China, the U.S.A and Australia). To ensure the innovative direction for the newly developing oil-and-coal-and-chemical cluster in the monotown of Berezovskiy in Kemerovo region, a project to create a Center of Research and Competence (WorldSkills Center) has been developed. This WorldSkills Center will be based at the premises of Berezovskiy Polytechnic College, which specializes in laboratory and

chemical analysis, industrial robotics, as well as in mechanics and automation. WorldSkills Center will encompass research laboratories specializing in organic chemistry and coal chemistry, as well as in mineral processing, and robotics and engineering.

Active development of cluster initiatives in the Russian Federation began in the late 2000s (Abashkin et al 2012, Kutsenko 2012, 2015, 2016, Kutsenko and Meissner 2013, Gokhberg and Shadrin 2013, Gokhberg et al 2011, Abashkin et al 2017, Markov et al 2015). Overall, 277 cluster initiatives have been identified in the Russian Federation during the implementation of cluster policy. Some of those clusters have already ceased to exist (170 clusters), while the others continue to function at least since the year of 2008 (61 clusters), yet many (61 clusters) appeared in the period from the year of 2013 to 2015. (Kutsenko et al 2017). In addition, 27 pilot innovative territorial clusters (ITCs) with the budget of more than 5 billion rubles were selected on a competitive basis to participate in a support program. This program is being implemented by the Ministry of Economic Development of the Russian Federation since 2012. It contributes to the growth of economic development of the regions where the clusters are located (Islankina et al 2017). Pilot ITCs showed positive dynamics of the most important targeted performance indicators: cluster member-companies either created new or updated more than 95 thousand high-performance work spaces; total investment in the development of clusters from extra-budget funds amounted to more than 360 billion rubles; total cost of cooperative research projects reached 75 billion rubles.

Such dynamics of cluster development surely results in the increase of interest, including the interest of the developers of the programs aimed at creating PSEDA in monotowns. They tend to use the terminology and tools of the cluster approach in describing the goals and mechanisms for achieving their program goals. However, the problem remains whether it is possible to use the cluster approach in combination with the mechanisms of PSEDA to address social and economic problems, and to diversify the economy of monotowns. Another issue is whether the writers of development programs for PSEDA in monotowns objectively consider the prospects of attracting investors and residents when basing their decisions on the advantages of cluster formation in the industry that exists in those areas. The study of this problem and search for ways to solve it does not really require an analysis of benefits from the use of clusters in PSEDA in monotowns. Instead, it mainly needs to identify and analyze, and systematize any potential obstacles, problems and limitations that hinder the process of creating and developing municipal industrial clusters in monotowns in the framework of the strategy to create PSEDA.

II. METHODS OF RESEARCH

The objects of the research presented in this article are as follows: problems facing monotowns; characteristics and particular features of PSEDA in monotowns that affect successful and sustainable development of clusters on their territories; problems, limitations and risks facing clusterization in PSEDA of monotowns; the experience of cluster initiatives' origin and development; the practice of clusters functioning in the Russian Federation and abroad;

interests and fears of investors, as well as potential and existing residents of PSEDA, who participate in clusters in those areas in their monotowns; and the experience of clusterization in the industry.

This research was based on the following information sources: studies of foreign and domestic experience in the development of clusters; foreign experience of cluster management European Cluster Excellence Initiative; processes of creating business clusters and high-tech clusters; the criteria for selecting pilot clusters in Russia; officially published statistics on functioning and support of clusters, as well as on the creation and work of PSEDA in the Russian Federation; work of monotowns and implementation of various instruments for diversifying their economies; empirical data collected through questions, surveys and interviews of actual and potential residents of PSEDA and potential cluster members in the monotowns of Anzhero-Sudzhensk and Yurga in Kemerovo region.

The methodology of our research is based on a successful and effective for scientific research, in our opinion, the methodological approach used in the work by M. Russ (Russ 2016). The essence of this methodology is to conduct an integrative literature review using screening when searching for keywords in headlines and abstracts. Proposed by Russ M. a descriptive multidisciplinary review of the literature as a modified version of the integrative review of the literature makes it possible to use the initial conceptualization leading to a new perspective on the studied problem – the identification and systematization of the problems and limitations of clustering on PSEDA of monotowns. The use of ontology as a specification of conceptualization, a tool for structuring information, a system of a set of concepts and a set of statements about these concepts allowed us to form an idea of research in the cluster sphere conducted by Russian and foreign researchers. The study was conducted during 2017. The following keywords were used (in various combinations): cluster, cluster initiative, cluster policy, company town, PSEDA, special economic zones, cluster formation risks, investor, resident, cluster approach, socio-economic problems of single-industry areas, company towns, PSEDA in company towns, restrictions and risks of cluster formation on PSEDA of monotowns, interests and concerns of investors, experience of clustering in industry, factors of successful development of the municipal cluster, etc. Since narrative and selected literature reviews have limitations, marked, in particular, in to identify and systematize the problems and limitations of clustering on PSEDA of monotowns, an analysis of economic and business literature, a survey of entrepreneurs, managers and employees of enterprises was carried out in order to study the interest of entrepreneurs, business representatives in obtaining the status of PSEDA, as well as a member of the cluster on PSEDA of monotowns. In Kemerovo region in 2017, the questionnaire was sent to 450 enterprises operating in various fields, independent and branches of large companies. Interest was shown by 52 organizations with different industry affiliations, number of staff, period of work. The results of the survey of entrepreneurs of the Kemerovo region were compared with the results of a similar survey in the Samara region (Reshenie vernoe 2017).

III. RESULTS AND DISCUSSION

While analyzing the problems and limitations of cluster formation in Priority Social and Economic Development Areas (PSEDAs) in monotowns, it is necessary to consider their three sources:

- 1) they are determined by features and special characteristics of the monotowns themselves;
- 2) they depend on the specific features and special characteristics of PSEDAs, in particular, the requirements for residents and their investment projects;
- 3) they are determined by the risks and difficulties connected with cluster formation and functioning of clusters.

In addition, we believe that when one is identifying and describing the strength and intensity of the limitations facing cluster formation in PSEDAs of monotowns, they should consider the dichotomy of the possibility (or impossibility) of cluster formation in PSEDAs of monotowns: the factor of successful sustainable development of a municipal cluster is the limitation (or risk) facing the process of formation of a municipal cluster and its successful development. Factors of successful sustainable development of a municipal cluster include:

- 1) Status of infrastructure development of the territory (transport, energy, engineering, housing and social infrastructure);
- 2) Status of productive capacity development;
- 3) Critical mass of participants, i.e. companies that work in core business, and carry out related and supportive activities;
- 4) A high proportion of small and medium size businesses in the cluster. It is important to have small and medium-sized companies with a higher innovation level of their production process;
- 5) Scientific and technological, and educational potential of the town;
- 6) Attractiveness of the territory to qualified personnel and representatives of creative industries;
- 7) Conditions for the development of a strong internal competition;
- 8) Management quality;
- 9) Balanced composition of the cluster's governance board; overall representation of all cluster participants, including small and medium size business; formal procedures and criteria for selecting projects, as well as for entering and leaving the cluster; availability of a code (a set of rules) that governs the interaction between cluster members;
- 10) Horizontal nature of the partnership within the cluster; the development strategy of a cluster as a vision of the future agreed upon by all the cluster participants; all the cluster participants, including small and medium-sized companies, have equal

decision-making rights on the strategy for the cluster's development;

- 11) Adherence to the cluster strategy of open innovation; focus on structural changes; creation of new industries through the formation of additional value chains by attracting new participants into the cluster; creation of small innovative firms around large enterprises - members of the cluster;
- 12) The level of networking and cooperation; *strength and quality* of communications between organizations and individuals representing different organizations;
- 13) Openness of the cluster, including the possibility of feedback from real and potential participants, investors, and subjects of innovation infrastructure.

In this article, we consider the limitations and difficulties of using the cluster approach to the development of PSEDAs in monotowns, which exist due to the problems of the monotowns themselves.

A monotown is defined as a special kind of a settlement. These special features are reflected both – in the definition and in the problems inherent to it. Specific nature of a concept of a “monotown” is in the terminological apparatus, and in the criteria for the allocation of monotowns, as well as in social and industrial complex of a monotown, and in the interconnection and interdependence of problems characterizing the economy of a monotown (Ivanova et al 2016).

The specific problems of monotowns arise due to the complexity and “a multi-layer character” of their formation. Monotowns are often incidental to the problems of municipal administration. The first in the list of those problems is the problem that arises due to inadequate elaboration by local authorities of the mechanism for regulating the activity of industrial companies. This problem can be paraphrased like this: the problem concerns the organization of interaction with economic entities, as well as the organization of participation of all subjects of economic activity in the program of development of the municipality. As shown by the analysis of the situation in single-industry towns, the current state of the industry often has negative trends. A timely and adequate response to those trends depends on the justified choice that needs to be made by the local self-government authorities of directions of the development of their town and its core industry. The industrial policy with progressive goals meets difficulties in the process of its implementation if there are discrepancies in the chosen types of regulation.

Another problem of municipal managing of a monotown is the problem of coordination of priorities and target settings of development at the level of the region and municipalities. Successful development of both municipalities and the region as a whole is possible only if its priorities and attitudes are consistent with what is happening at the regional level of government, as well as in the neighboring regions, and at the level of the Federation (Karayeva 2017). Strategies or concepts for the strategic development of the Russian regions are often to a small extent linked to similar documents written at the municipal level, i.e. they do not contain a “municipal angle”.

In addition, despite the fact that the municipalities manage to master strategic planning and control over the territorial development, there are still problems with the development and implementation of strategic development plans. These problems arise due to the lack of understanding of the essence of strategic planning and systematic approach to development. Analysis of the documents describing the strategic development of a number of municipalities shows that the documents often differ drastically from each other both in their structure and their content - the authors put different meanings to identical or similar concepts. Documents that are supposed to characterize strategic development of municipalities, in fact, do not do that at all, since they do not take into account dynamically changing environmental conditions; at best they implement the idea of long-term planning. Writers of such documents do not take into account any results of a comprehensive analysis of internal laws, starting conditions and initial prerequisites, or external factors of long-term socio-economic development of territories. The so called "strategic documents" often do not contain any quantified goals (the words "increase", "ensure" and "achieve" do not denote goals, as they are only target settings). Some situations arise when newly defined choice of a strategy, if it is defined at all, preserves the present situation for a strategic perspective, and, as a rule, there are no proposals or analysis of possible scenarios or development plans that would depend on some or other conditions (Ivanova 2017).

The problem with managing the development of monotowns lies in the fact that municipal management teams do not have any principles of project generation. Such principles would have simultaneously helped to solve socially important tasks, to attract extra-budgetary investments, and to create new renewable sources of budget payments for the development of the resource base for territorial management. The analysis of the problems of project implementation showed that complex barriers arise at the project definition phase while determining the sources of resource provision.

One of the important elements of the socio-productive complex of a monotown is a company. Since a company's success directly affects the quality and standard of living of the population, as well as the ability to replenish the city budget, et. al., so, when identifying problems and limitations facing cluster formation in monotowns, it makes sense to analyze the problems of functioning and development of industrial companies in a monotown. Very often it is difficult to call the state of a company based in a monotown satisfactory. Meanwhile, the level of the development of a socio-production complex in monotowns first and foremost depends on the ability of companies to make competitive goods that would meet the market needs.

Analysis of the problems of city-forming companies in monotowns allowed to identify the following problems that affect the possibility of origin and success of cluster initiatives. First, there is a problem of deterioration of production assets of core companies. This problem is complicated by the fact that there is not enough withdrawing of the deteriorated facilities and putting in use of the new ones. This happens due to the difficulties in attracting investments to upgrade the equipment. If the initial conditions applied to the companies-competitors are unequal

while financing most of the facilities in the housing and utility sector (which are put on the balance sheet of both - a municipality and the town-forming company), and if municipalities do not have enough money in their budget, then the town-forming companies are characterized by a high risk of investment. In the second place there is a problem of the quality of management of the town-forming companies. It turned out that town-forming companies were less flexible when laying off their work force, and thus they continue to experience the excess of employees. The third problem facing the town-forming companies is their lack of competitiveness. In addition, town-forming companies in monotowns usually have great difficulties in attracting qualified personnel, as well as the use of outsourcing their services when giving a part of their workload to specialized firms. As a rule, this is explained by the fact that such companies and towns are located far from the centers of labor concentration and cultural centers. That is why highly qualified personnel simply do not go there, and middle class, in addition to a high salary, wants some extra externalities of a city life. The fifth specific problem of town-forming companies in monotowns is extremely bad production infrastructure (e.g. slow development of communication lines).

IV. CONCLUSION

The conducted research made it possible to identify a number of problems and limitations of cluster formation in Priority Social and Economic Development Areas (PSEDAs) of monotowns.

It had been determined that, on the one hand, a pronounced specialization of a monotown can guarantee a significant potential for the creation and development of clusters. It is explained by the high concentration of companies working in the same industry in such populated areas, as well as by the potential development of competition within a cluster. However, there is a risk that the number of small and medium size companies within the cluster will be small. In addition, if the specialization of monotowns is not driven by either science or high technology, the attractiveness of such territory to highly qualified specialists and representatives of creative industries is achieved to a small extent. There is a likelihood of the risk that specializing in one industry companies might be less interested in following the cluster strategy of open innovation and striving for structural changes, as well as for development of new industries by creating additional value chains via attracting new participants of a cluster.

The difficult economic situation in the towns determines the effect of limitations and problems that counteract the process of cluster formation, mainly: weak development of infrastructure and business potential, and unattractiveness of the territory for qualified personnel and representatives of creative industries. It should be noted though that more prosperous monotowns in some regions are characterized by specializing in the industries that differ from the "core" specialization of the monotowns in this region. For example, iron-and-steel industry and nonferrous-metals industry are dominating in most of the "steady" monotowns in Kemerovo and Sverdlovsk regions (Review of Russian Monotowns 2017), and nuclear industry in Chelyabinsk region.

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