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Formation and development of clusters in Russian regions: key issues and solutions (Republic of Bashkortostan)

The paper gives substantiation for the implementation of cluster policy in Russia as the key way of increasing the competitiveness of the country. The analysis of foreign and domestic experience of cluster formation was carried out. The concept of cluster supporting framework of the regions of Russia, considering clusters as a node element of the economy and promoting the binding of disparate elements of economic space, is proposed. The algorithm for implementation of cluster policy in the regions of Russia is proposed. The experience of its practical implementation in the Republic of Bashkortostan is given.

Competitiveness, cluster, competitive advantages, potential clustering of regional economy, tools for clustering.

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The problem of formation and development of clusters in the regions of Russia is still very relevant, because of the following symptoms of exacerbation of territorial development that have emerged from the 90s of the 20th century up to now:

✓ the low level of competitiveness of Russia does not comply with its economic potential (according to the "World Economic Forum" in 2000 – 2011 Russia's competitiveness ranks in the seventh top ten of countries in the world, there is a tendency of reducing the competitive position of the country);

✓ the low adaptability of regional social and economic systems of Russia to the impact of global financial and economic crises (according to official data, the RF GDP in the crisis of 2009 compared to 2008 decreased by 7.4% – one of the most significant falls in the world);

✓ not high enough level of interaction between enterprises, research and educational institutions in regions, once formed territorial-production complexes, has a negative effect on the binding economic space, which hinders the competitiveness of Russia as at the micro- and macro levels;

✓ leading regions have little influence on the development of adjacent areas, etc.

In connection with the foregoing, the aim of the paper is to study the theoretical and applied aspects of the formation and development of clusters in the regions as ways to increase the competitiveness of the Russian economy.

Disaggregation of the goal involves the following tasks:

1. Review of existing foreign and local clusters.

2. Explanation of reasonability of formation and development of clusters in the regions of Russia.

3. Identification of key problems of formation and development of clusters.

4. Development of principles and algorithms for the implementation of cluster policy in the regions of Russia.

5. Development of methodology for assessing future economic activity for the formation of clusters in the region and its testing on the materials of the Republic of Bashkortostan.

The practice of the most competitive countries in the world shows that an effective mechanism to enhance their competitiveness is the implementation of cluster policy, comprising a complex of legislative, administrative, economic and other activities aimed at creating and supporting the development of clusters.

Thus, countries-leaders of competitiveness rating such as Switzerland, the UK, Germany, Finland, Denmark, Sweden and the Netherlands carry out a targeted cluster policy. In these countries there is a network of competitive clusters, which employ about 40% of total employment in the economy, and produce more than 50% of GNP. The largest number of competitive clusters, according to the Institute for Strategy and Competition, Harvard Business School, operates in the UK (168) and the USA (152) [1].

In Finland, from eleven clusters the most important for the economy are: forestry, information, telecommunication, metallurgy and engineering clusters, providing the bulk of exports and forming a significant part of the gross domestic product. In Germany, according to experts, there are three world's top clusters of seven clusters of high technology, known as the "Silicon Valley of the twenty-first century" – these are Munich, Hamburg, Dresden.

Following the example of the leading countries the state support of cluster initiatives and cluster formation is carried out in China, India, Austria, Indonesia, Malaysia, Mexico, the Czech Republic, Hungary, Kazakhstan, Ukraine and others, that had a positive impact on the economy of these countries.

As from 2000, in a number of Russian regions cluster initiatives are formed. The pilot clusters projects are being developed on the examples of Nizhnekamsk petrochemical cluster, the cluster of the Lower Angara region, the automotive cluster in the Volga region, St. Petersburg maritime cluster, Ivanovo textile cluster, cluster of processing titanium, "Titanium Valley" [2] in the Sverdlovsk region, the prototype of the innovative cluster "Skolkovo", etc. But in Russia, *there is no systematic cluster policy*. The concept project for the development of cluster policy of the Russian Federation, developed in 2007 still remains a project.

In order to improve country's competitiveness *it is necessary to conduct economic changes*, which are capable in the medium term to significantly improve the quality of life. One of the areas, improving the competitiveness of the country may be the implementation of cluster policy.

This is due to the unique intrinsic characteristics of clusters, allowing to link together the disparate elements of the economic space in the region, namely:

- network organization of economic activity;
- presence of leading companies that can have a significant share in the domestic and foreign markets, supplemented by specialized service organizations;
- availability of competence (specialization in certain types of products competitive in the market on which the cluster has competitive advantages);
- concentration of cluster participants in the limited area, which provides unique advantages;
- interaction between cluster participants to produce competitive products in the domestic and foreign markets;
- presence of competition between cluster participants;

◆ rapid spread of innovations through the extensive network of information transfer.

According to international experts, Russia has only 8 clusters, which does not match the potential of the cluster [3]. This indicates that in the country an insufficient number of clusters are formed that meet the requirements of cluster theory. The problem is that the cluster form of organization is based on a fundamentally different system of linkages of businesses than those that are currently in the Russian practice. This is especially true about specificity of individual sectors and territories. In Russia, there is the dominant vertical integration, as evidenced by a significant number of vertically integrated companies, while the clusters use not only vertical but also horizontal integration.

Based on the synthesis of basic ideas of the theory of supporting economic framework (N.N. Baransky) [4], the theory of the supporting framework of the territorial structure of the economy by G.M. Lappo [5], the theory of poles growth of F. Peru, the theory of framework structures (J.M. Maergoiz) [6], the theory of territorial production complexes (N.N. Kolosovsky, M.K. Bandman) [7], the cluster theory of economic development by M. Porter [8] the concept of the author's supporting cluster framework of regions is proposed.

In the concept the supporting framework of the region is represented as a set of functional frameworks of three types: economic, social and environmental, which form a socio-ecological and economic space of the territory. In contrast to existing concepts of the supporting framework of territories as connecting elements that are "nodes" of development of the regions a network of competitive clusters is to be considered, which are characterized as a group of geographically and technologically interconnected competing companies and service organizations which occupy or are able to occupy a significant share of the domestic and foreign markets, united with the purpose of launching and selling products or specialized services that meet global standards, based on continuous innovation. Clustering, thus, may contribute to the competitiveness of enterprises and organizations entering in it.

The principles of component assembly of framework structure are extremely important. The concept of cluster supporting framework of territories is based on the following principles:

1. The principle of clustering of region's economy, engendering the nodal elements of framework structure and thus to get a synergistic effect of equal and partnership of government, business and science.

2. The principle of the common economic space, which consists in creating an environment that ensures the coordinated development of all components of the framework structure of the regional economy, including economic, environmental and social framework of the territory.

3. The principle of polycentrism, multitude of key elements of framework structure of the economy that can draw adjacent territories into its development.

4. The principle of consistency of strategic priorities for regional development and socio-economic development in general.

5. The principle of complexity of quantitative accounting and valuation of all components of the economic potential of regions. The practical importance of this principle is that it requires a full, comprehensive use of available resources in a given region, to ensure optimal involvement in economic activities of all its components.

6. The principle of dynamics of absolute assessments of framework structures in time requires the development of forecasts that take into account possible future changes in the socio-economic conditions affecting the state, key elements of framework structure of regional economies. The state of various components of framework structure, at the present time and in the future may not be the same.

To form the cluster supporting framework of Russia it is necessary to implement a cluster policy in the regions, which aims to encourage development of competitive clusters of different types and kinds.

At the first "preparatory" stage it is necessary to substantiate the cluster policy in the region, the analysis of foreign experience in the formation of cluster policy, selection of the type of cluster policy for the region, creation of an information base for the implementation of cluster policy.

At the second stage it is planned to allocate competitive clusters in the region – the objects of cluster policy in the region. To do this, it is necessary to justify the principles of separation of clusters, to develop the clusters' tools and identify different types and kinds of clusters in the region, to determine the composition of the clusters.

At the third stage it is reasonable on the basis of developed business plans of cluster projects on a competitive basis to carry out their selection, as well as to form organizational and legal regulations of a potential cluster.

At the fourth stage the decision on implementation of the pilot cluster projects is taken, a mechanism of cluster management is developed, the targeted program to support cluster development, with the compulsory examination in the antitrust committee, is developed.

At the fifth stage the target program to support cluster development in the region is realized, designed to create the necessary institutional, legal and economic conditions for the development of clusters, including: investment, information, personnel, organizational support to the development of clusters.

At the sixth final stage on the basis of the technique there is the monitoring of a cluster. At this stage may be taken a decision to terminate the state support of a cluster project, if the objectives are not met and a certain level of performance of the cluster is not achieved.

After completion of the stage six it can be a return to the third stage for selection of promising cluster projects not previously selected for implementation, depending on changes of the factors of internal and external environment.

In this direction, in the Republic of Bashkortostan the following work was done: the concept of cluster policy was developed, a set of measures for its implementation was approved, at the stage of the formation of the third cluster: timber, power engineering, industrial support of tourism. However, there are difficulties in the implementation of cluster policy in the Republic related to the objective evaluation of cluster potential, attractiveness of investments for the implementation of cluster initiatives, low activity of business entities for the advancement of cluster initiatives, lack of necessary infrastructure to support them, etc.

In order to expedite the implementation of cluster policy in the Republic we have carried out the assessment of types of economic activity (TEA) of the Republic of Bashkortostan promising for the formation of clusters.

The integral assessment of TEA in the Republic of Bashkortostan in 2005 – 2010 was carried out by groups of indicators shown in *table 1.*

For each of the seven groups of indicators, normalized according to the average index of the corresponding TEA indicator, the integral index is defined, followed by ranking and grouping of TEA on the prospects for the formation of clusters in the Republic of Bashkortostan.

The results of TEA grouping by their prospects for the formation of clusters are presented in *table 2.*

The most promising in terms of accelerated socio-economic development of the Republic of Bashkortostan by establishing competitive clusters are: manufacturing, construction, wholesale and retail trade, as well as mining, transport and communications and agriculture.

Table 1. Indicators of assessing the prospects of types of economic activities for the formation of clusters

Group of indicators	Description of indicators
1. Contribution of TEA to the economy	• The share of TEA in GRP, % • The share of TEA in capital assets, % • The share of TEA in investment, %
2. Employment	• The share of TEA by the average number of employees, % • Dynamics of changes in the average number of employees, units.
3. Potential cluster participants	• The share of TEA by the number of enterprises (organizations), % • Dynamics of changes in the number of enterprises (organizations), units.
4. Efficient use of resources	• Labour productivity (in GRP) million rubles/person 2. Capital productivity, rub. • Capital productivity ratio, rub.
5. Dynamics of resource use efficiency	• Capital productivity change, units. • Capital productivity ratio change, units.
6. Efficient use of resources in comparison with the Russian Federation	• Labour productivity in comparison with the Russian Federation, units. • Capital productivity in comparison with the Russian Federation, units. • Capital productivity ratio in comparison with the Russian Federation, units.
7. Localization of the scale of the Russian Federation	• The coefficient of localization by the average number of employees, units. • The coefficient of localization by the number of enterprises (organizations), units. • The coefficient of localization by GRP, units. • The coefficient of localization by fixed assets, units. • The coefficient of localization by investment, units.

Table 2. The grouping of types of economic activity of the RB by prospects for the formation of these clusters

Types of economic activity	Group №	Group characteristics
Manufacturing activity	1	High perspective formation of clusters
Wholesale and retail trade, repairing of motor vehicles, motorcycles, household goods and personal items		
Construction		
Mining operations		
Transport and communications	2	Medium perspective formation of clusters
Agriculture, hunting and forestry		
Real estate, renting and service activities		
Education		
Production and allocation of electricity, gas and water	3	Low perspective formation of clusters
Defense; compulsory social security		
Hotels and restaurants		
Healthcare and social services		
Other community, social and personal services		
Fishing, fish breeding		
Financial activities		

Thereafter, for the cluster separation the expert method is used. The evaluation in the country contributed to more than twenty potential clusters of Russian, regional and local levels, including the petrochemical, polyester, plywood and tile, timber, two machine building (power engineering and automobile), nanotehnological, pharmaceutical, beekeeping, mining, food, meat processing, tourism and recreation, etc.

As an example, we give the analysis of prospects for the formation of plywood and tile cluster in the Republic of Bashkortostan.

The presence of the growth potential and resource availability of a cluster in timber and woodworking industry. Forest Fund of the Republic of Bashkortostan has the area of 6.2 million hectares. Forest cover of the republic, according to the account on 1 January 2010, is 39.2%.

Despite the relatively small scale of forests in comparison with Russia the uniqueness of the forest potential of Bashkortostan is manifested in its composition. In the republic there are 35.0% of Russian lindens – the first place in Russia, 7.0 of alders – the second place, 4.0 – aspens – the fifth place, and 2.0% – birches, the fifteenth place.

The level of use of forest potential of the country currently stands at around 20%. About 8 million m^3 of timber is underutilized annually (83 place in the RF), that led to the accumulation of mature and overmature softwood timber of more than 284 million m^3 in the square: 1598.3 thousand hectares, hardwood – 284.3 thousand hectares, softwood – 257 thousand hectares.

One of the main causes of underutilization of the forest fund is: the lack of high-performance logging equipment and production facilities for processing low-grade softwood timber.

Another reason is a low rate of renewal of fixed assets in the forestry and wood industry of the country, lagging behind the average pace for the whole industry. This fact demonstrates the need for expansion of existing production facilities for advanced processing of softwood lumber.

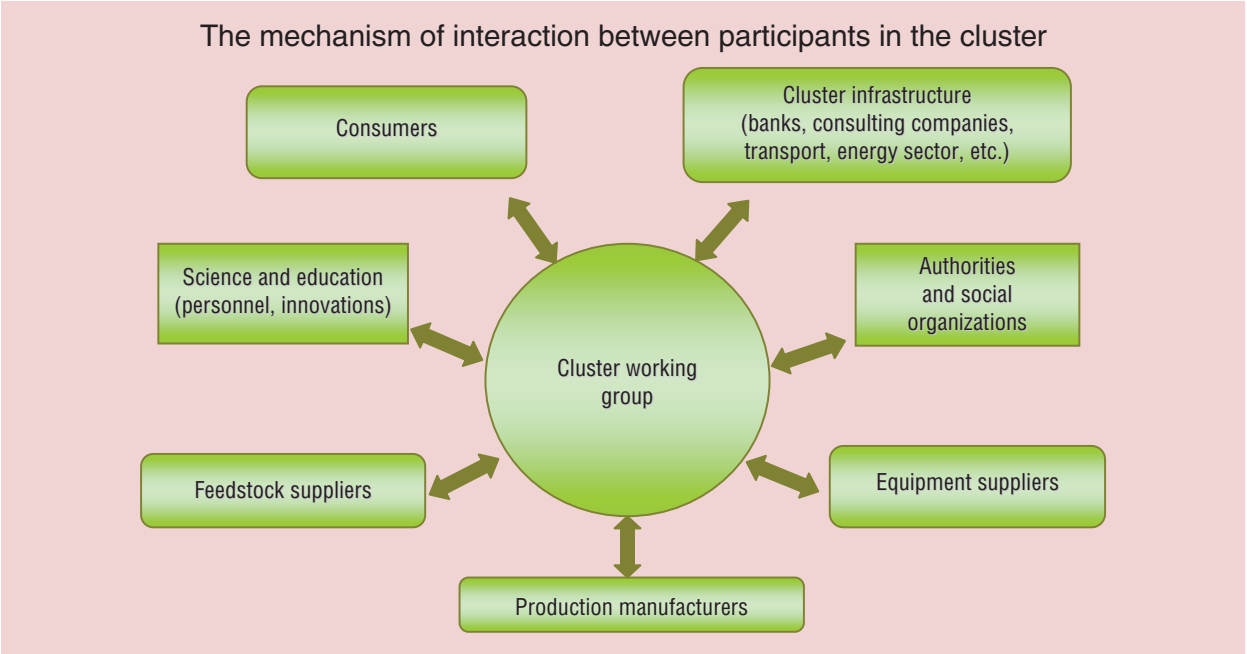
The presence of the leader enterprises in production and export of manufactured products. The largest enterprises are LLC "The Ufa Plywood Factory" and LLC "Ufa Plywood and Slab Factory" that can form the core of the cluster.

Laminated birch plywood and fiberboard made by enterprises, are in demand in foreign markets and above all in Europe. Strong global demand for these products has led to an increase in their exports over the period of 1990 – 2010 plywood by 2.2 times, fiberboard – 1.4 times, etc. The share of exports of plywood in recent years is 62.1% of the volume of production and the share of exports of fiberboard – 58.3%.

Businesses can become in the near future points of growth of the economy of the Republic. To do this within the plywood and slab cluster it is necessary to expand production capacity to produce products with higher value added: large-format plywood, MDF, fibreboard and particle board, charcoal and wood chemical products (acetic acid, ethyl acetate, furfural, etc.). Implementing the proposed measures may give impetus to the development of related industries and, above all, logging, thereby, promote the fullest use of prescribed cut.

The presence of potential participants in the cluster. In the timber industry of Bashkortostan the woodworking industry is represented, above all, by holding "Bashkir Timber Company" in which are focused logging enterprises LLC "Amzinsk timber factory", LLC "Beloretsk timber factory", LLC "Burzian timber factory", LLC "Tirlyansk timber factory", LLC "Zigazinsk timber factory", LLC "Kananikolsk timber factory", "Avzyansk timber factory", two plywood factories (LLC "Ufa wood-processing plant", LLC "Ufa plywood factory"), a leasing company LLC "Forest-Leasing". Ufa match factory, Tuimazinsk paper mill, Uchalinsk cardboard and ruberoid plant also function. In forestry, there are forestries of Ministry of Forestry of the Republic of Bashkortostan. Forest science is represented by the laboratory of forest sciences of the Institute of Biology of the USC RAS, the Botanical Garden of USC RAS, the Bashkir seed experimental station, the Bashkir forest project. Training is provided by the faculty of land management and forestry of the Bashkir State Agricultural University, the Ufa Forestry College. Currently, however, enterprises of wood and wood processing industry, forestry and forest science are *divided* among themselves. As a result of logging fund is used inefficiently with great loss of revenue.

Evaluation of risks and growth restrictions. Positive factors, minimizing the risks of wood processing and pulp and paper industry of the Republic, are: a significant number of their own raw materials for manufacturing of plywood, fiberboard, particleboard, MDF and wood-chemical products; stable and growing global timber market; a sharp increase in demand for forest products in China; an increase of domestic consumption of forest products; highly skilled, cheap labor, relatively cheap



raw materials (the domestic price for standing timber is almost 20 times lower than in Europe).

The foregoing suggests that in Bashkortostan there are prerequisites for creating a plywood and slab cluster.

The scheme of interaction of potential participants in plywood and slab cluster may be the following *(figure)*:

Cooperation within the cluster may be in the following areas: procurement of raw materials, logistics, management and information technologies, engineering and innovations, finance and investment, strategic planning, ecology, resource conservation, marketing, training and retraining of specialists.

Thus, the cluster policy, comprising a set of measures of state support of formation and development of clusters not only at the level of individual regions, but also the Russian Federation as a whole, is promising direction for improving the competitiveness of the country.

At the same time the efforts of individual regions in this direction are clearly not enough to solve the problems outlined in the paper and essentially are rare in nature. In this regard, there is a need of implementation of cluster policy in the Russian Federation on the experience of regions, which, of course, require the mobilization of substantial financial resources.

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