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## The Problems of Creation and the Prospects for Development of Regional Clusters

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**Abstract:**

*In the context of modern world economic relations, the intensity of economic development, the growth of competitiveness of the regions and the state should be implemented due to introduction of the newest market mechanisms, able to compensate for spontaneous destructive processes. For Russia, clusterization is one of the ways to develop the economy and to maintain it at the proper level in the system of world economic relations. According to the international experience, significant changes in the organization of production both at the national and international levels contribute to creation of territorial-branch and integration associations, i.e. clusters.*

*The need for a balanced policy on the expediency of creation and development of regional clusters is actualized herein. It is shown that the innovative nature of the country's development requires new approaches, one of which is the formation of territorially integrated production systems based on the cooperation of enterprises of the adjacent industries in the form of clusters.*

*The advantages of the cluster approach to the implementation of the social and economic development of the region are analyzed. The vision of the essence of the concept of a "cluster" by foreign and domestic founders and researchers of the cluster approach is analyzed. The author's understanding of the essence of the regional industrial cluster is proposed. The prerequisites required for an effective and efficient process of building a cluster structure at the regional level are identified and studied.*

**Keywords:** *cluster, clusterization, regional industrial cluster, cluster design, clustering effects, territorial cluster, technological cluster.*

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## 1. Introduction

In the modern context of globalization and strengthening of the international competition, the country's economic development becomes more dependent on the ability of each region to provide a high level of competitiveness both within the state itself and in the world market. The significant changes that occur because of the rapid pace of scientific and technological progress, the revival of the innovative processes, the growing competitiveness of the regions and the state as a whole require modern and effective approaches to the socio-economic development of the country.

The transformation of the world economy and the globalization processes occurring all over the world significantly affect the interest of governments of many countries in clustering processes. The economic clusterization has become a significant impetus in the development of some countries in the world. It allowed them to enter new levels of economic and social growth, providing them with the competitive advantages and prospects for further development in the world market. Numerous studies of the economic clusterization processes performed both in Russia and abroad point to the fact that the geographical proximity of the corresponding economic activities contributes to a high level of labor productivity and development of innovations in the regions.

Since the 1990s, the notion of a "cluster" or "cluster associations" has become widespread in economic literature. The first person to investigate this was Alfred Marshall. It was he who drew attention to the tendency to concentrate the specialized companies in "industrial regions" (the "industrial districts" theory, Marshall, 1920).

Considerable attention was paid to this issue by the American scientist Michael Porter, a professor at the Harvard Business School. He proposed a fundamentally new approach to the analysis of the country's competitiveness, the so-called cluster analysis (Porter, 1990). Porter is considered the founder of the theory of clusters, the study of cluster groups in the economy. Based on the theory of national, state and local competitiveness of goods and services, Porter defined the clusters in 1990 as follows: *"Clusters are the geographically concentrated groups of interrelated companies, specialized suppliers and service providers, firms in the respective industries, and related organizations (for example, universities, standardization agencies, and trade associations) in certain areas, that are competing but acting in cooperation with each other"*.

A little later, Porter begins to interpret clusters as *"... a system of interrelated firms and institutions that is more than a simple sum of components", because, due to the organizational nature of a cluster, these components in sum make possible the minimization of costs, the ability to implement social programs (which in this case are much cheaper than at individual enterprises), the possibility of using*

*"expensive" know-how, etc"* (Porter, 1998). The third definition is given by him in the monograph "Competition". *"A cluster or an industrial group is a group of geographically bordering companies, interconnected and connected to those organizations that operate in a certain sphere and can be characterized by commonality of the activities and interactions"* (Porter, 2006).

Thus, according to Porter, a cluster is a group of firms or industries interconnected with each other and with firms that are geographically concentrated in a certain place, operating in a certain sphere and complementary to each other. According to Porter, clusters are formed due to the following economic effects:

- 1) the production scale effect;
- 2) the coverage effect (the same production factors are used by many firms);
- 3) the synergy effect (joint or cooperative interaction, which allows small enterprises to overcome the lower margin of profitability);
- 4) the trigger effect (minimization of the novel technology assimilation cost).

According to Markova (2004), the cluster is a competitive organizational form of the territorial-hierarchical model of production with different levels of localization, which gives the maximum socio-economic effect through minimizing the expenditures in comparison with similar industries. The evolution of cluster models, based on the integration of related industries and the concentration of production, is studied; the prerequisites for the emergence and the essence of clusters are revealed; their role and place in the development of the economy of the state and the region is determined by the author. According to the author, the cluster integrates the interests of certain enterprises, institutions and organizations that are trying to improve their regional competitiveness, the quality of goods production and service rendering through the exchange of experience. To improve the efficiency of effective coordination of participants in the cluster institution, the governing body is required as a superstructure.

According to the researchers, during the implementation of the cluster model of the region's development, its main advantages in the national market of goods and services will be:

- close interaction of economic entities in a certain region;
- improvement of the opportunities for the implementation of the region's innovative development strategy;
- activation of the integration and globalization processes and, correspondingly, increased competition;
- increase in the efficiency of functioning of the regional production systems and the enterprises included in the cluster;
- creation of proper conditions for the innovation and investment development of the region;
- expansion of enterprises' production program, the emergence of new goods and

- services;
- the possibility to increase the production capacity of competitive enterprises of the clusters, the increase in the competitiveness of the region as a whole;
  - effective use of skilled labor resources (Malyshev and Kamalov, 2011).

The constant economic development of the cluster based on effective interaction of its participants is laid in the very basis of its formation and depends on the degree of interrelations of its participants. As a rule, the development process is manifested through the level of competition.

Within a cluster, enterprises can obtain additional competitive advantages through the internal specialization, standardization, minimization of the expenditures on the introduction of the innovations. It is especially important that there are favorable opportunities for introducing innovations without the fierce competition risk. Moreover, in the cluster, the most competitive companies transfer their own competitive advantages through the technological chain to its other subjects—intermediate and final consumers. At the same time, public or private investments bring simultaneous benefits to many firms. And the presence in the clusters of flexible business structures of small business, especially venture capital, allows forming innovative "*growth points*", introducing new forms and methods of operation with suppliers and consumers.

According to the scientists, the advantages of clusters and other corporate structures are explained by the fact that they:

- 1) provide the access to specialized services at relatively low prices;
- 2) provide the membership, albeit broad, but limited;
- 3) are based on contractual relationships that provide for the mutual benefit;
- 4) facilitate the process of entering horizontal corporate structures of small enterprises;
- 5) are based on cooperation, and therefore do not provide for fierce competition (Uskova, *et al.* 2010).

The existence of the cluster offers the possibility of effective dialogue with the government structures, since the state support and the creation of a favorable investment environment to improve the business environment of the cluster benefit many firms, as opposed to just a limited number of them, as they do when lobbying their interests by the representatives of narrow sectors of production. The formation of clusters mainly at the regional level indicates the importance of the geographic location of the competition actors to form their competitive advantages, despite the progress of globalization.

In recent years, the cluster institution has become the basis for the competitiveness of many countries in the world. Thus, most countries of Western Europe have developed a cluster strategy, which significantly affects the strengthening of

competitiveness and the acceleration of the innovation activity. It should be noted that most of both domestic and foreign economists argue that the regions that have implemented the cluster model occupy a leading position in the development of the economy of a country.

The concept of clustering is focused on the links and interdependence between the companies united in a network structure to manufacture the products and services based on the active use of innovations. It goes beyond the "simple" horizontal networks in which the firms, acting in the general market of finished products and entering one industrial group, cooperate in such areas of activity as research and development, demonstration programs, joint marketing or procurement activities. The concept of clustering presupposes a hierarchy of links between members of the cluster, vertical relationships between the heterogeneous firms that work toward a common result.

The activation of the functioning and the increase in the number of cluster structures in the world economic system testifies to the effectiveness of their application. The main purpose of their functioning is joint training, marketing, procurement, production and creation of economic structures and funds. In the EU countries, clusterization is one of the conditions for increasing the competitiveness of the economies of regions and the state.

So, in 1989-1990 in Denmark, the foundations for clustering the territory were laid. Today, there are 29 clusters functioning in which 40% of all enterprises of the country providing 60% of exports are involved (Koloshin *et al.*, 2009; Razgulyaev *et al.*, 2009; Timofeev and Rusinov, 2009; Pyatinkin and Bykova, 2011; Tyaglov *et al.*, 2017).

Italy has also been particularly successful in using clusters and networks for small and medium-sized companies. It should be noted that such structures became decisive in the rapid industrialization of the north of Italy. Most small firms in Italy participate in the clusters, specializing in the manufacture of certain products, find their niche and provide themselves with a working program for a long time. This is how the economy of many northern provinces of the country is formed. Larger companies on a contract basis connect clusters to the production of individual assemblies and parts for their subsequent assembly, including in Ferrari, Maserati, Lamborghini factories, etc. In the province of Emilia-Romagna, the partnership system for small and medium-sized companies has been improved and became known in Italy and beyond it as a "*model of Emilia*". The clusters that arise based on small and medium-sized enterprises in Italy are called "*industrial districts*".

According to the definition of the Italian Institute of Statistics, "*an industrial district is a socio-economic unit formed on a local territorial basis, where the communities of people, participating in the same production process, interact*" (Lenchuk and Vlaskin, 2010). It is worth noting that industrial districts in Italy account for 30% of

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all employed (Lenchuk and Vlaskin, 2010). The most famous in the world is the industrial district involved in the footwear production, which includes the companies of Ferragamo and Gucci, as well as numerous specialized suppliers.

The UK has twelve-year experience of successful operation of clusters based on biotechnology, environmental technologies, and automotive industry technologies. Here, to develop regional integration, the strategic alternatives to industrial policy were revised and, as a result, a long-term technological program was developed. Consequently, the economies of Scotland, Wales, Northern Ireland and northeastern England are characterized by successful sustainable regional development in the production of automobiles, electronics, as well as food and beverages, clothing and textiles. France is also a model of application of the cluster strategy in the economy development as one of the elements of the industrial policy of the state. The regional programming of 1960s-1970s is based on the concept of "*growth poles*", according to which the industrial development accelerates in the areas where the large enterprises actively cooperate with small and medium-sized enterprises (Nadzhafov, 2012).

Clusters are developing dynamically in the USA. The process of their formation here is defined as the direction of priority development; the appropriate program strategies for the development of the territories are adopted. There are 380 clusters in the USA, employing more than half of the labor force and producing 60% of the country's industrial output. The most famous and successful cluster formations in the United States include Silicon Valley (California, USA), a computer technology cluster; American automotive production in Detroit (Detroit, USA); Center for Nanotechnology, Biotechnology, Renewable Energy and Digital Printing in New Mexico (New Mexico, USA). Many US clusters have a well-defined pharmaceutical specialization. At the same time, the number of biotechnology firms in the clusters is constantly growing. Most of them are financed by venture capital.

The structure and the features of the organization and functioning of many American clusters are thoroughly studied. So, the wine cluster in California includes 680 commercial wine cellars and several thousand independent wine growers. The core of the cluster is functionally complemented by those industries that support the wine industry and growing grapes, including providing grape varieties, irrigation and harvesting equipment, barrels, etc. The association also includes specialized public organizations and advertising firms, numerous publishing houses that serve the wine industry and trade agencies (Bröcker *et al.*, 2003; Frank *et al.*, 2016; Liapis *et al.*, 2013).

The effectiveness of the project for implementing cluster solutions shows the need to change approaches to managing the development of existing territorial models (communities, regions, regions). Researchers believe that the effectiveness of clusters will grow if regional specialization is deepened, and local authorities will be

given more rights and responsibilities to develop business in them (Rosenfeld, 2002).

In general, we believe that the design and creation of regional industrial clusters is the way to a competitive regional economy. In this situation, it is necessary to use the most pragmatic form of the corporate way of economic relations. In our opinion, such a form is industrial clusters. They can be both horizontal and vertical type and have the appearance of conglomerate network association.

## **2. Methods**

A regional industrial cluster (hereinafter referred to as "RIC") is interpreted by the author as an innovative structure, formed in the region based on the concentration of the networks of producers, suppliers and consumers, connected by the general schemes of production and sale of the products, as well as the problems of regional reproduction and development of the institutional environment. The main goal of establishment of a RIC is to improve the cooperative interaction between the subjects of the regional economy to realize their own goals and the competitive advantages of the region.

Since RICs are created and developed by its participants on a voluntary basis on their own initiative and without damage to their rights of a legal entity, a significant factor is the maturity of the non-material operating conditions of the region, determined by the social capital that cannot be bought or borrowed, but can be created and developed. According to the definition of the World Bank, social capital is the social norms and relations that allow people to coordinate their actions to achieve the desired goals. Without going into the scientific discussion on the definitions of the social capital, the authors take for the paradigm that the social capital appears in the triangle "power-enterprise-society".

The social capital structure is poorly formalized, but this does not give any grounds for a different interpretation of its composition, which includes: trust, mutual understanding, social norms, relations, jointly recognized values, behavior, education and knowledge, complicity, solidarity, enterprising, and propensity for innovation.

The listed components of social capital can be decisive for the implementation of cluster initiatives such as the atmosphere of entrepreneurship, innovation ability, industrial culture, self-identification, communication interactivity or the environment of trust. The insufficient culture of entrepreneurship and institutional support can become significant factors in the unsatisfactory state of clustering of the regional economy. As a result, accordingly, there will be a low level of use of labor resources. In general, public capital can be interpreted as a source of creation and development of the long-term forms of cooperation in the region, such as clusters, and considered in the form of four blocks:

- relationships and participation;
- trust and understanding;
- education and knowledge;
- culture and behavior.

A high level of achievement in these blocks positively influences the development of the region's economy; however, the insufficient level results in a decrease in welfare, an increase in transaction costs, the generation of group conflicts, an increase in income inequality, etc. To clarify the readiness of potential RIC participants to join the cluster structure, the study of the representatives of the top management of the enterprises that could participate in such a group (75 respondents) was performed by the authors.

Further, based on the analysis of the opinions of the expert community and the own developments, the study will present the features of RIC design using the example of the standardized regional cluster "Scientific Production and Trade Alliance".

### 3. Results

Having analyzed the answers given by the respondents to the question "Determine the level of the presented factors in the structure of the public potential of the enterprise, characterizing the readiness of the enterprise to join the cluster structure," the authors received the answers presented in Table. 1.

**Table 1.** Distribution of the answers of the respondents to the questions of the questionnaire regarding the main factors in the social capital structure, characterizing the readiness of the enterprise to join the cluster structure

Item	Factors under study	Very high	High	Not very high	Low
1	The level of influence of the availability of the contacts between the employees and management to the innovative solutions in the field of production, technology, management	15	22	35	28
2	The level of influence of the closeness of the bonds among the employees in making new decisions	33	22	39	6
3	The level of influence of risk propensity to knowledge creation	12	21	32	35
4	The level of cultural and moral foundations	18	21	41	20
5	The level of cooperation among the firms	41	30	22	7



6	The level of benefit from participation in the network of cooperation with other structural units	21	45	25	9
7	The level of influence of trust to the effectiveness of cooperation with other structural units	55	25	11	9
8	The level of interest of the management in the knowledge development in the subordinates	41	27	24	8

Thus, among the most influential factors of the social capital, the respondents recognized the level of cooperation and the level of trust among the enterprises within the network, which is a prerequisite for the effectiveness of cooperation, as well as the level of interest of the management in the knowledge development in the subordinates. The respondents also appreciate the possible benefits of participating in the cluster. At the same time, most of the respondents clearly underestimate the influence of close bonds among the employees on the adoption of new decisions, as well as the existence of the contacts between them and the management in making decisions in the field of production, technology, management. At the same time, considering other results of the respondents' answers to the questions posed, proving their readiness for cooperation, we can conclude the presence of the following weak positions in the social capital structure:

- the unwillingness to cooperate;
- the unwillingness to take risks;
- low creativity (creation of new knowledge);
- low propensity to innovate.

In general, it can be stated that the weakest links in social capital in the regions are:

- a) the unwillingness to cooperate (due to low confidence)
- b) the unwillingness to take risks;
- c) low creativity.

This is a significant impediment to the creation of the regional clusters, along with the lack of a well-founded conviction of potential cluster members regarding the possibility of obtaining.

Thus, there are numerous barriers or "bottlenecks" in implementing the idea of regional cluster creation. Because of the lack of the required level of the entrepreneurial culture and experience in establishing the cooperation with the counterparts based on cooperation, the key role is played by the state policy to promote the development of clusters. It combines the blocks of information, financial, infrastructure support and the support for the initiator of the appropriate cluster creation.

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Let us consider the features of RIC design on the example of the "*Scientific Production and Trade Alliance*" cluster. In accordance with the expert opinion, the RIC design provides for the development of a special Provision, with the following title page and the main sections.

### ***1. General Provisions***

The participants (full members of RIC), by realizing their right of voluntary association of their production, scientific, commercial and other activities with other subjects (associate members of RIC), create the associations of the economic entities – the regional industrial cluster "*Scientific Production and Trade Alliance*".

RIC is not a statutory association; it acts on a contractual basis for the purpose of scientific, technical and production-commercial cooperation among the participants, their joint activity on the basis of coordination of managerial decisions in the investment, financial and foreign economic spheres.

### ***2. The structure of the cluster***

This Provision provides for voluntary unofficial association of the existing business entities (commercial banks [branches], insurance companies, chambers of commerce and industry, standardization and metrology centers, enterprises and other interested economic entities), as well as the voluntary establishment of such institutions as the analytical center of the Chamber of Commerce and Industry, the regional consulting centers, the central trading company, the trading house with its own retail network, research and development, design and construction organizations, technology clusters, business incubators, etc.

The initiators-founders of the RIC can be any business entities that understand its importance and form the RIC presidential council as the coordinator of the group, with its subsequent expansion at the expense of other members who have expressed the desire to be members of the cluster. The actual members of the RIC are business entities (enterprises, organizations) that recognize this provision and on whose behalf, upon the decision of the relevant body, for example a general meeting of shareholders of an enterprise or organization, authorized executives applied letter to the presidential council of the cluster. The associated members of the RIC are business entities, which are united, for example, into a scientific and technological center under a cluster and cooperate with the actual members of the cluster on a contractual basis.

### ***3. Legal status***

The RIC members are the legal entities that have the right to conduct independently their economic activities in accordance with the applicable law. They delegate to the Presidential Council of the RIC the authority to coordinate centrally their activities based on the decisions taken by the appointed board members.

### ***4. Purpose and subject of activity***

The purpose of the RIC is to protect the commercial and other interests of its participants, to increase the competitiveness, to incite the development and expansion of the markets for goods (works, services) produced by the cluster members, to coordinate their activities, and to implement joint investment programs.

The subject of the RIC activities includes the implementation of powers on centralized coordination of the activities of cluster participants on the following issues:

- production and sale of the products (works, services) in the framework of joint activities;
- the arrangement of production, commercial, consulting, information, technical servicing of the cluster members, investment activity, creation of the investment funds, investment companies and other organizational structures to conduct the operations with securities, involvement of the additional funds to finance the cluster participants;
- the market research and other studies, the organization and carrying out of the advertising activity, the performance of scientific studies and design and construction works;
- the organization of supply and marketing, foreign economic, commercial and other activities in the interests of the cluster members;
- the coordination and negotiation of the activities of the cluster members;
- the search for potential partners for establishing commercial, industrial, scientific, technical and other forms of cooperation and cooperation in the territory of the Russian Federation and beyond;
- any kind of activity, the implementation of which does not contradict the current legislation and corresponds to the objectives of the RIC organization "*Scientific Production and Trade Alliance*".

#### ***5. Powers and functions of the cluster members***

To achieve the objectives of the RIC "*Scientific Production and Trade Alliance*", its participants voluntarily delegate the respective powers to the presidential council of the cluster. The functions of the actual members of the cluster are determined by the current Regulations, statutory documents and normative and legislative acts of the Russian Federation.

#### **4. Discussion**

The theoretical generalizations of the beneficial consequences of the integration of the enterprises into the cluster make it possible to determine such a structure by outlining the potential of the enterprises' competitiveness:

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*the economic effect:* the effect of the system (production level growth, decrease in specific fixed costs, decrease in specific transaction costs, improvement of the market position, increase in the value of firms);

*the effect of restructuring:* (focus on key competencies, optimization of outsourcing);

*the diversification effect:* (improvement of the flexibility in market conditions, weakening the influence of seasonality, stabilization of financial condition, risk reduction);

*the effect due to legal conditions:* (tax incentives);

*the socio-economic effect:* improving the skill level of the employees; wage growth; improvement of the working conditions; quality service; improvement of the quality parameters of the products consumed in the market;

*the ecological and economic effect that arises from the rational use of natural resources:* the reduction of the negative impact on the environment (application of non-waste technologies, use of energy-saving technologies, implementation of international standards for environmental management).

The advanced detailing of the components of the cluster effect makes it possible, firstly, to increase the level of validity of the decisions on the formation of a cluster, secondly, to create a suitable methodology for the expected results forecasting; thirdly, to avoid the recalculation of the corresponding components of the effect and generally the non-recognition of other essential components and, fourthly, it allows determining the strategic effect of the cluster, taking into account its influence on the local market and natural environment, on the public, in particular, human capital.

From the standpoint of the transformational economy, the creation of clusters in the regions should ensure the increase in its competitiveness by:

- reprofiling the companies and organizing new production in regional companies and corporate structures (production and trade and production and financial);
- the growth of profitability and competitiveness of production, for both individual companies and their alliances;
- diffusion of innovations: both in the corporate structures themselves and in the innovation space around the so-called "economic growth poles";
- market self-organization of the economy at the regional level, which is already manifested in the formation of the regional systems of market relations, the regional markets and market infrastructure.

In the context of this study, the experience of the formation and functioning of the regional clusters in the BRICS countries (China, India) and the TS (Kazakhstan) in comparison with the Russian experience of regional clusterization is of considerable interest.

In the PRC, the regional cluster policy is based on formation of special high-tech production zones performed by the municipal authorities with the support of the central government. The Government of the People's Republic of China selects the companies that receive special privileges, and encourages the cooperation of business structures and higher educational institutions in every possible way, understanding its importance in creating their own technology innovations, improving the technological level of the manufactured goods. To this end, the Chinese government decided to establish technology-licensing offices at universities, which facilitated the commercialization of the research and development results.

Today in China, there are about 60 high technology zones, the profitability of which varies considerably depending on the region. In this connection, the Chinese government set the task to eliminate the inter-regional differences. The effectiveness of the PRC's cluster policy is also indicated by the fact that more than 60% of the total number of foreign investment is received by the country through the high-tech zones (Lavrov, 2012).

Various industrial clusters were developed in China. Thus, the Chinese mobile phone cluster formed in the northern province of China Zhejiang is the world's largest production base, in which many foreign companies (Siemens, Motorola, Mitsubishi, and Nokia) founded enterprises and research centers. The development of the cluster can be traced by considering certain factors: the conditions of demand, the conditions of production factors associated with the supporting industries; strategy, research and development; methods and results of technological implementation; co-production; interaction between industries. Thus, Chinese firms adopt the technology and constantly improve the design and quality control (Models of Organization of the Regional Industrial Clusters, 2013; Rahmat, 2017; Titova *et al.*, 2017).

The investment in the automotive industry of China resulted in the creation of car building clusters with a wide network of suppliers, the research base, the engineering companies and the innovation development centers. So, in Guangdong, an automotive cluster was formed around the assembly plants of Japanese companies Nissan, Honda and Toyota. In addition to the central city of Guangzhou, the cluster has gradually spread to the neighboring cities (Dongguan *et al.*, 2002), and today it occupies almost the entire territory of the province, having concentrated there (in addition to the main production) more than 300 enterprises-manufacturers of the components, spare parts, electronics, accessories and raw material suppliers. The network of companies, engaged in the sale of manufactured products, is widely presented there (Barabolina, 2008; Faizova *et al.*, 2015; Ablav, 2017).

In India, there are more than 2,000 clusters, a little less than a half of which are industrial. The government support plays a key role in the development of clusters in India. The state policy aimed at forming clusters in India has the following

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distinctive features: strict import restrictions; lobbying the interests of the production sector; establishment of high interregional duties on manufactured products, which entails the concentration of producers of one industry in a separate region; the state participation in the capital of the companies. One of the forms of legislative support and provision for clusters in India are the state schemes developed by the relevant ministries. These schemes provide for: the order of formation of new clusters; their financing from the central or local budget; regulation of activities or its regulation; and, if necessary, licensing, quoting or other types of permits.

The approach of the Government of India to stimulating the export potential of the clusters in the sphere of high-technology production and services (ICT, software, pharmaceutical products, etc) has shown effectiveness. This is facilitated by close cooperation between the central government and the regional and local authorities. In the sphere of cluster policy, the Government of India implements special programs, one of which was the Promoting Innovative Clusters (PIC) program aimed at promoting the innovative development of SMEs and providing for development of clusters at the state, regional and local levels. The program was a kind of research project, whose goal was to promote the introduction of innovations in several specially selected clusters (Popov and Beketov, 2011).

The STT Center in India is in Bangalore and adjacent areas, where the public investments are directed and where the interrelationships between research institutes and high-tech industries (electronics, ICT, defense industry, engineering) interacting with a multitude of SMEs are closely intertwined. Large enterprises of the state sector became the accelerators of the technical progress; they provided the ideological and technological support while preparing simultaneously the highly demanded research and production personnel. In the interaction of large enterprises and SMEs, a subcontract relationship, which served as the basis for the formation of consortia, occupies a significant place (Ministry of Economic Development of Russia, 2011).

In the Republic of Kazakhstan, the desire to diversify the national economy resulted in the approval in 2003 of the Strategy for Industrial and Innovative Development until 2015, based on the formation of national clusters in the leading sectors of the economy. As the key factor in the development of Kazakhstan is oil and gas resources, the activities were launched to establish the national petrochemical cluster, focused on close cooperation with the profile companies in Russia, Azerbaijan, China, Indonesia and the United States. In addition to the export of energy resources within the cluster, it was planned to produce petrochemical products (plastics, polypropylene, etc.).

Later, a two-level system of technology clusters was formed in Kazakhstan – six national and seven large regional ones in Alma-Ata, Uralsk, Ust-Kamenogorsk, Shymkent, Karaganda, Petropavlovsk and Astana. A distinctive feature of Kazakhstani industrial clusters was their sectoral focus, the special economic zone

(SEZ) regime, which provided for the preferential taxation, and location of large enterprises with involvement of leading universities and research institutes in the territory. In Kazakhstan technologic clusters, a mixed ownership structure prevails, when the state and private business take part in the implementation of projects in the field of high technology. Thus, it should be emphasized that the introduction of technology clusters in Kazakhstan was quite active.

Today, the State Program for Industrial and Innovative Development of the Republic of Kazakhstan for 2015-2019 (hereinafter referred to as the Program) provides for the stimulation of the cluster development (State Program of Industrial and Innovative Development of the Republic of Kazakhstan for 2015-2019, 2016). The implementation of the cluster approaches is recognized in the Program as an important tool for promoting the industrial development, competitiveness and efficiency of the economy, and the authorized government bodies, in accordance with the program, should focus on the development of the territorial clusters.

During the implementation of the Program, the state will focus on the development and balanced support of at least six pilot territorial clusters.

It is planned to provide the state with the necessary financial and non-financial measures of state support for the creation of the clusters, as well as information and methodological support in the development and implementation of territorial clusters development policy, the organization and implementation of the competitive selection of territorial clusters, and monitoring and evaluation of cluster development initiatives and the implementation of the activity plans for the development of territorial clusters.

The foreign practice of economic clusterization in the regions confirms the expediency and urgency of creation of cluster structures in the regions of the Russian Federation. Moreover, it is believed that the competitiveness of Russia in general and at the regional level will largely depend on how quickly the model of support and development of modern cluster structures will be formed and developed. However, when creating clusters in Russian regions, one should not mechanically copy the foreign technologies for clustering the economy.

Today the industrial clusters in Russia are represented mainly in the form of special economic zones of an industrial-production type, and the innovative cities – in the form of special economic zones of a technical-innovative type. All other possible forms of organization of the industrial clusters and innovative cities are practically not used at the federal level in Russia today.

In 2008, the Ministry of Economic Development prepared the Methodological Recommendations for Implementing the Cluster Policy in the Subjects of the Russian Federation (Methodical Recommendations on the Implementation of Cluster Policy in the Northern Regions No. 20636-AK/D19, 2008), according to

which the main goal of implementing the cluster policy in the regions was to ensure the high rates of the economic growth and economic diversification by increasing the competitiveness of enterprises, research and educational organizations forming the territorial-production clusters. It is assumed that the implementation of cluster policy will contribute to the growth of the competitiveness of the economy at the expense of the potential of the cluster participants associated with their geographical location, including the increased access to innovation, technology, know-how, specialized services, and reducing transaction costs that provide the prerequisites for implementation of joint projects and productive competition.

All Russian regions in the period of 2002-2007 developed their own strategies for social and economic development until 2020, in each of which the cluster policy had the priority positions. The regional industrial clusters in the territory of the Russian Federation (Russian Cluster Observatory) can be divided into two types:

*technology development clusters:* (Moscow, Zelenograd Cluster; Moscow Region, the Innovative Territorial Cluster of Nuclear Physics and Nanotechnologies in Dubna; Kaluga Region, the Cluster of Pharmaceuticals, Biotechnology and Biomedicine in Obninsk; Novosibirsk Region, the Innovative Cluster of Information and Innovation Clusters biopharmaceutical technologies; Krasnoyarsk Territory, the Cluster of Innovative Technologies of ZETA in Zheleznogorsk, etc.);

*the industrial production clusters:* (the Republic of Mordovia, the Energy-Efficient Lighting and Intelligent Lighting Control Systems; the Republic of Tatarstan, Kama Innovative Cluster, Samara Region, the Innovative Territorial Aerospace Cluster, Arkhangelsk Region, the Shipbuilding Innovative Territorial Cluster, Nizhny Novgorod Region, the Industrial Innovation Cluster in the Automotive Industry and Petrochemistry, etc.).

In Russia, the distribution of cluster structures within the framework of the cluster policy of the country and regions is viewed as an integrated development mechanism that ensures the growth of the competitiveness of the country and the region based on innovations and synergies of territorial self-organization and partnership.

## 5. Conclusion

The introduction of the concept of clustering will provide the regions with many advantages and opportunities. The main one for production enterprises, business, government and educational institutions will be the opportunity to work in a joint direction to increase production volumes of competitive products, and strengthening the production potential of the region.

Such cooperation will make it possible to use effectively the raw materials, production and human resources available in the region and help to develop the leading branches of the region more powerfully, which, in turn, will lead to overall



economic growth. Moreover, the clustering will help in solving the relevant issues in the field of human resources and investment involvement, planning and development of the technical infrastructure. The implementation of the concept of clustering at the regional level will allow to:

- accelerate the creation of industrial and innovative clusters in the region;
- develop a network of clusters, uniting small and medium-sized enterprises, as well as form regional clusters of enterprises and institutions;
- increase the competitiveness of enterprises in the region;
- ensure the development of the entrepreneurial and institutional infrastructure;
- accelerate the development of the innovative sector of the economy through the development and implementation of an innovative model for the development of the region;
- improve the investment attractiveness of the region and ensure the growth of domestic and foreign investment in the economy;
- increase the export of goods and services and mutual support during the conclusion of international treaties;
- improve the efficiency of the training system for the needs of the region;
- provide the information and educational activities in the field of cluster development.

Moreover, the significant role in the development of the processes of clustering the economy of the region is played by social infrastructure. It helps to ensure the exchange of technologies and knowledge, which strengthens the cluster institution and ensures their further development.

It should be noted that the development of clustering processes depends on certain key factors, which include the exchange of technologies, knowledge, the development of the skills of the employees in the related industries, and the improvement of social, commercial and industrial infrastructure.

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