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## INNOVATION CLUSTER DEVELOPMENT AS A FACTOR FOR SUSTAINABLE REGIONAL ECONOMIC GROWTH

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### *Abstract*

In this work, the concept of an innovation regional cluster is considered as an instrument for sustainable regional growth. The factors of regional economic development are viewed concerning the clustering policy. The lack of adaptation of the state strategic programmes to regional specifics and the main global trends are underlined. Therefore, it is necessary to search for new ways of increasing regional competitiveness and production. In this regard, clusters are considered to be one of the promising tools for sustainable economic development. The creation of clusters as innovative entities is expected to have a positive impact on the well-being of regions. The goal of this research is to analyse the innovation cluster as a factor for the regional economic increase and highlight the necessity of a systematic planning approach towards economic indicators of a certain territory. In this work, the notions of “innovation regional industrial cluster” and “sustainable regional economic growth” are defined. The analysis is provided, taking into account the peculiarities of cluster entities’ formation and development in the Rostov Region of the Russian Federation. In most cases, the cluster policy in Russia is formed by the state using the “top-to-bottom” principle without considering the economic specifics of a particular region. That is why it is necessary to find ways for successful development of regional clusters to be adapted to the changing conditions in national and global markets.

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**Keywords:** Innovation regional cluster, cluster potential, regional economy development, centre for cluster development, factors for sustainable economic growth.



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## 1. Introduction

Taking into account the main global trends, today's developing economy needs an effective long-term strategy. Therefore, it is necessary to search for new forms of increasing the competitiveness of regional economic systems.

The formation of a new institute, an innovation regional cluster, will lead to a valuable collaboration between industrial enterprises and educational organisations to ensure the chain "scientific idea – experimental development – serial and mass production".

Thus, the theoretical and methodological problems of cluster entities' formation and development in the regional economy are still urgent for scientists all over the world. Today, an innovation regional cluster is considered to be a tool for improving the interaction not only between the cluster entity's participants but other companies and organisations as well that collaborate and compete in a particular area of production.

The partnership between the cluster participants is aimed at increasing the sustainability of economic development and the region's welfare. The state policy plays a vital role in solving the problem of adopting federal programmes to regional and municipal levels. However, it should be implemented not only using the "top-to-bottom" principle but also "bottom-to-top" one, taking into account the regional specifics. Therefore, it is crucial to create regional Centres or Institutions for Cluster Development with the programmes adopted and developed to the regional needs and peculiarities to coordinate the clusters' activity and monitor their dynamics.

## 2. Problem Statement

At the present stage of our society development, the cluster phenomenon has to be analysed from the point of view of the following issues:

- the term "innovation regional industrial cluster" has not still been clearly defined by the scholars;
- the factors of sustainable economic development in the process of regional clustering have not been sufficiently studied;
- a lack of correlation between the state and the regional programmes have a negative influence on the clustering process (state programmes do not take into account the regional specifics).

### 2.1. The term "regional innovation industrial cluster" is not yet clearly defined by the researches

The cluster theory in the field of determining the phenomenon of "innovation regional industrial cluster" and the influence of cluster entities on indicators of sustainable regional economic development require further study and refinement. A great number of issues related to cluster phenomenon is analysed within the framework of traditional cluster theory. The fundamental theoretical and methodological definitions of the term "cluster" have been given in the works of a lot of researchers. Porter (2000) is considered one of the founders of "the cluster-specific environment for innovation" (p. 29). The innovative component of clustering was studied in the works of Preissl and Solimene (2003), Bell (2005), Asheim and

Oughton (2011), Katz and Wagner (2014), Li et al. (2019) and other scientists. However, it should be noted that, despite the significant contribution of researchers, a number of methodological and theoretical problems in the cluster theory are still underdeveloped. In particular, there is no certainty in the definition of the concepts of “cluster”, “innovation cluster”, and “regional/territorial cluster”. Some authors consider that the terms “cluster” and “innovation cluster” denote the same notion (Preissl & Solimene, 2003, p. 73). Others, when analysing the concept of “innovative” cluster, put an accent on a “high-tech” factors (Porter & Stern, 2001, p. 17) or consider the organisations as “technological know-how” related to competitiveness (Castells, 1996, p. 471).

Katz and Wagner (2014) also stated that:

*The competitiveness and productivity of “innovation-driven economic clusters” (p. 13) depend on their “inter-organisation” and “cross-industry collaboration” as well as the ability to generate and efficiently use the information based on knowledge and experience. (p. 6)*

Thus, to intensify the innovative processes in the cluster, it is necessary to use the potential of the region, implement new programmes, develop collaboration between the scientific centres, educational institutions, and the cluster enterprises.

## **2.2. The factors for sustainable economic development in the process of regional clustering are not sufficiently studied**

To reach sustainable economic development of regions it is worth considering a regional innovation cluster as a factor influencing the region’s well-being alongside with other factors that stimulate or hinder the development of clusters (the lack of financial support from the state, low demand for new goods and services, high cost of innovations, deficiency of well-educated staff, weak partnership relations, absence of documentary support).

## **2.3. The lack of correlation between the state and the regional programmes have a negative influence on the clustering process (state programmes do not take into account the regional specifics)**

The analysis of the Rostov Regional Centre for Cluster Development permits to state that the Centre does not effectively form strategic plans, adapt the state programmes to the regional needs and specifics, and does not have a methodology to apply for monitoring the regional clusters’ growth. This is one of the reasons for the formation of programmes for cluster development mainly by the state initiative using the “top-to-bottom” principle.

## **3. Research Questions**

In this work the following research questions are considered:

1. What specifics do theoretical approaches have to the definitions of “innovation industrial regional cluster” and “sustainable regional economic growth?”

2. What is the main aim of a cluster entity towards the increase of the region's well-being?
3. What kind of state initiatives should be applied to stimulate competitiveness, create new jobs, improve life quality, and sustain a cluster entity development?
4. What are the valuable factors to provide sustainable regional economic development in terms of cluster policy?

#### 4. Purpose of the Study

In accordance with the formulated research questions, the purpose of this paper is to analyse the notion of innovation cluster as an instrument for sustainable regional economic development considering the regional specifics and view the conditions under which the clustering policy improves the well-being of the region. Moreover, the research is aimed at the extension of the theoretical concept and clarification of the peculiarities of the approach to a regional cluster.

#### 5. Research Methods

##### 5.1. What specifics do theoretical approaches have to the definitions of “innovation industrial regional cluster” and “sustainable regional economic growth?”

Defining a term “innovation regional cluster” is significant for planning theoretical issues and practical work related to a cluster entity development. Due to the analysis of the theoretical sources, we can come to the conclusion that there is a lack of identical interpretations of the term “innovation cluster” given by the researchers.

In our opinion, the European Commission (2017) defines the concept of “innovation cluster” most capaciously, viewing the following characteristics:

*the regional approach (close location of the groups of firms), cluster education institutions, innovative start-ups, intensive interaction, specialised expertise, the exchange of knowledge and experience as well as cross-sectoral collaboration and dissemination of information among the enterprises. (p. 9)*

American researcher Schumpeter (1934), one of the founders of the term “innovation,” in his work “Theory of Economic Development” examined the development processes, leading to a change and stated that “without development, there is no profit, without profit, there is no development” (p.154).

So, the term “cluster” can be considered as a set of interconnected enterprises, organisations, and institutions united by industry specifics and mutual partnership (Andrienko, 2017, p. 7).

The author considers the term “innovation regional industrial cluster” as an open system of interrelated and interconnected cluster sections in the sphere of science, production, and business that collaborate mutually to strengthen beneficial partnerships at macro-micro-meso chain of levels, ensure the competitiveness and sustain the well-being of a territory. Nowadays, the innovation regional cluster is a valuable factor to sustain the regional economy, entrepreneurship, employment dynamics, and income stability. Modern cluster entities are aimed at innovation growth and follow the direction of “sustainable

regional development,” carved in the report of G.H. Brundtland for the World Commission on Environment and Development (1987).

### **5.2. What is the main aim of a cluster entity towards the increase of the region’s well-being?**

The infrastructure of a regional cluster is aimed at effective interaction between cluster participants of all structural elements of a cluster: educational and research institutions, training centres, non-profit enterprises, regional and municipal authorities, coordinating organisations, Centres or Institutes for Cluster Development, public organisations, investors, and other participants.

In Russia, the process of clustering needs a suitable adaptation to specific regional conditions such as the level of socio-economic development, science and education potential, the level of production and business, urban peculiarities, and socio-cultural environment. The process of cluster entity formation is becoming an innovation process for many Russian territories and its development requires making changes in the federal cluster policy by the municipal authorities. Federal programmes, related to cluster entities, have to be modified concerning the goals and peculiarities of regional planning.

### **5.3. What kind of state initiatives should be applied to stimulate competitiveness, create new jobs, improve life quality, and sustain a cluster entity development?**

Today, the word “innovation” is used not only in science but in everyday communication as well. To imagine a society without innovation is impossible. Innovation is a powerful incentive for competition. It motivates the society members to fulfil their demands, expand the spheres of production, market, business, and cross-cultural collaboration. Innovative forms of production and management lead to a decrease in prices, an increase in profits and financial flows, the emergence of new brands, and companies’ attractiveness.

The official terms that define the state innovation development in the Russian Federation have never been changed for ten years. Thus, the concepts of “innovation cluster” and “innovation regional cluster” are not fully and clearly defined in the federal and municipal documents. This fact leads to the lack of planned instructions for regional clustering.

Currently, the cluster entities are innovation institutions to carry out strategies for territorial evolution. The key point for the cluster policy and clustering programme development is to denote the factors and structurally-meaningful components, leaders, and actors in a cluster organisation that is aimed at satisfying the population needs and socio-economic prosperity of the region.

The documents on strategic planning for the development of the Russian Federation (Fundamentals of the state policy of regional development of the Russian Federation for the period until 2025, 2019; Forecast of socioeconomic development of the Russian Federation for the period until 2036, 2018) include the following spheres:

*Development of science, technology, and innovation, formulation of the problem, the main trajectories of the technological growth in Russia, domestic R&D expenditures, domestic expenditure on research, scientific, and technological development. The priority areas are*

*information technology and electronics, new materials and chemical products, transport, energetics, ecology, and research. (p. 21)*

The strategic forecast assumes a comprehensive programme for the increase of the scientific potential of the country: the perfection of basic research programmes for leading universities and scientific research centres.

To achieve the strategic goal of the Russian Federation in the field of scientific and technological development it is important to fulfil the following tasks: to increase the effectiveness of state participation; ensure the innovative attractiveness of the research segment; create a globally competitive innovation system; widen the rational integration of domestic science and technology into the global innovation system.

The world rating of countries in terms of the Research and Development expenditures by UNESCO Institute for Statistics: Research and Development Expenditure (2017) shows that:

*Russia occupies the 11th place. Russian R&D expenditures in percent of GDP (1.1%) are inferior to Ireland (4.3%), Kenya (4.2%), Australia (3.1%), Georgia (2.9%), Belarus (2.5%), Hungary (2.2%), Lithuania (1.3%), and a number of other countries. These expenses in Russia are also significantly lower than the expenses of the countries that are leading the innovation development: the USA, China, the Republic of Korea, and Japan. In this regard, an important task of strategic planning is the adaptation of federal programmes at the regional level in order to effectively plan and implement the innovation activities, in particular, the development of innovation cluster formations aimed at the sustainable development of regional economies. (p. 5)*

From the above mentioned the Rostov region has all the main directions and provisions for innovation activity. The formation of the Centres for Cluster Development and improvement of their performance will make it possible to adapt the state programmes and initiatives to the regional specifics, monitor the dynamics of cluster development, increase the competitiveness, level of employment, and quality of life. The analysis of the Rostov-on-Don Centre for Cluster Development website (Cluster registry of the Rostov Region, 2020) allows us to draw a conclusion about weak activity regarding the process of the regional clusters' development. That results in the following recommendations to improve its performance: the Centre for Cluster Development should have an innovative online platform that includes a database of regional cluster enterprises, their qualitative and quantitative characteristics, a regulatory framework, a document bank, and a staff training system. The Centre should improve the control and monitoring system of cluster development dynamics to create conditions for sustainable development of the cluster.

#### **5.4. What are the valuable factors to provide sustainable regional economic development in terms of cluster policy?**

Cluster development factors such as the creation of innovative industries; the demand for goods produced by the cluster for the domestic and foreign markets; partnership and collaboration between the

cluster members that take into account mutual interests; and the use of new technologies to improve the quality and volume of products will help to ensure sustainable economic growth in the region.

Such important factors as the training of personnel, the implementation of new information technologies, investment support of cluster members' research activities, participation in grants, attracting new members to joint innovative work as well as financing, technological, scientific and educational work are aimed at the development of an innovation regional cluster.

According to the statistics of Cluster registry of the Rostov Region (2020), there are all necessary conditions for the successful development of an innovation regional industrial cluster in the Rostov Region of the Russian Federation, including:

*Industrial enterprises and manufactures, sustainable production of gas, water, and electricity, research centres and Higher Schools, such as the Southern Federal University, the Don State Technical University, the Rostov State University of Economics, the Rostov State Transport University and others. (p. 8)*

Thus, the Rostov Region has a large amount of energy generating capacity, but, due to some organisational and economic reasons (one of them is a monopoly tax), the industrial consumers do not have direct access. Therefore, it is necessary to create conditions for attracting foreign investment.

There are 8 currently operating clusters and 2 cluster initiatives being implemented in the Southern Federal District (Cluster registry of the Rostov Region, 2020, p. 3). One of the innovation technological clusters is the Southern Constellation, which includes "PAO Taganrog Scientific and Technical Complex named after G.M. Beriev, OAO Granite, OAO Azov Optical Mechanical Plant, OAO Almaz, the Southern Federal University, OAO Regional Development Corporation" (Cluster registry of the Rostov Region, 2020).

The Southern Constellation Cluster can contribute towards the process of sustainable economic growth of the region through the functioning of all cluster members and supporting organisations, including the planned collaboration with the Centre for Cluster Development (Table 01).

**Table 01.** The role of the Southern Constellation innovation regional industrial cluster as a factor for sustainable economic development

<b>South Constellation Cluster</b>	<b>Production and Economic Factors</b>	<b>Scientific and Technological Factors</b>
	Sustainable cluster development	Innovative potential of the cluster development
	Increase in production volumes and growth rates	Availability of the research and educational institutions
	Decrease in production costs	High-tech development, new IT implementation and application
	Increase in product quality	Increase in staff qualification
	Expanding internal and external relations, strengthening cooperation and partnerships at the federal, regional and municipal levels.	Increase in domestic sales and export of products with high surplus value
	Increase in cluster competitiveness	Increase in product competitiveness

## 6. Findings

Today, in Russia it is necessary to adapt the development of innovation clusters to the specific Russian conditions including the process of functioning and development of state power, science and education, business, and society.

Cluster policy is becoming the “new innovative development institution” for many Russian regions, and the cluster approach is able to make changes to the content of state innovation policy. In the Russian Federation, clusters are mainly formed under the will of the state authorities following the “top-to-bottom” principle without taking into account the specifics of the economic development of a particular region.

Based on the analysis of the government initiatives that determine the socio-economic development of the Russian Federation, it can be concluded that significant measures are being taken by the state in the direction to reorient the national economy from resource-based to manufacturing-based principle. Therefore, financial contributions are planned from extra-budgetary funds to develop the infrastructure of the future innovation institution, industrial cluster, which will serve as the basis for the reorientation and modification of the economy.

The state programmes do not have measurable qualitative and quantitative parameters which can help to control the development of innovation regional clusters.

The regional Centre for Cluster Development is currently unable to organize a productive process of developing and monitoring the cluster dynamics.

## 7. Conclusion

The development of an innovation regional cluster can contribute much for sustainable regional growth if the state and regional authorities will take some steps towards regional cluster excellence in the following directions:

- State policy related to cluster development is to be adapted to the regional specifics.
- State, regional, and municipal programmes should contain more defined theoretical and methodological guidelines and data related to cluster development.
- Municipal authorities should be given more power in terms of the formation and development of clusters in the region.
- A special programme and an innovative online platform should be created for The Centres of Cluster Development, giving them the right to provide full-scale support towards regional cluster excellence.
- It is worth studying the international experience in the field of an innovation cluster development to adapt and implement the standards of the European Cluster Excellence Programme (European Foundation of Cluster Excellence, 2020).

Despite the fact that the cluster approach is being constantly modified to follow the new trends of the global economy, the process of clustering still needs further theoretical and methodological improvement to enhance a positive cluster influence on the sustainable regional economic development.

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