

# Innovative Infrastructure in Depressed Regions

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**Abstract**— The problem of development of depressive regions is extremely urgent in modern conditions. It is explained by the fact that due to unfavorable development factors in these regions, it is most difficult to ensure economic and social growth, to carry out infrastructure development, to attract external financing and investments. Depressive regions tend to have a low level of competitiveness and a prolonged economic decline in industrial production, accompanied by an increase in unemployment. The development of such regions is impossible without external intervention. Specialists in the regional economy have described indicators of such regions. They are: the rate of change in industrial production, the level of unemployment, the size of the gross regional product per capita, the industrial output per capita. It is necessary to attract investment in the economy of depressed regions in order to bring their economies to the stage of sustainable growth. It is possible due to the development of the innovation sphere. A key element of the innovative sphere of any region is its innovative infrastructure. In this connection, the analysis of the state and the definition of promising areas for the development of the innovation infrastructure of the "depressed" regions is an urgent and significant scientific task.

The article analyzes the existing state of the innovation infrastructure of ten constituent entities of the Russian Federation, which are considered to be "depressive".

The authors use the method of understanding factual data, the index method, the method of comparisons and the method of expert evaluations.

According to the obtained results, the authors have defined the most promising directions for the development of the innovation infrastructure for these regions.

**Keywords**— *innovation, innovation infrastructure, depressed regions.*

## I. INTRODUCTION

The innovation infrastructure is one of the key factors influencing the dynamics of the rates of both innovation and socio-economic development of any region. At the same time, the formation and further development of the innovation infrastructure should be based on taking into account the characteristics of the socio-economic and innovation system, as well as the regional innovation process being implemented in each specific region. In fact, the formation and development of innovative infrastructure often does not take it into account. In this connection, subjects of innovation infrastructure in the region can actually perform activities that do not correspond to their intended purpose. All this significantly reduces the efficiency of the functioning of the innovation infrastructure

and, ultimately, hinders the innovative development of the region.

This problem is especially important for "depressed" regions, which are characterized by a negative rate of change in industrial production, high unemployment, a low gross regional product per capita and a low production of industrial products per capita [14]. The solution of issues of development of innovation infrastructure in such regions leads to an increase in investment attractiveness and investment inflow and, as a result, creates the opportunity for transition from the category of "depressive" to "prosperous".

## II. 2 LITERATURE REVIEW

Problems of the development of innovative infrastructure were studied in the works of Russian and foreign researchers. Foreign economic researches have covered the following issues: assessment of the role of infrastructure in economic growth and development [1,2]; the impact of public investment in infrastructure on output by the private sector [3,4,5]; analysis of innovation infrastructure and other characteristics of innovation in the regions [6,10,11,12,13] and enterprises [7,8]; management of innovation activities [9].

Russian studies have covered such issues as: the formation of innovative infrastructure in regions with low innovation potential [18], the assessment of the effectiveness of innovative activity of subjects of innovation infrastructure [19,24], the current state of innovation infrastructure in the regions and in Russia as a whole [20,21, 22], the influence of infrastructure objects on innovative activity of regions [23].

There is also a number of works devoted to various issues of innovation development in depressed regions [15,16,17].

Despite the above-mentioned scientific works, the problem of the development of innovative infrastructure in depressed regions is quite urgent.

## III. METHODS OF RESEARCH

The empirical basis of this paper is data on the state of the innovative infrastructure of the "depressed" subjects of the Russian Federation. Russian scientists consider the following subjects of the Russian Federation to be depressive: Ivanovo region; Orel region; Smolensk region; Pskov region; Volgograd region; Chuvash Republic; Kirov region; Ulyanovsk region; Kurgan region; Altai region [14].

The analysis of the state of the innovation infrastructure of these subjects of the Russian Federation was based on the

approach which classifies all elements of the innovation infrastructure according to a functional feature. This approach involves the systematization of the operating elements of the innovation infrastructure based on the study of the functions and the corresponding set of services that should be provided by this or that entity of the innovation infrastructure. As a result, the missing subjects and functions of the innovation infrastructure are identified

#### IV. RESULT

From the point of view of the development of innovative activity in the region, the innovation infrastructure is viewed as a "set of organizations that promote the implementation of innovative projects" specially created and developed in the region" [25]. When considering such organizations, as a rule, the following functional areas are distinguished: financial (various types of funds and other financial institutions); industrial-technological (technopacks, innovation and technology centers, business incubators, centers for collective use, engineering centers, etc.); personnel (educational institutions, etc.); informational and expert-consulting area (information centers, consulting centers, etc.).

Table 1 shows results of the systematization of organizations of innovative infrastructure of depressed regions according to the portal "National Center for Monitoring Innovative Infrastructure of Scientific and Technical Activities and Regional Innovation Systems" of the Ministry of Education and Science of the Russian Federation for 2018.

As we can see from the data of Table 1, Altai Territory is the leader in terms of the total number of subjects of innovation infrastructure (34 organizations). Pskov region has the last place (5 organizations).

Only three regions out of ten (Ulyanovsk, Kurgan, Altai region) have technoparks that allow to cover all stages of the innovation process comprehensively: from the basic scientific research up to the realization of the produced innovative products. Industrial parks were created only in three regions (Smolensk, Kirov, Ulyanovsk region), which have energy carriers, infrastructure and all the necessary administrative and legal conditions for placing innovative industries on their territories.

Less than half of the regions have innovative technological centers and centers for collective use. Innovation and technology centers in these regions (Volgograd, Chuvash Republic, Ulyanovsk, Altai region) allow to support small innovative enterprises. Centers for collective use in these regions (Ivanovo, Chuvash Republic, Kirov, Altai region) give collective access to unique expensive equipment, which creates the opportunity to conduct scientific research necessary for the emergence of innovative products.

Most of all the analyzed regions have the following subjects of innovation infrastructure: financial funds (as a rule, budgetary), business incubators, educational organizations, information centers and technology transfer centers.

TABLE I. NUMBER OF ORGANIZATIONS OF INNOVATION INFRASTRUCTURE OF DEPRESSED REGIONS

Functional area	Ivanovo region	Orel region	Smolensk region	Pskov region	Volgograd region	Chuvash	Kirov region	Ulyanovsk region	Kurgan region	Altai region
Financial area: - bank; - fund; - etc.	1	2	1 1	1	1	2	1	1	1	2
Production and technological area: - technopark; - innovation and technology center; - business incubator; - centre of collective use; - engineering center; - industrial park; - etc.	1 3	1 1	3	1	1 2	1 3 1	2	2 3 2 1 3 1	1 1	1 4 4 1 2
Personnel: - educational establishment; - etc.	8	6	6	1	5	4	3	5	3	7
Informational and expert-consulting area: - information center; - consulting center; - technology transfer center; - etc.	1	1	1 1 7	1	1 2	1	2 1 3	1 4 2 3	2 2	1 2 2 8
Total	14	1 2	2 0	5	1 3	1 4	12	29	13	34

(DONE BY THE AUTHORS ON THE BASIS OF DATA FROM THE SITE [HTTP://WWW.MIRIS.RU](http://www.miris.ru))

#### V. CONCLUSION

Thus, the authors came to the following conclusions. In the reviewed regions, the innovation infrastructure is more focused on supporting the final stage of the innovation process - the commercialization of innovations, and, to a lesser extent, to its initial stages - research and development. In terms of functional focus, organizations of innovation infrastructure that are engaged in information and expert-consulting support of the innovation process prevail. Innovative infrastructure that provides financial support for innovative projects is poorly developed.

In connection with this, the following priority areas for the development of the innovation infrastructure of depressed regions are: the further creation and development of technology parks, collective use centers and financial institutions that finance long-term innovative projects in the field of industrial production. All this will contribute to the innovative development of the economies of these regions through the activation of their own scientific research and their own innovative developments, will have a favorable impact on

the volume of industrial production, on the growth of employment of the population, the inflow of investments, which will create conditions for the transition of these regions to the category of safe.

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