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## KNOWLEDGE-BASED INNOVATION SYSTEM AS A KEY FACTOR FOR SOCIO-ECONOMIC DEVELOPMENT OF THE REGION

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### Abstract.

The relevance of forming the innovative development policy, improving its legal support, developing regional strategies necessitates the introduction of new management tools that can provide a competitive advantage of the region and the country as a whole in the development of innovative economy.

In this context, forming a concept of innovative regional development, investment, concentration of resources in the implementation of highly innovative projects involves, first of all, consideration of the content, structural components of the regional knowledge-based innovation system, directions and principles of its formation and development.

**Key words:** innovative economy, innovative projects, intellectual potential, strategizing, innovative thinking, knowledge-based innovation system.

**Introduction.** Currently, the issues of strategic management of the regional development are directly related to the solution of the high priority task: providing dynamically sustainable development of the regional economy and its competitiveness through innovations and innovative activities [1; 16].

This means under current conditions, firstly, the need to ensure scientific and technological potential in certain areas, which allows achieving the greatest competitive advantages due to the existing resource potential. And, secondly, the regional economy's ability to perceive and to introduce advanced technologies to expand and to strengthen the market for goods and services. Setting of the above mentioned tasks is associated primarily with the need to solve a problem of formation and functioning of an efficient scientific sector and a developed innovation system.

Innovations in today's realities are a purposeful process of transforming new ideas and knowledge in new products and technologies, which will later lead to a certain socio-economic result [2].

The need to switch to an innovative development might be the only way, which everybody has already comprehended, and it can not be doubted. However, despite the fact that the scientific and technical progress, which is now called the innovative development, was discussed at the XXIV CPSU Congress in 1971, effective mechanisms for practical implementation have not been found until now. Strategizing specialists indicate a variety of explanations and reasons [3].

The above problem in a particular area, such as the Belgorod Region, has being currently solved through the organization of systematic focused work orientated on the formation of the knowledge-based innovation environment contributing to the creation of an innovative economy, at which, under the influence of scientific and technological knowledge, the traditional spheres of material production are transformed and radically change their technological base.

**Methods.** As part of considering the issues of formation of an innovation system, the domestic and foreign literature focuses on the questions of defining the basic elements of such system and analyzing the forms of knowledge circulation within the innovation system.

Currently, scientists have no single point of view on the nature of the innovative capacity; the latter is represented as a combination of a wide range of characteristics, including:

- Scientific, entrepreneurial, management and other types of knowledge and skills;
- Partnerships, alliances and networks connecting different sources of knowledge;
- Ability to continually learn and use knowledge more effectively, etc. [4].

Despite numerous studies devoted to the issues of forming the national innovation systems (NIS) and its individual elements, the national economic science failed to develop a holistic approach to defining the essence of the innovation system, its structure, direction of development, methods of planning and formation from the point of view of its impact on improving the economic potential and sustainable socio-economic development of the country's economy. In our opinion, the current stage of development of the regional territories and the Russian society as a whole calls for active application of the strategic management principles, which have the potential to ensure the achievement of the most efficient and stable path of social development in the conditions of forming an innovative economy. However, the strategic approach to management involves not only and not so much the organizational and functional optimization as a change in the meaningful component of the work, its focus on planning, forecasting and management of the process of achieving certain promising targets within the current legislative framework [5,6].

**Main part.** The concept of the national innovation system is increasingly being used in theoretical works, and in the list of practical recommendations for the switch of the Russian economy on an innovative path of development. For example, in the Concept of Long-Term Socio-Economic Development of the Russian Federation created by the Ministry of Economic Development and Trade, a strategic goal for the period until 2020 includes the Russia's transformation into one of the world economic leaders and achieving the level of socio-economic development of the highly industrialized countries. By 2020 Russia should enter the top five leading countries in the world with the highest gross domestic product. The Concept also contains a basic algorithm how to achieve such strategic goal as switching the Russian economy from the export of raw materials to the innovative type of development.

As emphasized by foreign authors, the most important feature of the concept of innovation systems is multi-stakeholder partnerships, which will collectively meet the emerging needs and favorable opportunities [4].

In particular, the authors of the report for the World Bank "Enhancing Agricultural Innovation: How to go Beyond the Strengthening of Research Systems" indicate the following subsystems as the innovation system's main elements: knowledge generation; education and professional training; entrepreneurship (production of goods and services); transfer of scientific knowledge and best practices; innovative infrastructure, including financial and other types of security. [7] At the same time, the innovation system's basis of both the state as a whole and its regions is a knowledge-based innovation system - a subsystem of knowledge generation, which is a set of scientific and technical organizations in the public and private sectors, which carry out fundamental, applied research and development: state research centers, academic and industrial institutes, universities, higher education institutions, divisions of factory science, design bureaus, which create intellectual product, samples of new products and technologies.

Innovative environment of Belgorod Region, which characterizes the readiness of the socio-economic system to innovative transformations, reflects the level of development and efficiency of the functioning of its main components - regional institutions, infrastructure, business and society, and it is a prerequisite for the successful implementation of national and interregional investment projects in nanotechnologies [8;9;10;20].

Accomplishing the tasks of forming a regional knowledge-based innovation system is largely dependent on the concentration of efforts on the creation of two interrelated and mutually reinforcing elements of innovation processes [11].

1. Scientific and technical achievements;
2. Production and technical achievements.

In the first case, the results include fundamentally new knowledge, new scientific and technical ideas, discoveries and inventions, new technologies.

In the second case, this refers, on one hand, to a purposeful development and materialization of the results of scientific and technical achievements (new technologies, new systems, equipment, new methods of production organization and planning, etc.).

On the other hand, this about introduction of the results of advanced research and development (i.e. created samples of innovative products) in mass production and ensuring their effective use and operation.

However, it is important to understand that the fundamental basis for the formation of the above components of innovative processes is the innovative infrastructure, which serves as the main tool and mechanism of the innovative economy; it can, as the "Archimedean lever and pivot point" raise the country's economy on a much higher level. It is the innovative infrastructure that determines a pace (speed) of economic development and welfare of the region's population. In essence, the innovative infrastructure may be defined as a set of interrelated, mutually complementary production and technical systems, organizations, companies and corresponding organizational and management structures, which are necessary and sufficient for the effective implementation of innovation activities and products.

The innovative infrastructure of the scientific and technical activities includes: technology incubators, industrial parks, information networks, expert and consultation bureaus, patent services, financial support institutions, developed stock market, risk insurance system and other specialized organizations. Since 2009, a number of small innovative enterprises is growing. They are created by high schools and scientific organizations in accordance with the Federal Law No. 217-ФЗ (217-FZ) [12] in Belgorod Region each year.

In order to have effective functioning of the innovative economy, the knowledge-based innovative infrastructure should be functionally full. Namely, it should contain a set of the following elements:

- presence of innovation and technology centers in the region capable of solving the tasks of functionally full innovation cycle with a turnkey object of innovative activity;
- presence of a system for formation and management of the knowledge-based potential development in the region;
- creation of an effective intellectual property protection system;
- formation of a financial and credit mechanism for investment of innovative inventions and projects;
- formation of a system for examination and selection of promising innovative business projects;

- development and implementation of effective mechanisms to assess the socio-economic effects of innovative processes both in the short and long term. The latter is particularly significant because the region's innovative planning makes sense only when it is possible to track the achievement of set goals and to take the necessary corrective management solutions, i.e. the question regarding a system of indicators and arrangement of monitoring of innovative development in the territories is significant.

Thus, a well-developed regional innovative infrastructure only ensures the effective implementation of all stages of innovation process right up to the successful commercialization of inventions. In the world practice, the innovation support structures unite into national and international networks, such as the European Business & Innovation Centers Network (EBN); it supports and develops innovative activities in small- and medium-sized businesses in the EU countries [13]. Thus, within the EBN incubators, industrial parks, innovation and technology centers, research institutes, information systems (Euro Info Centres - EIC), technology transfer centers (Innovation Relay Centres - IRC) interact actively. As it is known, realization of any innovative projects is associated with many risks; therefore, a clear state technical policy is of paramount importance, it should be expressed in a system of legal regulation and stimulation of scientific and technical activities in all aspects and sectors of economic activity.

However, having a huge resource potential, the government financing of innovation activities features a number of disadvantages connected with high inertia of all processes; it is caused by many organizations involved in the implementation of projects. Transition of a complex of lately made management solutions on the creation of the Belgorod Knowledge-Based Innovation System (BKBIS) from a recital into practice is associated at least with the fundamental study of the proposed BKBIS concept, formulation of clear targets, indication of the mechanisms for their achievement, definition of final results through a detailed analysis of the resource support for this type of activity and, in general, regional opportunities. As the leading countries' experience shows, the most successful form of organization of development is a close state and business partnership, in which it is a state that provides fundamental science and strategic development, and applied science and practical implementation remain the business community's responsibility. Now the country places its stake on the government financing of scientific and technical progress, while the business should initiate efficient innovation. If we carefully examine the international experience, private capital creates 65-67% of innovation in Europe and the USA. Russia faces a quite opposite situation: most of the financing of innovation process lies with the state. Although Russia is in the top ten countries on financing innovations, we lose out literally to everybody as to the export of high-tech products [14].

In our view, the transition to an innovative path of development is impossible without an initiative from below. The task of innovative development can give a greater positive effect if the system of regional innovative entrepreneurship is started.

Experience shows that one of the main challenges of development and application of advanced technologies in this field is not only that the business does not have a corresponding substantial laboratory and research facilities and scientific staff. It is time for the business community to get rid of the old stereotypes that "everything has already been invented or will be not invented by us", which, in fact, are an intellectual inferiority complex.

The highest stage of intellectual development of a society is a territory's transition from the category of foreign knowledge consumers in the generator of new knowledge. And the most important instrument for the Belgorod Region population intellectualization should be a specifically formed knowledge-based and innovation space.

Intellectualization of population and various innovations appearing on its basis can not occur in a short period. It takes a relatively long period including at first accumulation of knowledge and then turning it into a way of thinking of the general population. Smart loners can only offer original ideas, describe them and even make prototypes, but it takes only collective efforts to transfer them to the rank of mass consumption.

The intellectual security is not less important; it determines an ability of independent technological development. It is a state-level task, which is achieved mainly through the formation of a favorable investment climate.

A sufficiently active work at the federal level has been done in this area. In particular, federal institutes of innovative development, etc are established and provided with resources. Under these conditions, the task of regional significance is to create programs and structures capable of starting effective innovative activities in their territories by means of the available resource support.

However, advanced inventions really applicable in the manufacture and utilized in a short period should be a high priority object of state support.

**Summary.** The effectiveness of the knowledge-based innovation subsystem in the modern national innovation system is determined by its ability to provide the quality of received knowledge, their generation scale, interaction and integration of the scientific community's elements, effective relationships, on one hand, between a state and science, on the other hand, between a scientific community and business environment, which is greatly facilitated and stimulated by the state. The latter is impossible without the establishment of an efficient institutional system as the basis for interaction of a state and business with a knowledge generation system [4;16;17;18;19].

Along with this, in the conditions of development of innovation activities, in a society with innovative economy an attitude to the society's main productive force - a person of highly intellectual and effective labor - should be radically changed.

In this respect, personnel maintenance of regional innovation systems acquires special significance in connection with the transition of secondary, primary and secondary vocational schools in the local management. The index of the intellectual potential development in the Russian regions, which takes into account an average length of schooling of the employed population, share of workers with secondary and higher education, number of graduate students and professionals engaged in research and development per 100 thousand workers, share of GRP spent on personnel training, research and development, is significantly different and far less than optimal in most of the regions [15]. Modern innovations require a certain level of knowledge and control over the maximum amount of scientific and technical information. The higher education system should also be innovative in the region. In the developed countries, most innovations are created in universities, and research and development results are materialized into commercial products and services.

Such trend is realized through the effective relationship among higher school research and development centers, financial sources (public, private, venture capital, etc.) and production companies. The effectiveness of joint actions in the region depends on the availability of highly qualified personnel.

Moreover, the higher education system needs to supply professional personnel that does not only have high-quality knowledge, but it is also capable of innovation. Comparative advantage in science and innovative orientation of education will allow using new sources of economic growth in the region and expanding its competitive potential [9].

**Conclusions.** Thus, it can be stated that a new model of economic development in the region having a dominant component in the form of knowledge-based innovation development is sustainable now; such model can be defined as a "new knowledge-based innovative economy". The role of highly skilled experts is very high in the innovation economy, and it will continue to grow. Therefore, training of the personnel that can effectively manage innovation processes, develop and implement innovative projects is a high priority regional and federal issue. It should be emphasized here that the objective need for innovative development, formation of an innovative economy will require the development of a new personnel training concept.

Such economy requires forming and introducing new strategies for socio-economic development that can provide a competitive advantage in the region and country as a whole.

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