

Improving the infrastructure for the transfer of innovations in the agribusiness

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Abstract. According to the international rating of the environment innovativeness, Russia occupies positions at the end of the first third of the rating and cannot significantly improve its level. At the same time, the stimulation of innovation activity is a necessary instrument of the government to ensure the global competitiveness of the national economy. A number of national projects and programs are being implemented in Russia, which are focused on stimulating innovative and entrepreneurial initiatives, as well as transferring scientific developments to production. The relevance of the study is due to the transformation of methods and forms of knowledge and technology transfer, as well as the development of infrastructure that contributes to the activation of innovative activity in certain sectors of the Russian economy. The main indicators of innovative activity in the agribusiness and the sources of its financing have been studied. Insignificant budget financing, as well as the participation of venture funds and support funds have been revealed. The analysis of state support for the transfer of innovations in the agribusiness at the federal level has been performed. The infrastructure of the state support through a number of Russian departments has been studied. The proposals have been developed for their involvement in the interests of stimulating the transfer of scientific developments in the Russian agribusiness. The study is promising for continuation due to dynamic changes both in the field of innovation transfer support, and the rapid development of support infrastructure.

1 Introduction

Stimulation of innovation is a factor that determines the global competitiveness of national economies in the agribusiness. It ensures sustainable development and increases the competitiveness of the industry. The main global trends in the medium term are the increasing role and importance of innovation and the creation of new business models and high-tech industries that can radically change the structure of industries [1]. A striking example is the digitalization of production and industries [2]. Science-intensive technologies are becoming a determining factor in the economic development of countries [3]. The transfer of modern technologies and innovative developments is a paramount task for development in all sectors,

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including the agribusiness. They will become the basis for the intensive growth and development of the agribusiness and expand the possibilities of adapting to the global economy. It is the transfer of technology that makes it possible to develop and implement the scientific and engineering potential [4]. Since the development of the agribusiness based on knowledge and innovation is the only way for its effective development, and the new digital and technological reality has led to a change in economic systems and production paradigms, as well as the transformation of methods and forms of knowledge transfer, the definition of new approaches to creating an effective infrastructure of the transfer innovation in the agribusiness is timely and necessary.

2 Methodology

In the process of developing proposals for the development of infrastructure for the innovation transfer in the agribusiness, the methods of monographic, comparative and system analysis, as well as synthesis and idealization methods have been used. The official data of the Russian Federal State Statistics Service, the Ministry of Agriculture of Russia, the websites of organizations that support the transfer of innovations, as well as scientific publications of Russian and foreign scientists on the subject of research have been used as an information base.

State support for the innovation transfer in the agribusiness is performed through regional programs that stimulate scientific and technological development and upgrading of the industry within the framework of such national projects as Education, Science, Small and Medium-Sized Business, Digital Economy, Labor Productivity and Employment Support and International Cooperation and Export projects, through the State Program for the Development of Agriculture and the Regulation of Markets for Agricultural Products, Raw Materials and Food and through the Federal Scientific and Technical Program. Innovation-oriented agricultural enterprises can take advantage of measures to support the innovation activities from development institutions, whose activities are focused on stimulating socio-economic and innovative development [5].

The target institutions for the development and stimulation of innovation in the agribusiness are Rosagroleasing and Rosselkhozbank, which support the production upgrading and long-term and short-term investments, as well as promote the development of cooperation and small and medium-sized businesses [6]. The Russian Export Center supports for the development of exports on a systematic basis. SME Corporation provides the financial, infrastructural, property, methodological and other support for small businesses, cooperatives and farmers [7, 8]. At the same time, other structures and organizations provide systemic support in other sectors of the economy, the infrastructure of which can be used in the interests of the agribusiness.

3 Results and Discussion

The generally recognized international rating of the innovativeness of the environment is the Global Innovation Index (GII), the main purpose of which is to find indicators and approaches to better reflect the diversity of innovations in society. At the end of 2021, Russia took the 45th place in the overall ranking of the GII countries having risen by two positions relative to the level of 2020 (table 1).

Table 1. Dynamics of Russia's GII positions.

Years	2017	2018	2019	2020	2021
Global Innovation Index (GII)	45	46	46	47	45
Innovation Resources	43	43	41	42	43
Innovation Results	51	56	59	58	52

*Number of countries: 127 in 2017; 126 in 2018; 129 in 2019; 131 in 2020; 132 in 2021.

According to the GII, the strengths of the Russian innovation system include: human capital and science; the level of market development; the level of business development; the development of technologies and the knowledge economy. Weaknesses are related to the insufficient maturity of the framework conditions for innovation, such as weakness of the institutional infrastructure, underdevelopment and backwardness of the legislative framework in this area, and low investment activity of business. Strong and weak aspects of the Russian innovation system affect the innovation activity of all sectors, including the agribusiness [9].

According to the latest statistics, the level of innovative activity of organizations reached 6.6% in agriculture in 2020, which was by 65% higher than the level of 2016 (3.6%), when statistical observation began, and by 57% higher than the level of 2019 (6.4) [10]. The greatest innovative activity was noted in the sectors of growing seedlings, annual crops and livestock (figure 1).

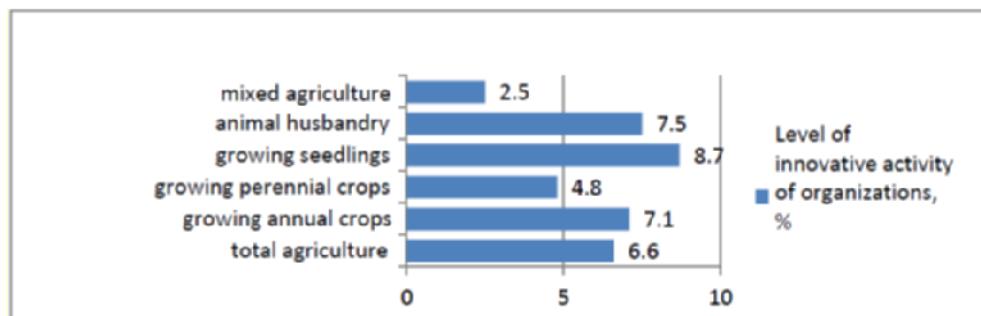


Fig. 1. The structure of innovative activity in the agribusiness, 2020.

Source: Compiled by the authors based on [10].

In 2020, according to the latest statistics, the amount of spending on innovation activities in the agribusiness amounted to 39.7 billion rubles (1.6% of the total costs in the industry), which was higher than that in 2018 (22.0 billion rubles), but significantly lower than that in 2019 (49.4 billion rubles) [9, 10]. At the same time, the main sources of financing for innovative activities in the agribusiness are other sources, which amount to 67% (26.7 billion rubles). These are mainly loans and borrowings (65.9%) and foreign investment amounted to 16.1 billion rubles (40.6% of total costs). Own funds occupy a small share of 12.1 billion rubles (30.4%). It should be noted the insignificant influence of budgets of all levels, venture funds and support funds. For comparison, manufacturing industries, where the share of their own funds in the structure is also large and amounted to 633.0 billion rubles (65%), but the influence of the federal budget is much stronger and amounted to 130.4 billion rubles (13.7%), the cost of support funds in the structure of total costs is 0.4% (table 2).

Table 2. Costs for innovation activity by source of financing and type of economic activities in 2020, billion rubles.

Financing source	Activity type	
	Agribusiness	Manufacturing industries
Expenses for innovation activities, total	39.7	960.7
Own funds of organizations	12.1	633.0
Federal budget	0.5	130.4
Budgets of the constituent territories of the Russian Federation	0.3	0.9
Funds for the support of scientific, engineering and innovative activities	0.0	1.4
Foreign investment	16.1	4.8
Venture capital and private equity funds	0.0	0.1
Other funds	26.7	190.2

Among organizations that have a significant impact on increasing the level of transfer of innovative developments in other sectors of the economy, the Association of Innovative Regions of Russia (AIRR) should be noted, which includes over 300 innovation infrastructure facilities, including regional engineering centers, technology parks, industrial parks, business incubators and innovative territorial clusters.

Since 2021, the Russian Ministry of Education and Science has been implementing the creation of a network of technology transfer centers (TTCs) at scientific and educational organizations. About 30 million rubles of budget subsidies per year have been allocated to 35 such organizations until 2024. They have begun creating student start-up studios that will help create conditions for the implementation of student technology projects.

The Chamber of Commerce and Industry of the Russian Federation (RF CCI) has developed a concept for creating a network of centers of technological excellence (CTE) to provide comprehensive engineering services, including research and development, production, experimental and other work, to create and master innovations. The structure of the CTE includes functional elements that ensure the continuity of the promotion of innovative development.

The RF CCI Foundation for the Development of Innovative Entrepreneurship, which has established R&D centers that have ensured the transfer of scientific developments to the workflows of large Russian industrial enterprises, promotes the introduction of innovations. At the moment, this Foundation has acquired the status of a Center for the Commercialization of Innovations under the Interstate Program for Innovative Cooperation of the CIS Member States for the period up to 2030.

In addition, the RF CCI interacts on an ongoing basis with the chambers of commerce and industry of science cities and scientific centers of Russia, including off-site events with visits to innovative enterprises.

The systematic approach of the Chamber of Commerce and Industry of the Russian Federation deserves a separate analysis. While having a high resource potential (64 chambers of commerce and industry), RF CCI provides services for the intellectual property protection and management of rights to the results of intellectual activity in the field of commercialization of innovations, as well as services to support exporters.

Worthy of attention is the experience of functioning of TTCs that interact with scientific and educational institutions of the Ministry of Education and Science of Russia. To promote innovation, TTCs provide a wide range of services independently or in cooperation with other innovation infrastructure facilities, such as intellectual property centers, engineering centers, export support centers, foreign economic activity support centers, etc.

The National Association for Technology Transfer (NATT) works on creating conditions for the transfer of innovations. NATT is a multifunctional communication platform that performs consulting, educational, and methodological activities in the field of innovation transfer. The NATT members are 73 organizations (as of January 1, 2022), of which 22 ones are from the Business category, 38 ones are from the Science category and 13 ones are from the NPOs and development institutions category.

The National Association for Technology Transfer has been established to solve the problems of transfer. NATT unites the efforts of participants to improve the mechanisms for developing the technology transfer infrastructure. The results of the Association's work include a system for managing the results of intellectual property in some universities and corporations and the creation of a digital platform that provides a single information space for communication between participants in the technology transfer market. In addition, the National Open Innovation Window for external innovative proposals and projects has been established based on the Rostec State Corporation. The one-stop shop principle allows for the collection, examination and consideration of incoming innovative projects for their possible joint implementation with business.

The activities of NATT are focused on forming chains of scientific and technological cooperation, as well as simplifying and improving the efficiency of communications between the sources of innovative developments (science) and their consumers (business).

4 Conclusion

In international comparisons, Russia occupies far from the first positions in the overall rating of the level of development of the innovative environment. According to the state strategy, the priorities of the scientific and technological development of the Russian Federation are areas that allow creating technologies that are the basis for the innovative development of the domestic market for products and services, as well as Russia's stable position in the foreign market. Despite the existing infrastructure for supporting the transfer of innovations in the agribusiness (CTEs, TTCs, support centers, etc.), the existing level of activity in the industry of enterprises in the agribusiness indicates the need to improve it, in particular, expand it through the infrastructure of other industries in which there is more active innovative activity. In order to develop proposals and recommendations for improving the introduction of innovative developments into production in the field of agribusiness, it seems appropriate to study the best practices used by other departments, organizations, funds, etc., specializing in stimulating the introduction of innovations.

Based on the results of the analysis of services, it can be concluded that, at almost all stages of promoting an export project, chambers of commerce and industry and export support centers established on their sites provide almost the entire range of services to export-oriented innovative enterprises.

Cooperation with the Chamber of Commerce and Industry of the Russian Federation deserves special attention. The analysis of RF CCI activities in this area has shown that they operate on their sites in order to facilitate the transfer of innovations. It is proposed to organize systemic cooperation with NATT, which has a developed infrastructure in the regions, with the Chamber of Commerce and Industry of the Russian Federation, in the structure of which elements are organized (centers of intellectual property, technology transfer centers, export support centers, engineering centers, etc.) that ensure the movement of projects through all stages of transfer, with the Association of Innovative regions of Russia, with VEB.RF, a Russian state corporation, and other development institutions to involve their infrastructure potential in order to facilitate the introduction of innovative developments in the field of agribusiness into production based on contractual relations of the Ministry of Agriculture of Russia.

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