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Assessing Governmental Policy Aimed at Promoting Innovation Activity in Agribusiness as a Factor in Achieving the Sustainable Development Goals

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Abstract. In the context of new global challenges and fulfillment of commitments to implement the Sustainable Development Agenda for the period up to 2030, it becomes especially relevant to assess the effectiveness of the current innovation policy pursued by the Russian Federation and its compliance with the priorities of sustainable development adopted by the international community. The purpose of the study is to assess the results of state policy aimed at enhancing innovation in the agricultural sector and to determine the extent to which the targets of programs and strategies for the development of agribusiness in the innovation sector comply with the priorities of Agenda 2030. Applying the system approach to the study of the concept for sustainable development and using our own integrated methodology, we have found that there are no significant results regarding the implementation of innovation policy; we have also revealed an extremely low degree of consistency of federal and regional sectoral programs with the priorities of the Sustainable Development Goals. We have determined that at present it is difficult to conduct a quantitative assessment of the results of innovation policy implementation at the level of a particular region, industry or company; the available indicators do not help to assess their contribution to the achievement of innovation-oriented Sustainable Development Goals. In this regard, we propose to include the objectives of the Sustainable Development Goals in state, sectoral and regional programs for scientific and technological development and to develop a system of their indicators, consistent with the targets of the documents on strategic development of agribusiness in the innovation sector, for monitoring purposes. Thus, the scientific novelty of the research lies in the development and implementation of our own approach to identifying the degree of compliance of the targets of current programs for development of the agricultural sector with the priorities of innovation-oriented Sustainable Development Goals. The results of this study can be used by executive authorities in the development and substantiation of correcting measures aimed at improving state policy in the field of promotion of innovation in the agricultural sector and, as a result, achieving the Sustainable Development Goals.

Key words: state innovation policy, promotion of innovation activity, sustainable development, Sustainable Development Goals, Agenda 2030, food security, agribusiness.

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Introduction

The new development paradigm, which takes into account three core elements – economic growth, social inclusion and environmental protection –provides for qualitative changes based on the widespread use of effective innovation in order to ensure long-term sustainable economic growth. Since successful innovation development can be achieved only by creating appropriate organizational, economic and legal conditions, the role of the state in the formation of an up-to-date innovation policy and its effective implementation is significantly increasing. In this regard, the paper examines individual strategic planning documents in the field of science and technology development, current legislative and other regulatory legal acts of the federal and regional levels, and also assesses the effectiveness of government measures aimed at enhancing innovation.

As we know, in 2011, Russia adopted the Innovation Development Strategy of the Russian Federation for the period up to 2020[1] as a fundamental document of the state innovation policy. Currently, in order to improve innovation policy, the RF Government is working on the formation of a new Strategy taking into account national development goals[2]. However, we should note that Russia was among the States that agreed on the road map adopted by the United Nations in 2015 – the 2030 Agenda for Sustainable Development (Agenda 2030) and committed to achieving 17 Sustainable Development Goals (SDGs) (Kolmar, Sakharov, 2019). Therefore, in the conditions of fulfilling the obligations assumed, while improving the existing strategic documents, it becomes necessary to supplement them with the targets of the SDGs.

Within the framework of this study, special attention is paid to the targets of SDG8[3] and SDG9[4]. Obviously, the inclusion of certain targets of these goals in the RF Innovation Development Strategy that is currently being developed and their successful achievement will contribute to the development of the country's innovation potential and will influence the implementation of Agenda 2030. Thus, achieving target 9.5 (SDG 9) is aimed at promoting "... scientific research, increasing the technological potential of industrial sectors, including by stimulating innovation activity by 2030 ..."[5]. In turn, target 8.3 (SDG 8) involves "promoting development-oriented policies that enhance productive activity, creation of decent jobs, entrepreneurship, creativity and innovation, and encourage the official recognition and development of micro-, small and medium-sized enterprises, including by providing them with access to financial services"[6]. Finally, target 8.2 (SDG 8) – "increasing productivity in the economy" – should be achieved through diversification, technical modernization and innovation[7].

We consider it appropriate to recognize that after the adoption of Agenda 2030 its priorities have already been taken into account in a number of Russia's strategic planning documents. In this regard, the study attempts to determine the degree of consistency of the targets of development programs and strategies with the priorities of SDG 8 and SDG 9 and to assess the degree of integration of Agenda 2030 objectives into state programs in the field of innovation at the federal and regional levels.

As we know, the key functions of the state aimed at achieving sustainable development include food security. In Agenda 2030, one of the central places is given to the problems of food production, agricultural sustainability and innovation development; in this regard, we focus on regulatory documents and the results of implementation of the state innovation policy in the agricultural sector that affect the achievement of the SDGs.

Thus, the purpose of this study is to assess the results of state policy aimed at enhancing innovation in the agricultural sector and to determine the degree of consistency of the targets contained in the programs and strategies for development of agribusiness in the innovation sector with Agenda 2030 priorities.

[1] Innovation Development Strategy of the Russian Federation for the period up to 2020: RF Government Resolution 2227-r,dated December 8, 2011. Available at: http://government.ru/docs/9282/ (accessed: September 18, 2021).

[2] On the national development goals of the Russian Federation for the period up to 2030: Presidential Decree 474, dated July 21, 2020. Available at: http://publication.pravo.gov.ru/Document/View/0001202007210012_(accessed: September 18, 2021).

[3] SDG 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

[4] SDG 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

[5] Transforming our world: the 2030 Agenda for Sustainable Development. Available at: https://docs.cntd.ru/document/420355765 (accessed: September 18, 2021).

[6] Ibidem.

[7] Ibidem.

Scientific novelty of the research lies in the development and implementation of our own approach to identifying the degree of consistency of the targets of current programs for development of the agricultural sector with the priorities of innovation-oriented SDGs.

We put forward the following hypothesis: governmental policy aimed to promote innovation activity of the Russian agribusiness contributes to the formation of key innovation trends in its development in the aspect of sustainability and, as a result, the achievement of the UN SDGs.

In order to test the hypothesis we analyze the results of implementation of innovation policy in the Russian Federation, namely, the actually achieved indicators of the Innovation Development Strategy for the period up to 2020 are compared with the target indicators and the indicators of the SDGs; planned target indicators of the program for scientific and technological development of agriculture are compared with Rosstat data. To assess current state policy in the field of promoting innovation in agribusiness as a factor in achieving the SDGs, our study sets the following tasks: (1) to analyze sectoral state programs for development of the agricultural sector in the innovation sphere; (2) to identify the degree of consistency of the targets of existing programs and strategies for development of agribusiness in the innovation sphere with the priorities of the SDGs; (3) to assess the regulatory framework and the results of promoting innovation activities of agribusiness at the level of a particular region.

Theoretical aspects of the study

In the modern world, there is an understanding that innovation-based development is a path that has no alternative (Kirsanova, 2013). In the course of a theoretical analysis it was established that "the conclusions of researchers regarding the essence of innovation are ambiguous, the definition is multifaceted, the content is multidimensional" (Gorshkova, Ivanov, 2016). It is noteworthy that this term is used not only independently, but also to designate such related concepts as "innovation activity" and "innovation development". Nevertheless, one of the classical definitions is considered to be that by J. Schumpeter, according to which "innovation" includes any changes associated with the use of new or improved solutions in engineering, technology, production organization, supply, etc. (Schumpeter, 1982).

Adhering to this viewpoint and proceeding from the goal set in the article, we will pay attention to the essence of innovation activity in the agro-industrial complex (AIC). In our opinion, it is necessary to support the approach according to which innovation activity in the agro-industrial complex is "a set of interrelated sequential actions to create new or improved agricultural products or their processing, original models of its production in the conditions of constant development of STP. Innovation activity of agricultural organizations is a kind of aggregated assessment of the intensity with which innovations are created, implemented and used" (Strel'nikov, 2017).

Every year, an increasing number of experts are involved in research on agricultural innovation and the potential for innovation development of Russian agriculture (Sandu et al., 2015; Sandu et al., 2020; Kuz'min et al., 2019). Thus, according to M.V. Zhadan, "the innovatization of agriculture is a necessary condition for satisfying the world population's need for food" (Zhadan, 2019). The work (Truflyak et al., 2020) presents important conclusions concerning the necessity and content of the processes of monitoring and forecasting scientific and technological development of Russia's agro-industrial complex for the period up to 2030.

Nevertheless, there are few works in which their authors attempt to assess institutional conditions for the innovation activity of agribusiness. In this regard, of interest are the studies representing

opinions on the content, assessment and improvement of state support for innovation in the agro-industrial complex (Ushachev et al., 2021; Altukhov, 2021). We find it important to mention the opinion of experts from the Higher School of Economics on the need to improve the institutional environment of innovation activity and at the same time build a flexible system for legal regulation in the agro-industrial complex, capable of adapting to new conditions in a timely manner (Orlova et al., 2020). The researchers also draw attention to the indisputable fact that "Acceleration of the pace of scientific and technological development and a more rapid introduction of innovation in the economy and social sphere have led to significant changes in approaches to the formation and implementation of state scientific, technological and innovation policy" (Truflyak et al., 2020).

Meanwhile, we agree with I.S. Sandu, V.I. Nechaev and N.E. Ryzhenkova who believe that the current stage of the technical and technological process in the country's agriculture has contradictions between certain activity aimed to promote innovation and the factors that hinder this activity; such factors include the lack of innovation management mechanisms (Sandu et al., 2020). V.I. Kiryushin's conclusion is very valuable from a methodological point of view: he proposes to improve regulatory support in the innovation system of the agro-industrial complex, develop the infrastructure of innovation process, certification systems and promotion of scientific and technological developments (Kiryushin, 2019). The work of E.A. Derunova, M.Ya. Vasil'chenko and V.L. Shabanov reflects the need to develop mechanisms to stimulate innovation and investment activity in the agrarian economy (Derunova et al., 2021). Sharing this point of view, we believe that the improvement of innovation policy will ensure the growth of innovation and entrepreneurial activity of Russian business, and in the agricultural sector as well.

It is impossible to ignore the fact that Russian researchers consider human resources reduction an increasingly acute problem regarding the implementation of an innovation development path. Thus, T.V. Kasaeva and A.R. Kappusheva come to the conclusion that Russia is not among the leading countries in terms of accumulated human capital and conditions for its active development (Kasaeva, Kappusheva, 2021). Other authors note that the current situation with academic personnel in the country is caused by the lack of consistency in the implementation of innovation policy at the federal and regional levels (Gorbunov et al., 2019). In addition, experts point out that it is impossible to develop resource potential and introduce promising equipment and innovation technology under demographic constraints (Turyansky et al., 2021). We agree with the researchers who note a negative trend associated with a low level of funding allocated to the research in the agricultural sector, which is becoming a serious challenge to ensuring the country's food security and requires improving the overall institutional conditions for innovation and doing business in Russia (Kolmar, Sakharov, 2019).

It is noteworthy that some Russian authors propose an approach according to which modern innovation should largely reflect the introduction of digital technologies, as a result of which the issues related to improving legal regulation of digitalization process and the organizational mechanism of state support for digital technology both in the agro-industrial complex and in the economy of the Russian Federation as a whole were actualized (Ushachev, Kolesnikov, 2020). N.P. Sovetova draws attention to the need to create an innovation platform for building the potential of rural areas and to identify prerequisites for the susceptibility of the rural economy and inhabitants to innovations within the framework of a catch-up development paradigm and the circular (waste-free) economy model (Sovetova, 2021).

Thus, summarizing the above opinions of Russian scientists, we note that at present there is a need to accelerate the pace of scientific and technological development of Russia's agricultural sector on the basis of improving the regulatory framework, developing and implementing state measures aimed at boosting innovation activity of agribusiness.

At the same time, in the context of new global challenges and the fulfillment of commitments to implement Agenda 2030, the works of Russian and foreign scientists devoted to the study of priorities in the field of sustainable development and the achievement of the UN SDGs are becoming particularly relevant. According to Elsevier, over the past five years, over four million articles and reviews on the achievement of the SDGs have been published, and the volume of scientific and applied research in this area continues to increase[8]. For example, the publication by R. Valentini, J. Sievenpiper, M. Antonelli and K. Dembska analyzed the sustainability of the food system based on the UN SDGs and proposed methods, including institutional ones, to achieve long-term sustainability (Valentini et al., 2019). The role of institutional conditions for achieving the SDGs is outlined on a system-wide basis in the work of specialists from Utrecht University (the Netherlands), who convincingly demonstrated the need to measure the real progress of the SDGs, to harmonize and integrate various aspects of sustainable development (Bierman et al., 2017).

The works of other foreign authors focus on the fact that, despite the key role of the private sector in the success of achieving the SDGs, the assessment of its contribution is still an insufficiently studied and complex issue (Calabrese et al., 2021; Diaz-Sarachaga, 2021; García-Sánchez et al., 2020). The researchers emphasize that it is business that can play a significant role in promoting Agenda 2030 by integrating the SDGs into its strategies and offering new solutions to global sustainable development problems (Rosati, Faria, 2019). The work of P. Hazlewood and M. Bouye, which explores the issue of private sector incentive measures regarding the integration of SDGs into business models (Hazlewood, Bouye, 2018), also focuses on the above-mentioned issues.

Russian researchers have also contributed to studying the achievement of the SDGs at the present stage. In our opinion, the work by O.I. Kolmar and A.G. Sakharov (Kolmar, Sakharov, 2019) provides a very valuable practical analysis of the level of reflection of the UN Sustainable Development Goals in the state policy of the Russian Federation. S.N. Bobylev and S.V. Solovyova (Bobylev, Solovyova, 2017) substantiate the inclusion of the sustainability concept in the national long-term development documents that are currently being developed. Other authors consider Russian priorities and directions for adapting Agenda 2030 in the agricultural sector (Cherednichenko et al., 2018). The current trends of business participation in the implementation of the SDGs are touched upon in the works of E.B. Zav'yalova, E.A. Starikova (Zav'yalova, Starikova, 2018), D.B. Kuvalin, A.K. Moiseev, Yu.V. Zinchenko (Kuvalin et al., 2019). The issues of integrating SDGs into business models are reflected in the work of O.I. Dunaev, V.A. Nagornov (Dunaev, Nagornov, 2017). It is noteworthy that among the factors contributing to the achievement of the SDGs, representatives of Russian business note the introduction of innovation, new energy- and resource-saving technology[9].

[8] Elsevier (2020). Landmark analysis by Elsevier maps research data as UN Sustainable Development Goals reach fifth anniversary. Available at: https://www.prnewswire.com/news-releases/landmark-analysis-by-elsevier-maps-research-data-as-un-sustainable-development-goals-reach-fifth-anniversary-301136167.html

[9] Voluntary National Review on the Implementation of the 2030 Agenda for Sustainable Development. Available at: https://sustainabledevelopment.un.org/content/documents/26421VNR_2020_Russia_Report_Russian.pdf

Meanwhile, based on the analysis of numerous publications devoted to the implementation of innovation policy, monitoring and forecasting scientific and technological development and achieving the SDGs, we came to the conclusion that Russian authors have not conducted any studies on the assessment of the current policy in the field of promoting innovation and identifying the degree of consistency of the targets of state programs and strategies for development of agribusiness in the innovation sphere with the priorities of Agenda 2030.

Research methodology

The article is a logical continuation of research on the subject of a scientific project aimed at working out a methodology and developing an organizational and economic mechanism for achieving the SDGs in the national agri-food system.

Within the framework of the project, a review of existing strategies and programs directly or indirectly related to the development of the national agri-food system was carried out, and an assessment of the compliance of their targets with the priorities of the SDGs was given.

The article uses our own integrated research methodology based on two methodological approaches (statistical and sociological) to assess the effectiveness of the state innovation policy implemented in the Russian Federation and the degree of integration of Agenda 2030 priorities into the documents on strategic development in the agricultural sector. An attempt has also been made to determine the degree of consistency of the targets contained in existing programs and strategies for development of agribusiness in the innovation sector with the targets of SDG 9 and SDG 8 using comparative analysis methods.

The information base for the analysis includes statistical data and materials of the Federal State Statistics Service, methodological and analytical developments of the Institute for Statistical Studies and Economics of Knowledge of the National Research University "Higher School of Economics"[10], program documents and legal acts regulating relations in the innovation sphere, and publications of Russian and foreign researchers in periodicals.

The conducted research was based on a system approach to the study of the sustainable development concept, presented in documents and reports on the UN websites, in the works of Russian and foreign scientists, and Internet sources.

Along with statistical data, the quantitative and qualitative assessment of individual processes and phenomena used the information obtained in the course of a sociological survey of representatives of agribusiness in Stavropol Krai carried out as part of a comprehensive study on the subject of the project. In the course of field studies we held meetings with managers and specialists of large, medium-sized, small agricultural enterprises and farms of Stavropol Krai.

All surveys were conducted voluntarily, on the basis of a preliminary agreement with strict compliance with anti-epidemic requirements in connection with the spread of the new coronavirus infection. Respondents could refuse to participate in the survey without explaining why. The methodological tool of the study was a questionnaire developed taking into account the identified socio-economic and environmental problems relevant to the national agri-food system; the content of the questionnaire was discussed with representatives of agribusiness and executive authorities at the regional level – specialists from the Ministry of Agriculture of Stavropol Krai. The questionnaire included questions about the socio-demographic characteristics of respondents (age, gender), the field of their professional activity in accordance

[10] Gokhberg L.M., Gracheva G.A., Ditkovskii K.A. et al. (2021). *Indikatory innovatsionnoi deyatel'nosti: 2021: stat. sb.* [Innovation Activity Indicators: 2021: Statistics Collection]. Moscow: NIU VShE.

with their position, the category and size of farm, its location in the context of agro-climatic zoning of Stavropol Krai and the limits of administrative-territorial units, a block of socio-economic and environmental issues that allow identifying factors that hinder sustainable development of agriculture and rural areas in the region.

Taking into account the subject matter of our study, relevant questions were included in the questionnaire, providing an opportunity to assess the degree of awareness of the expert community regarding the concept of "sustainable development of agriculture (agriculture, rural areas)", awareness of the adoption of the 17 Goals under Agenda 2030 and their priority for agricultural producers in the region. Special attention was paid to the technologies used, the increase in the level of environmental safety of production, and the introduction of nature-saving technologies to improve soil fertility and quality.

The developed tools allowed respondents to reflect their attitude toward new farming techniques and innovation technology and express their opinion about the institutional conditions of agricultural production and its further development.

The questionnaire included questions about the reasons hindering the development of innovation activity, with the possibility of choosing an answer from the proposed set of options or giving one's own answer.

Detailed information about the methodology of the study is provided in the "Results and discussion" section.

The results of the expert survey were processed using the IBM SPSS Statistics software product (version 21).

Due to the lack of statistical information for objective assessment, we had to use an applied methodological approach to assess the results of implementation of the state policy in the field of promoting innovation in agribusiness and the extent of integration of Agenda 2030 priorities into state programs for development of the agricultural sector at the regional level.

Results and discussion

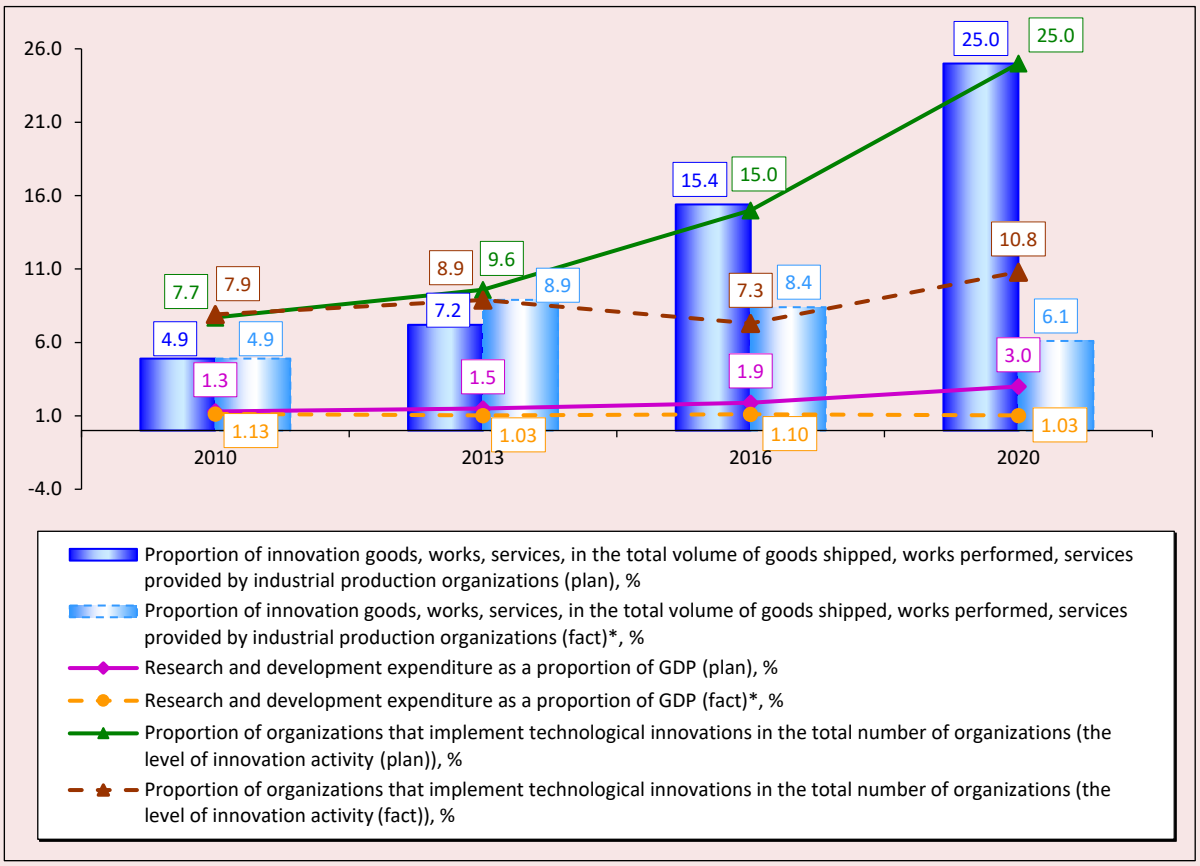
Assessing the results of innovation policy in the Russian Federation and the extent of integration of Agenda 2030 objectives into strategic development documents

The conducted research has shown that in the last decade, innovation policy implemented in the Russian Federation has undergone significant changes. As mentioned earlier, the fundamental document on national innovation policy was the Innovation Development Strategy of the Russian Federation for the period up to 2020 adopted in 2011, which defined the goals, priorities and instruments of national innovation policy, long-term guidelines for development and financing of fundamental and applied science, commercialization of developments. The goals and main directions of modernization and innovation development of the Russian economy are reflected in the Decree of the President of the Russian Federation dated May 7, 2018 no. 204 "On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024"[11] and "The main directions of Government activities for the period up to 2024"[12]. Later, in 2020, a new Decree of the President of the Russian Federation "On the national development goals of the Russian Federation for the period up to 2030" stated that the main priority of innovation development was Russia's joining the top ten countries of the world by 2030 in terms of the quality of general education and

[11] On national goals and strategic objectives of the development of the Russian Federation for the period up to 2024: Presidential Decree 204, dated May 7, 2018. Available at: http://www.kremlin.ru/acts/bank/43027 (accessed: September 18, 2021).

[12] The main directions of Government activities for the period up to 2024: Approved by Chairman of the RF Government, September 29, 2018. Available at: http://government.ru/news/34168/ (accessed: September 18, 2021).

Figure 1. Target indicators for implementing the Innovation Development Strategy of the Russian Federation for the period up to 2020 (plan and fact)



* Actual values of the indicators "Proportion of innovation goods, works, services, in the total volume of goods shipped, works performed, services provided by industrial production organizations" and "Research and development expenditure as a proportion of GDP" are presented for comparison for 2019, due to the lack of data for 2020.

Source: Federal State Statistics Service. Target indicators for implementing the Innovation Development Strategy of the Russian Federation for the period up to 2020. Available at: https://rosstat.gov.ru/folder/14477# (accessed: September 18, 2021).

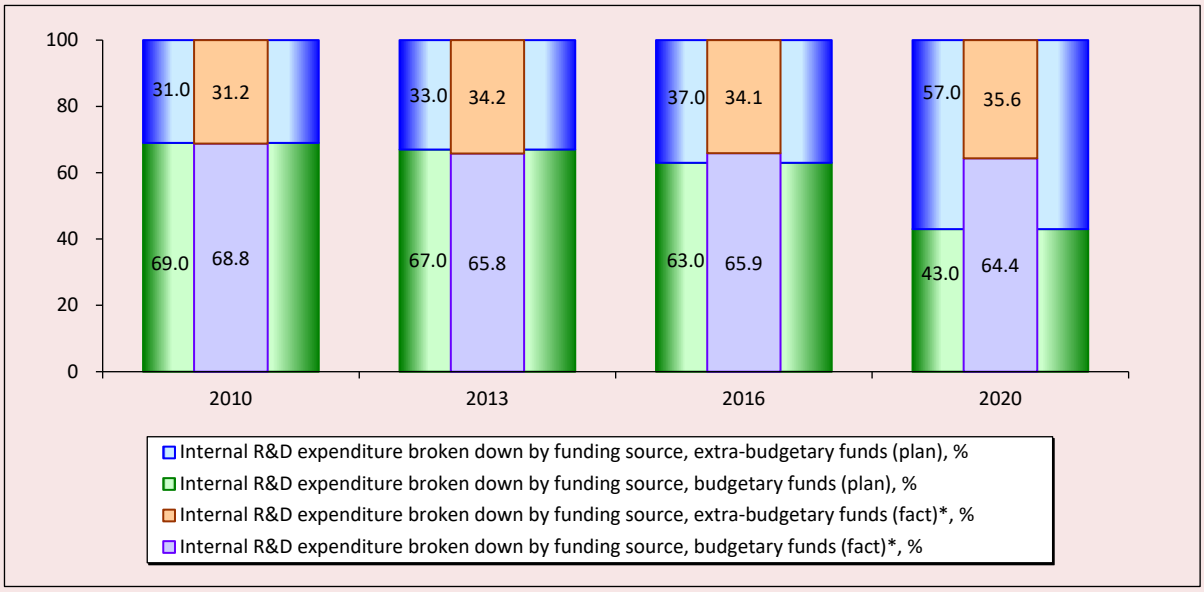
the volume of research and development, including through the creation of an effective system of higher education[13].

The analysis of the ongoing innovation policy shows that, basically, the targets of SDG 8 and SDG 9 within Agenda 2030 in their adapted formulation are integrated into the existing program and regulatory documents on innovation development. However, these documents contain many tasks and indicators that significantly complicate the monitoring and assessment of the degree of achievement of the SDGs. For example, the Innovation Development Strategy of the Russian Federation until 2020 alone contains 45 target indicators, of which only one is consistent with SDG target indicator 9.5.1 "Research and development expenditure as a proportion of Russia's GDP (GDP)".

To assess the effectiveness of innovation policy, let us consider the dynamics of individual target indicators of the fundamental document in

[13] On the national development goals of the Russian Federation for the period up to 2030: Presidential Decree 474, dated July 21, 2020. Available at: http://publication.pravo.gov.ru/Document/View/0001202007210012 (accessed: September 18, 2021).

Figure 2. Target indicators for implementing the Innovation Development Strategy of the Russian Federation for the period up to 2020 (sources of funding, plan and fact)



* Actual values of the indicators "Internal R&D expenditure broken down by funding source, budgetary funds" and "Internal R&D expenditure broken down by funding source, extra-budgetary funds" are given for 2019 for comparison, due to the lack of data for 2020.

Source: Federal State Statistics Service. Target indicators for implementing the Innovation Development Strategy of the Russian Federation for the period up to 2020. Available at: https://rosstat.gov.ru/folder/14477# (accessed: December 5, 2021).

comparison with the values actually achieved *(Fig. 1, 2)*. Thus, the value of the indicator "Research and development expenditure as a proportion of GDP" (SDG 9.5.1) in 2019 was 1.03%, having decreased by 0.1% relative to 2010. In accordance with the target value, the indicator was supposed to have increased to 3% by 2020, but this did not happen. The share of innovation goods, works and services in the total volume of goods by 2020 was supposed to be 25%, but the actual level of the indicator by 2019 has reached only 6.1%. Despite the lack of data for 2020, we can already assume that its planned level will not be reached as well.

The actual value of "The aggregate level of innovation activity of industrial production organizations" (in the current formulation "Proportion of organizations that implement technological innovations in the total number of organizations (the level of innovation activity)", which is the main target of the Strategy, with a planned value of 25% amounted only to 10.8% by 2020; this is significantly lower than the same indicator in developed countries. In addition, the Strategy assumed a decrease in the share of state participation and a sharp increase in business participation in financing innovation: by 2020, the share of budget funds was to be 43%, the share of extra-budgetary sources – 57%. However, this ratio has changed slightly since 2010: in 2019, the share of the state decreased to 64.4%, the share of private investment increased to only 35.6% (see Fig. 2).

The above trends confirm the national indicators of the SDGs in the field of innovation and science, in particular the values of indicators 9.5.1 and 9.5.2 that allow us to assess the achievement of target 9.5 of SDG 9 *(Tab. 1)*.

Table 1. Dynamics of national SDG indicators (innovation and science) in the Russian Federation for the period from 2011 to 2019

SDG indicator	2011	2013	2015	2016	2017	2018	2019	Trend
Research and development expenditure as a proportion of Russia's GDP, % (9.5.1)	1.01	1.03	1.10	1.10	1.11	1.0	1.03	→
Researchers (in full-time equivalent) per million inhabitants, people (9.5.2)	3128.7	3066.7	3065.1	2921.5	2795.6	2764.5	2730.3	↓
Number of advanced manufacturing technologies developed, new for Russia, units	no data	no data	no data	no data	1212	1384	1403	↑
Proportion of innovation goods, works, services, in the total volume of goods shipped, works performed, services provided by organizations, % (OKVED 2)	no data	no data	no data	no data	no data	6.5	5.3	↓
Inventive activity ratio (number of domestic patent applications for inventions filed in Russia per 10 thousand people)	no data	2	2	1.83	1.55	1.7	1.59	↓
Russia's ranking according to the proportion of patent applications for inventions filed in the world in areas determined by scientific and technological development priorities	10	9	10	10	10	11	no data	↓
Russia's ranking according to the number of researchers in full-time equivalent among the world's leading countries (according to the OECD)	4	4	4	4	5	6	no data	↓
Proportion of researchers under the age of 39 in the total number of Russian researchers, %	37.5	40.3	42.9	43.3	43.9	43.9	44.2	↑
Internal research and development expenditure from all sources (at current prices), billion rubles	610.4	749.8	914.7	943.8	1019.2	1028.2	1134.8	↑

↓ – indicator has deteriorated; ↑ – indicator has improved;

→ – indicator does not change or increases by less than 50% of the required rate to achieve the implementation of the SDGs.

Compiled according to: Federal State Statistics Service. National set of SDG indicators. Available at: https://rosstat.gov.ru/sdg/national (accessed: September 18, 2021).

According to the data in Table 1, most of the indicators show negative dynamics. Despite the fact that indicator 9.5.1 "Research and development expenditure as a proportion of GDP" showed some growth in recent years (from 1% in 2018 to 1.03% in 2019), Russia still lags significantly behind the world's leading countries that allocate more than 3% of GDP for these purposes.

Therefore, in the current conditions, it is premature to talk about achieving innovation-oriented SDGs. Even if we take into account the fact that internal research and development expenditure increased by more than 80% compared to 2011, still, judging by the overall results, we can conclude that from among the three possible development scenarios[14] proposed in the Strategy, an inertial scenario was implemented, which is characterized by its authors as "the absence of large-scale efforts aimed at innovation development, and the focus of the policy mainly on maintaining macroeconomic stability, and low parameters of budget expenditures on science, innovation and investment in human capital development. Innovation policy is carried out mainly through general measures aimed at the development of institutions, formation of a favorable business

[14] 1) Scenario of inertial (import-oriented) technological development; 2) Scenario of catching up development and local technological competitiveness; 3) Scenario of achieving leadership in major scientific and technological sectors and fundamental research.

climate, and through organizational assistance measures that do not require significant expenses". This scenario, according to the developers, was likely to "further weaken the national innovation system and increase economic dependence on foreign technology"[15]. Actually, this has happened, taking into account the fact that Russia's lagging behind and depending on industrially developed countries in scientific, technological and innovation development continue to increase (Shulepov et al., 2021).

Thus, despite the fact that in recent years the state has been paying significant attention to innovation development and issuing numerous strategic planning documents and measures to support innovation, the current innovation policy, unfortunately, does not produce significant results. According to the findings of our analysis, the indicators actually achieved during the implementation of the Strategy are significantly lower than the established target indicators for the period up to 2020; this fact does not help to move forward in achieving the SDGs.

Assessing the results of agricultural policy in the field of scientific and technological development and its consistency with the priorities of the SDGs

The results of implementation of agrarian policy in the innovation sphere at the sectoral level. Considering the results of implementation of the agrarian policy, we should note that food security is one of the main directions in ensuring the country's national security in the long term and the most important component of the state socio-economic policy.

The Food Security Doctrine of the Russian Federation, approved in 2020 by a Decree of the President of the Russian Federation, is among the strategic planning documents developed within the framework of goal-setting. The Doctrine highlights the need to achieve the SDGs of Agenda 2030 among the priorities of state policy in the field of ensuring food security[16]. The Federal Scientific and Technological Program for Development of Agriculture for the period from 2017 to 2025, approved by an RF Government Resolution, states that "the most significant risks in the field of food security include technological risks caused by the lag in the level of technological development of the domestic production base from the production base of developed countries..."[17]. Thus, one of the key directions in ensuring food security is accelerated scientific and technological development, which requires the elaboration and implementation of state measures aimed at boosting innovation activity of agribusiness. In turn, increasing the level of scientific and technological development due to the growth of innovation activity of agribusiness can contribute to the achievement of SDG 8 and SDG 9.

Exploring the conditions for development of innovation activities in the agricultural sector, we consider it necessary to focus separately on the priority areas of implementation of the innovation policy developed by the RF Ministry of Agriculture within the framework of the State Program for Development of Agriculture and regulation of agricultural products, raw materials and food markets, approved by an RF Government Resolution in 2012[18]. Thus, the main priorities of innovation policy include the formation of a

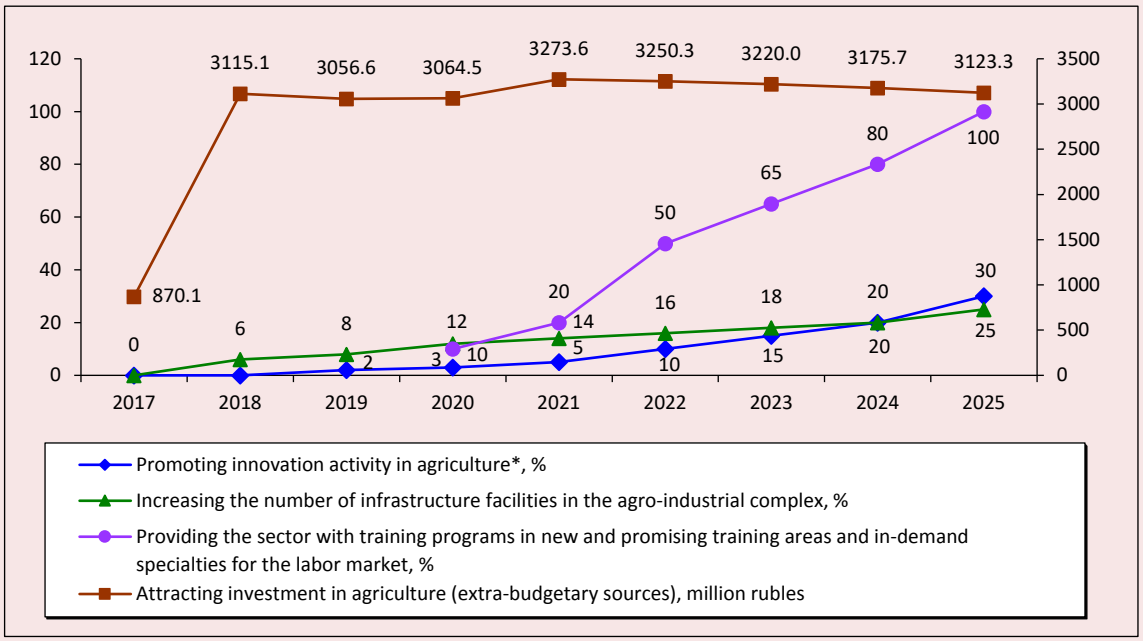
[15] Innovation Development Strategy of the Russian Federation for the period up to 2020: RF Government Resolution 2227-r, dated December 8, 2011. Available at: http://government.ru/docs/9282/ (accessed: September 18, 2021).

[16] On the approval of the Food Security Doctrine of the Russian Federation: Presidential Decree 20, dated January 21, 2020. Available at: http://kremlin.ru/acts/bank/45106 (accessed: September 17, 2021).

[17] Federal Scientific and Technological Program for Development of Agriculture for the period from 2017 to 2025: Approved by RF Government Resolution 996, dated August 25, 2017. Available at: http://government.ru/docs/29004/ (accessed September 17, 2021).

[18] On the State Program for Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets: RF Government Resolution 717, dated July 14, 2012 (as amended on February 11, 2019). Available at: http://government.ru/rugovclassifier/815/events/ (accessed: September 17, 2021).

Figure 3. Target indicators of the Federal Scientific and Technical Program for Development of Agriculture for 2017–2025



* The value of the target indicator "Promoting innovation activity in agriculture" is calculated as the ratio of the number of organizations that carried out technological innovation within the framework of the scientific and technical program in the current year to the number of such organizations in the previous year.

Source: Federal Scientific and Technical Program for Development of Agriculture for 2017–2025: Approved by RF Government Decree 996, dated August 25, 2017. Available at: http://government.ru/docs/29004/ (accessed: September 17, 2021).

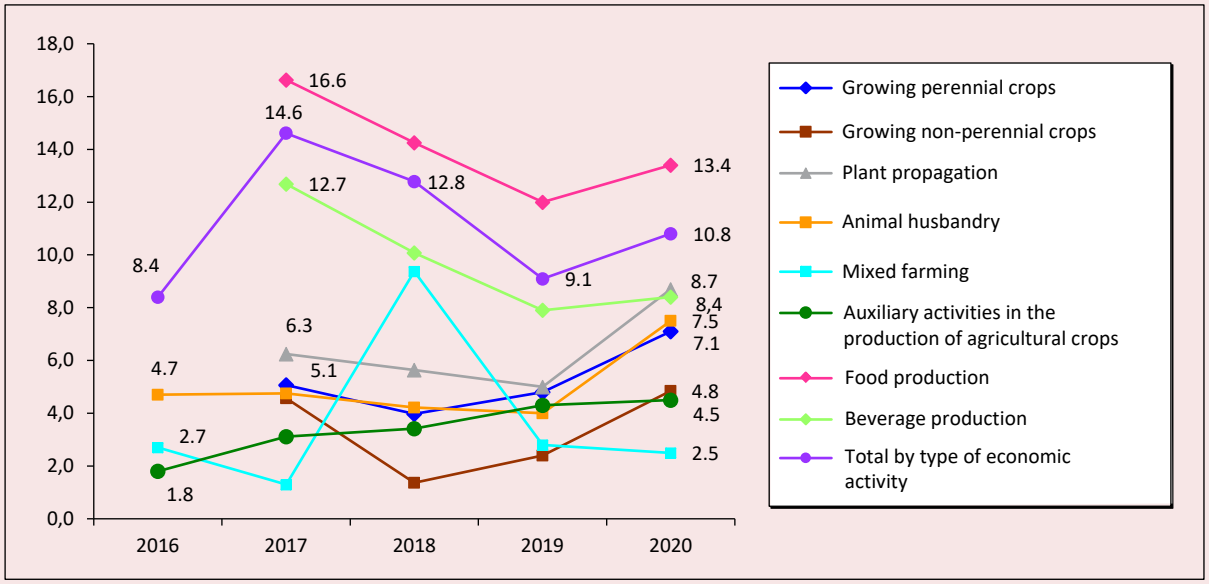
regulatory framework in the field of innovation, execution of fundamental and applied research, personnel training and retraining, development of infrastructure for innovation processes, development of state support measures for agricultural producers.

One of the most important documents defining innovation development in agriculture is the previously mentioned Federal Scientific and Technical Program for Development of Agriculture for 2017–2025" (hereinafter referred to as the scientific and technical program), which provides for the creation of information and consulting centers, support and promotion of research and development. The main target indicators of the scientific and technical program, which allow assessing its effectiveness, include the growth of innovation activity, attracting investment in agriculture, infrastructure development and providing the industry with training programs in new and promising training areas and in-demand specialties for the labor market *(Fig. 3)*.

In accordance with the scientific and technical program, the indicator "Promoting innovation activity in agriculture"[19] in 2020 was supposed to be 3%. Unfortunately, it is not possible to make a comparative assessment, since we could not find actual values of this indicator among the available statistical data. A similar situation develops when searching for quantitative indicators for infrastructure facilities and personnel training programs. This is due to the fact that the target indicators and

[19] Promoting innovation activity in agriculture implies an annual increase in the number of organizations implementing technological innovations.

Figure 4. The level of innovation activity of organizations (total and by type of economic activity), %



Source: Results of federal statistical observations. Federal State Statistics Service.

Form no. 4-innovation "Information on innovation activities of organizations". 2019. Available at: https://rosstat.gov.ru/folder/11189 (accessed: September 18, 2021).

indicators of the scientific and technical program are reflected as a percentage in relation to the previous year, while Rosstat does not monitor the absolute values of these indicators. However, statistical reporting forms contain some information on the indicator "The level of innovation activity in agriculture"[20]. These data are accumulated from a reference form of the federal statistical observation of activities in the field of education, science, innovation and information technology (Form no. 4-innovation "Information on innovation activities of organizations").

According to Rosstat, 7,259 agricultural organizations were surveyed in 2019. Among them, there were only 304 organizations that carried out innovation activities. The value of the indicator "The level of innovation activity of agricultural organizations" in 2019 was 4.2%, which is almost twice lower than the same indicator calculated collectively for all types of activity (9.1%). The highest value of this indicator in agriculture was recorded in 2017 (4.6%).

Figure 4 shows the indicators of innovation activity of agricultural organizations for the period from 2016 to 2020 in the context of industries (subsectors) compared with similar indicators for food production organizations and the aggregate indicator for all types of economic activity. Thus, the maximum values of the level of innovation activity in 2020 were recorded only in the subsectors of crop production such as plant propagation (8.7%) and growing non-perennial crops (7.1%), and in animal husbandry (7.5%). The scale of innovation processes in other types of agricultural production is minor and does not have any significant effect on general trends in the development of innovation activities in the agricultural sector[21].

[20] The share of organizations that implemented technological innovations, in the total number of surveyed organizations.

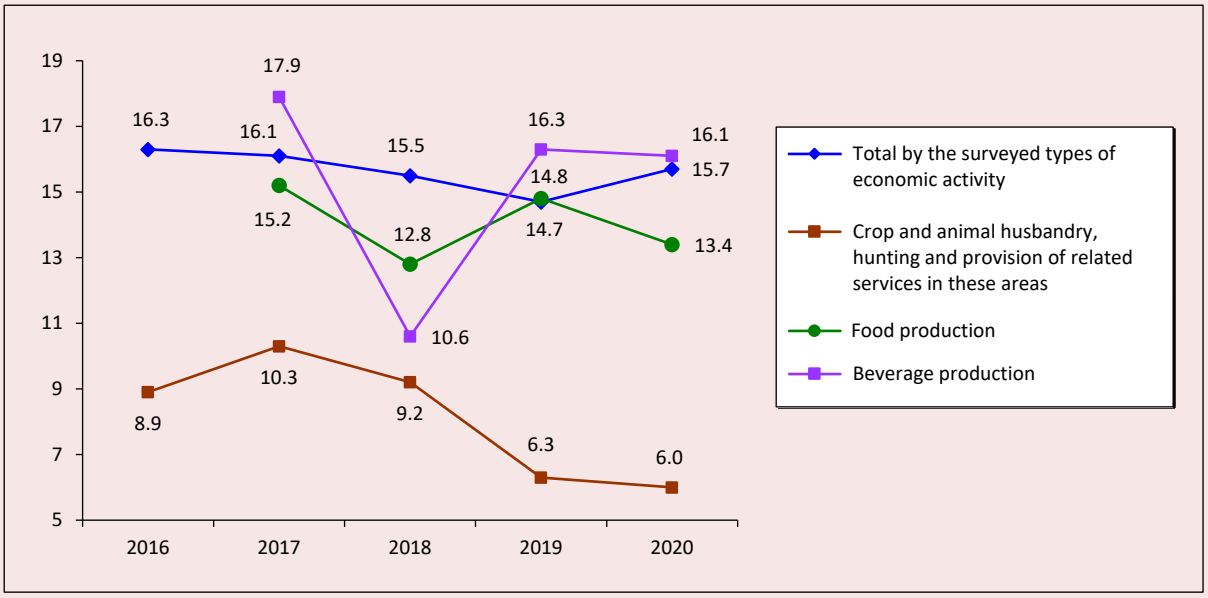
[21] Federal State Statistics Service. Technological development of economic sectors. Science, innovation and advanced manufacturing technology. The level of innovation activity of organizations. Available at: https://rosstat.gov.ru/folder/11189 (accessed: September 17, 2021).

Thus, we observe a low intensity of innovation activity of agricultural organizations in comparison with the aggregate indicator for all types of activity. The insufficient level of innovation activity is aggravated by the low return on the implementation of technological innovation; this fact is confirmed by agricultural producers' assessments regarding the effect of innovation results. Thus, according to statistical observations, representatives of over 85% of organizations indicated that there was no impact of innovation on increasing the yield and productivity of animals, preserving, restoring and increasing soil fertility, reducing dependence on weather, natural and climatic conditions[22].

According to Rosstat, the actual volume of innovation goods, works, and services of agricultural organizations in 2019 amounted to 69.6 billion rubles, their share in total sales was 2.3%[23], which is significantly lower than not only the planned indicator of the Innovation Development Strategy (25%), but also the actually achieved value (6.1%).

Taking into account the fact that investment activity has a significant impact on the development of innovation activity, we should have a closer look at the dynamics of the indicator "The share of investments in fixed assets of agriculture aimed at reconstruction and modernization" *(Fig. 5)*.

Figure 5. The share of investments aimed at reconstruction and modernization (by type of economic activity (OKVED codes 2)), in the total volume of investments in fixed assets in the Russian Federation, %



Source: Results of federal statistical observations. Federal State Statistics Service. Form no. 4-innovation "Information on innovation activities of organizations". Available at: https://rosstat.gov.ru/folder/11189 (accessed: September 18, 2021).

[22] Results of federal statistical observations. Federal State Statistics Service. Form no. 4-innovation "Information on innovation activities of organizations". Available at: https://rosstat.gov.ru/folder/11189 (accessed: September 18, 2021).

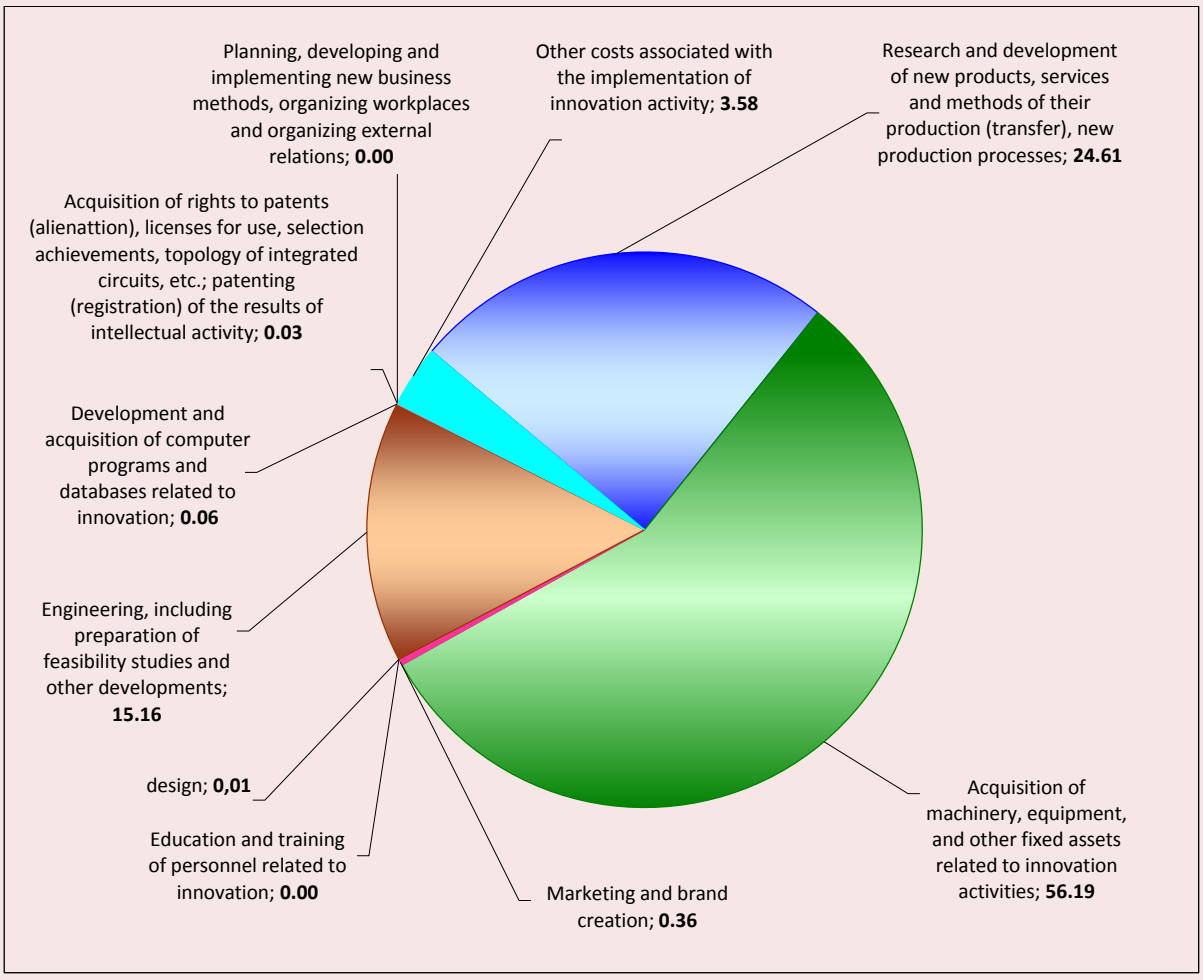
[23] Gokhberg L.M., Gracheva G.A., Ditkovskii K.A. et al. (2021). *Indikatory innovatsionnoi deyatel'nosti: 2021: stat. sb.* [Innovation Activity Indicators: 2021: Statistics Collection]. Moscow: NIU VShE. Available at: https://issek.hse.ru/mirror/pubs/share/465578843.pdf; Federal State Statistics Service. Science and innovation. The volume of innovation goods, works, and services. Available at: https://rosstat.gov.ru/folder/14477 (accessed: November 18, 2021).

As we can see, the share of investments in the fixed assets of agriculture aimed at reconstruction and modernization is the lowest in comparison with the indicators of other types of economic activity and the aggregate indicator; moreover, its dynamics have been negative since 2017 (reduction from 10.9 to 6.0% by 2020).

However, we recall that "Attracting investments in agriculture (extra-budgetary funding sources)", which is the target indicator of the Federal Scientific and Technical Program for Development of Agriculture for 2017–2025 (see Fig. 3) implied a significant increase in investments (3.6-fold) at the expense of private business: from 870.1 million rubles in 2017 to 3,115.1 million rubles by 2020.

According to the results of Rosstat's sample survey, we can conclude that purchasing machinery, equipment and other fixed assets related to innovation was the most popular expenditure item for agricultural organizations in the total volume of investments in innovation development, according to the data for 2019. The share of expenditures for these purposes was 56% *(Fig. 6)*.

Figure 6. Cost structure for innovation activities in agriculture of the Russian Federation in 2019 (by type of innovation activity), %



Source: Results of federal statistical observations. Federal State Statistics Service. Form no. 4-innovation "Information on innovation activities of organizations". 2019. Available at: https://rosstat.gov.ru/folder/14477# (accessed: December 4, 2021).

Table 2. Internal R&D expenditure in the Russian Federation, million rubles

Indicator	2016	2017	2018	2019	2020	2020 to 2016, %
Internal research and development expenditure, total	943815,2	1019152,4	1028247,6	1134786,7	832128,6	88.2
including agriculture, forestry, hunting, fishing and fish farming	529,0	568,5	357,8	319,1	150,1	28.4
The share of agriculture, forestry, hunting, fishing and fish farming in total costs, %	0,06	0,06	0,03	0,03	0,02	
Compiled according to: Federal State Statistics Service. Internal research and development expenditure (by type of economic activity). Available at: https://rosstat.gov.ru/folder/14477 (accessed: September 18, 2021).						

In the same year, agricultural organizations spent almost half as much on research and development of new products, services and methods of their production (transfer), and new production processes (25%). At the same time, agricultural organizations did not actually carry out organizational expenses such as planning, development and implementation of new business methods, organization of workplaces and organization of external relations, as well as personnel training and advanced training costs related to innovation activity.

Effective innovation development, in addition to creating general legal conditions for doing business and financing them, requires additional, specific conditions, such as financing education and R&D. *Table 2* shows internal R&D expenditure in the Russian Federation by type of economic activity "Agriculture, forestry, hunting, fishing and fish farming", as well as their share in total expenditure for the period from 2016 to 2020.

This information reflects a negative trend in the financing of science and innovation in the agricultural sector. Special attention should be paid to the rapid decline in the sector's indicators in terms of value and percentage: for example, the amount of costs for these purposes by 2020 decreased 3.5-fold, and their share at such small values – 3-fold. Naturally, in the current situation, it is of little use to talk about the size of the share of such costs in Russia's gross domestic product and compare the indicator with the national SDG indicator (9.5.1).

Thus, the analysis carried out, including the comparison of Rosstat data with the target indicators of the current program for development of agriculture in the innovation sector, has shown their inconsistency, which does not allow us to say that the tasks set are effective. However, given the low level of innovation activity in agribusiness organizations, reduction in the share of investments in fixed assets and R&D expenditure, we have to admit that the efforts of the state currently being undertaken to solve the problems of innovation development in the agricultural sector are not entirely successful. Obviously, the current level of scientific and technological development cannot contribute to the achievement of SDG 8 and SDG 9.

Regional features of legal regulation and promotion of innovation activity of agribusiness. Russia's regions, having their own industry specifics and priorities, are characterized by uneven development of various aspects of innovation processes. In the article, we consider regional innovation development features in the case of Stavropol Krai, an RF constituent entity specializing in agriculture.

Legal basis for innovation activity in Stavropol Krai (SK) agriculture is the SK state program "Development of Agriculture"; it is based on the principles of long-term goals of regional socio-economic development[24]. The priority direction

[24] On the approval of the state program of Stavropol Krai "Development of Agriculture": Stavropol Krai Government Resolution 620-p, dated December 28, 2018 (as amended on July 9, 2021). Available at: https://docs.cntd.ru/document/550317147 (accessed: September 17, 2021).

in the implementation of the state program is to develop and introduce state support measures in the form of subsidies and grants for development of innovation technology in agricultural production. The recipients of this type of state support are agricultural producers and agribusiness organizations, regardless of the scale of their activity and organizational and legal form. The most important regulatory documents executed in accordance with this program and aimed at the development of innovation activity in Stavropol Krai are as follows:

1. The procedure for granting subsidies at the expense of SK budget to reimburse part of the expenditure on supporting elite seed farming[25]. This event is included in the subprogram "Development of Crop Production" within the state program for development of agriculture in SK. The expected end result of this subprogram is the annual preservation of the share of areas (in the total share of crops) that are sown with elite seeds of agricultural crops at the level of 6%.

2. The procedure for granting subsidies at the expense of SK budget to reimburse part of the expenditure on supporting livestock breeding[26]. It is included in the subprogram "Development of Animal Husbandry" within the state program for development of agriculture in SK. The implementation of the event helps to preserve and increase the genetic potential of farm animals in the region. In accordance with the planned indicators under the subprogram, from 2019 to 2024, the increase in breeding brood stock will be 3.7% (from 57.2 to 59.3 thousand head).

It worth noting that these measures can contribute to the achievement of target 2.5 of SDG 2[27]. However, the national indicator to assess the solution of this problem is still being developed at the national level: 2.5.1 "Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities"[28]. Among the national indicators of the SDGs, indicator 2.5.2 "Proportion of local breeds used for agricultural production in the territory of the Russian Federation" has been monitored since 2018. Its value in 2018 was 93.5%, in 2019 – 93.4%[29]. These indicators can indirectly characterize the results of implementation of a scientific and technical program that initiates the development of innovation activity in the field of breeding and genetics.

The main documents governing and regulating activities in the innovation sphere also include the law of Stavropol Krai "On innovation activity in Stavropol Krai" aimed at creating favorable conditions for business, including state support for innovation, state assistance in the implementation of innovation projects and the development of innovation infrastructure[30].

Separately, we should note that since 2018, SK has been implementing an incentive measure providing for state support to reimburse part of the direct costs incurred for the creation and (or) modernization of regional agro-industrial complex

[25] On the approval of the procedure for granting subsidies at the expense of Stavropol Krai budget to reimburse part of the expenditure on supporting elite seed farming: Stavropol Krai Government Resolution 224-p, dated April 29, 2020. Available at: http://publication.pravo.gov.ru/Document/View/2600202005010012 (accessed: September 18, 2021).

[26] On the approval of the procedure for granting subsidies at the expense of Stavropol Krai budget to reimburse part of the expenditure on supporting livestock breeding: Stavropol Krai Government Resolution 437-p, dated December 15, 2010 (as amended on May 17, 2021). Available at: https://docs.cntd.ru/document/461504185 (September 20, 2021).

[27] SDG 2, Target 2.5: By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

[28] National set of SDG indicators. Federal State Statistics Service. Available at: https://rosstat.gov.ru/sdg/national (accessed: September 18, 2021).

[29] Ibidem.

[30] On innovation activity in Stavropol Krai: Law of Stavropol Krai 13-kz, dated March 11, 2004 (as amended on December 27, 2019). *KonsultantPlyus: Legal Reference System.* Available at: http://www.consultant.ru/ (accessed: October 10, 2021).

facilities. Thus, in accordance with the state program for development of agriculture in Stavropol Krai from 2019 to 2024, it is planned to modernize 12 facilities for crop production, one dairy livestock complex, one breeding and genetic center in poultry farming, and one sheep farm.

In 2019, the RF Ministry of Agriculture developed a departmental project "Digital Agriculture", which represents methodological recommendations to form an integrated approach to the introduction of a single mechanism of innovation technology both at the level of a single entity and the country as a whole. The main goal of the project is digital transformation of agriculture through the introduction of digital technology and platform solutions to ensure a technological breakthrough in the agro-industrial complex and achieve two-fold productivity growth at "digital" agricultural enterprises by 2024. Major activities under the project include collecting statistical data on the agro-industrial complex ("Single window"), providing information support and services to agricultural entities, creating a set of services "Effective hectare", "Land of knowledge" and "Traceability of agricultural products", the project "Digital agro-meteorological stations", as well as "Services based on public-private partnership" (including unmanned aerial photography and agro-meteorological monitoring of agricultural lands)[31]. Within the framework of the departmental project "Digital Agriculture", the Ministry of Agriculture of Stavropol Krai is implementing a set of measures for remote sensing of agricultural lands.

Thus, we can say that the conditions created in the region under consideration, in terms of normative regulation and promotion of innovation activity, are quite favorable for the growth of innovation activity of agribusiness. However, despite the efforts taken by the federal and regional authorities, according to a sample survey of Rosstat, the volume of innovation goods, works and services of agricultural organizations in Stavropol Krai in 2019 amounted to only two thousand rubles32; this fact raises many questions.

Problems in assessing the results of innovation development and achievement of the SDGs in the agricultural sector at the regional level. The analysis has shown that at present it is not possible to quantify the results of implementation of innovation policy in the agricultural sector of Stavropol Krai, because the continuous accounting of such indicators by type of economic activity at the regional level is not actually carried out.

In our opinion, a quantitative assessment of the results of implementation of innovation policy in the sector at the level of a particular region or company can be given only on the basis of indirect indicators and the findings of our own research. Indirect indicators include the results of statistical observations published by Severo-Kavkazstat (Rosstat regional office of North Caucasian Federal District) according to Form no. 4-innovation. Thus, the level of innovation activity in Stavropol Krai organizations in 2019 amounted to only 5.1%, having decreased by almost 4% in comparison with 2017. During the same period, the share of investments in machinery, equipment, and vehicles in the total volume of investments in fixed assets decreased. Thus, the general trend in innovation development, according to official statistics of Stavropol Krai, is negative. We can assume that similar dynamics are observed in the agricultural sector.

Regarding our own research, we should note that in 2020, while implementing a scientific project supported by the Russian Foundation for Basic

[31] *Departmental Project "Digital Agriculture": Official Publication*. Moscow: FGBNU "Rosinformagrotekh", 2019. 48 p.

[32] Results of federal statistical observations. Federal State Statistics Service. Form no. 4-innovation "Information on innovation activities of organizations". 2019. Available at: https://rosstat.gov.ru/storage/mediabank/4-innov.html (accessed: November 18, 2021).

Research, we conducted a survey of representatives of agribusiness in Stavropol Krai; the survey aimed to identify factors hindering the achievement of sustainable development in agriculture and rural territories of SK33. The questionnaire included questions that allow us to assess the level of use of innovation technologies and the factors hindering their implementation. After processing the data on the basis of a qualitative assessment of individual processes and phenomena, we obtained quantitative results that cannot be verified according to official statistical records data. As mentioned earlier, the questionnaire also included questions that helped to assess the awareness of the expert community regarding the term "sustainable development of the agro-industrial complex (agriculture, rural areas)", awareness of the adoption of the 17 goals of Agenda 2030 and their priority for agricultural producers in the region.

Figure 7 shows the distribution of respondents' answers to the question about the relevance of each of the SDGs to them (one answer option was allowed for each of the 17 SDGs). To provide a deeper understanding of the content of the SDGs, we supplemented them with our own comments. The results obtained indicate that SDG 8 is most relevant for the representatives of agribusiness; this goal includes tasks to improve production efficiency and labor productivity, create decent jobs, develop micro, small and medium-sized enterprises, entrepreneurship, innovation (73.2%). At the same time, 53.7% of respondents indicated that SDG 9, whose targets are aimed at promoting innovation, enhancing scientific research, and upgrading infrastructure, was also relevant.

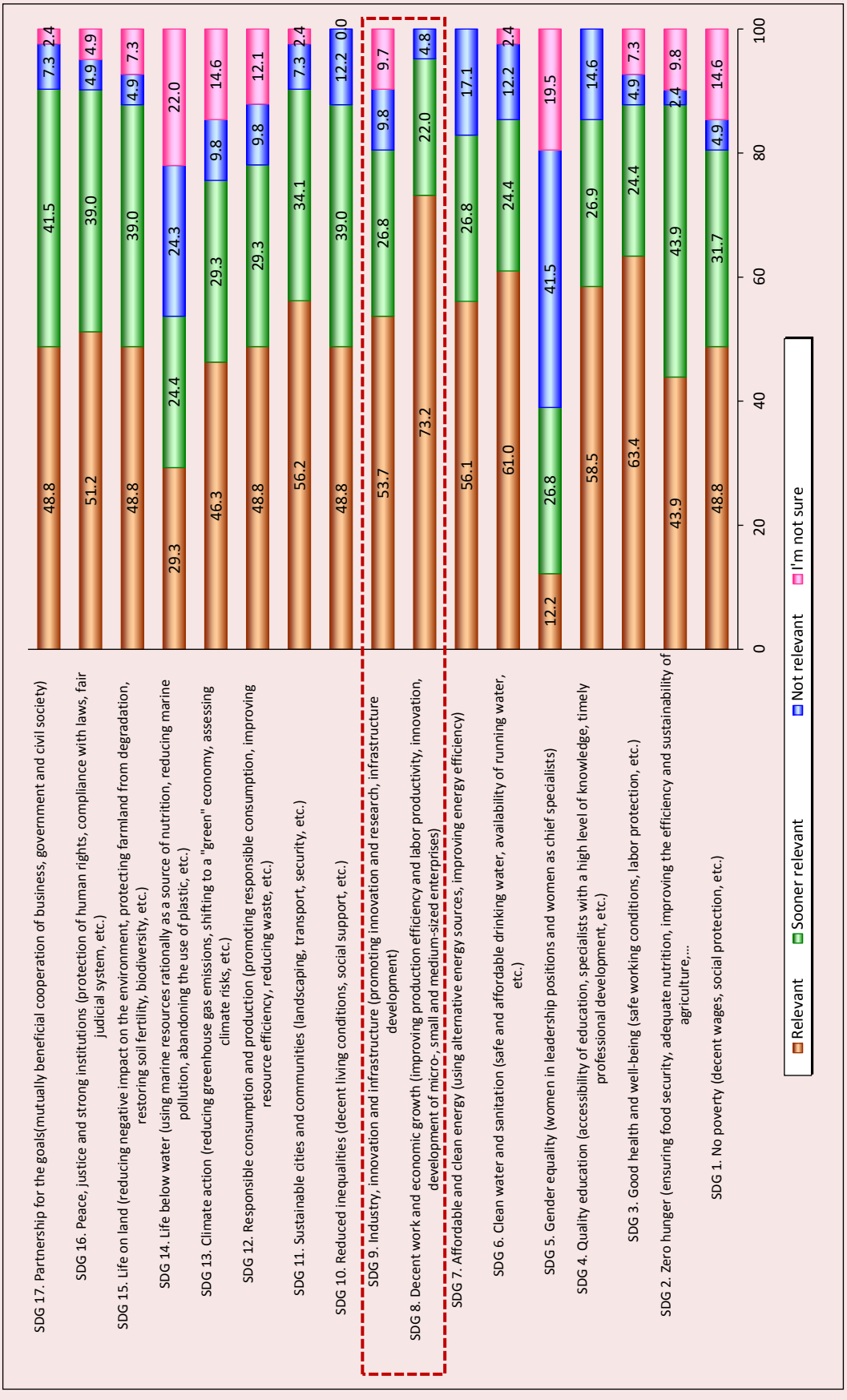
To enable a more detailed understanding of the content of each of the 17 SDGs, the questionnaire included a list of socio-economic and environmental problems that, as we believe, hinder the achievement of sustainable development in the agricultural sector. Thus, in the ranked row, the problem of insufficient state support ranked first (3.78 points on a five-point scale), followed by lack of funds for production modernization (3.46), outdated equipment and technology (3.15) and lack of funds for innovation (3.12).

The question "Does your farm take measures to raise the level of environmental safety of agricultural production, improve fertility and soil quality?" received an affirmative answer from 80.5% of respondents. When answering the question "What specific soil-saving technologies do you apply?", all respondents noted the scientifically substantiated alternation of crops (crop rotation), as well as introduction of organic fertilizers (76%) and the use of biological preparations (66.7%). While 38% of representatives of agricultural organizations and only 18% of farmers said they were using innovation technology.

Speaking about the reasons hindering innovation activity of agricultural producers, over 60% of experts highlighted the high cost of innovations, 17% pointed out the lack of their own funds, about 15% found it difficult to answer, and 5% pointed out the delayed effect of scientific and technological innovation.

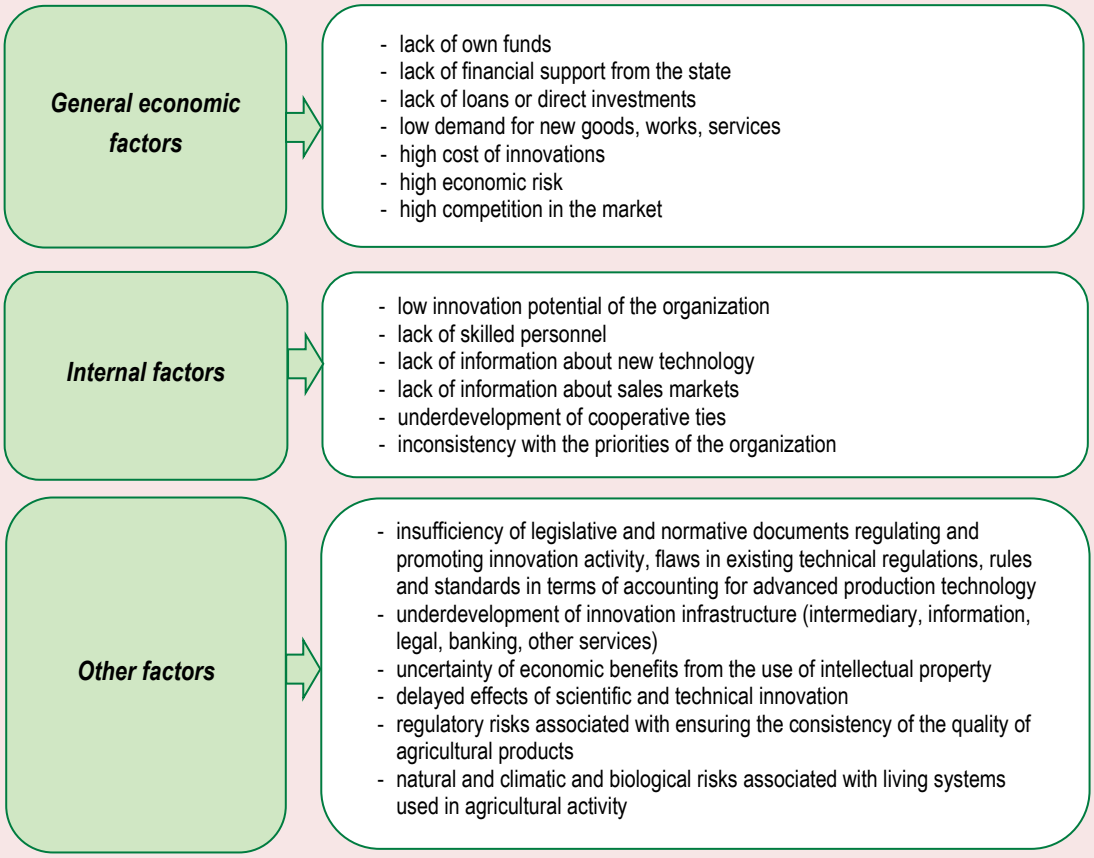
[33] Primary information was collected as follows: interviewers filled out questionnaires when conducting personal surveys at respondents' farms (organizations, peasant (farmer) enterprises); respondents could also fill out a questionnaire on their own via Google forms received by e-mail or mobile phone. The general population of the sample includes 463 agricultural organizations and 1,651 peasant (farmer) enterprises according to the register of subjects of state support for development of agriculture as of September 23, 2020. Sample size was 205 respondents from 26 municipal and urban districts. Thirty-six representatives of large, medium-sized and small agribusiness enterprises, as well as heads of peasant (farmer) enterprises from seven municipal and urban districts of the region, took part in the personal survey. The majority of participants in the expert survey were men (70.7%), the proportion of women was 29.3%. Depending on the age group, the proportions of respondents were distributed as follows: under 30 years old – 12.2%; 31–40 years old – 17.1%; 41–50 years old – 26.8%; 51–60 years old – 34.1%; over 60 years old – 9.8%. The fields of professional activity of respondents, taking into account basic education and in accordance with their position: agronomy – 34.1%, management – 26.8%, economics – 24.4%, mechanization – 7.3%, animal husbandry – 4.9%, plant protection – 2.4%.

Figure 7. Distribution of respondents' answers to the question about the relevance of the SDGs, % of respondents



Source: own elaboration.

Figure 8. Factors hindering the introduction of innovations in the Russian Federation



Source: Results of federal statistical observations. Federal State Statistics Service. Form no. 4-innovation "Information on innovation activities of organizations". 2019. Available at: https://rosstat.gov.ru/folder/14477 (accessed: September 18, 2021).

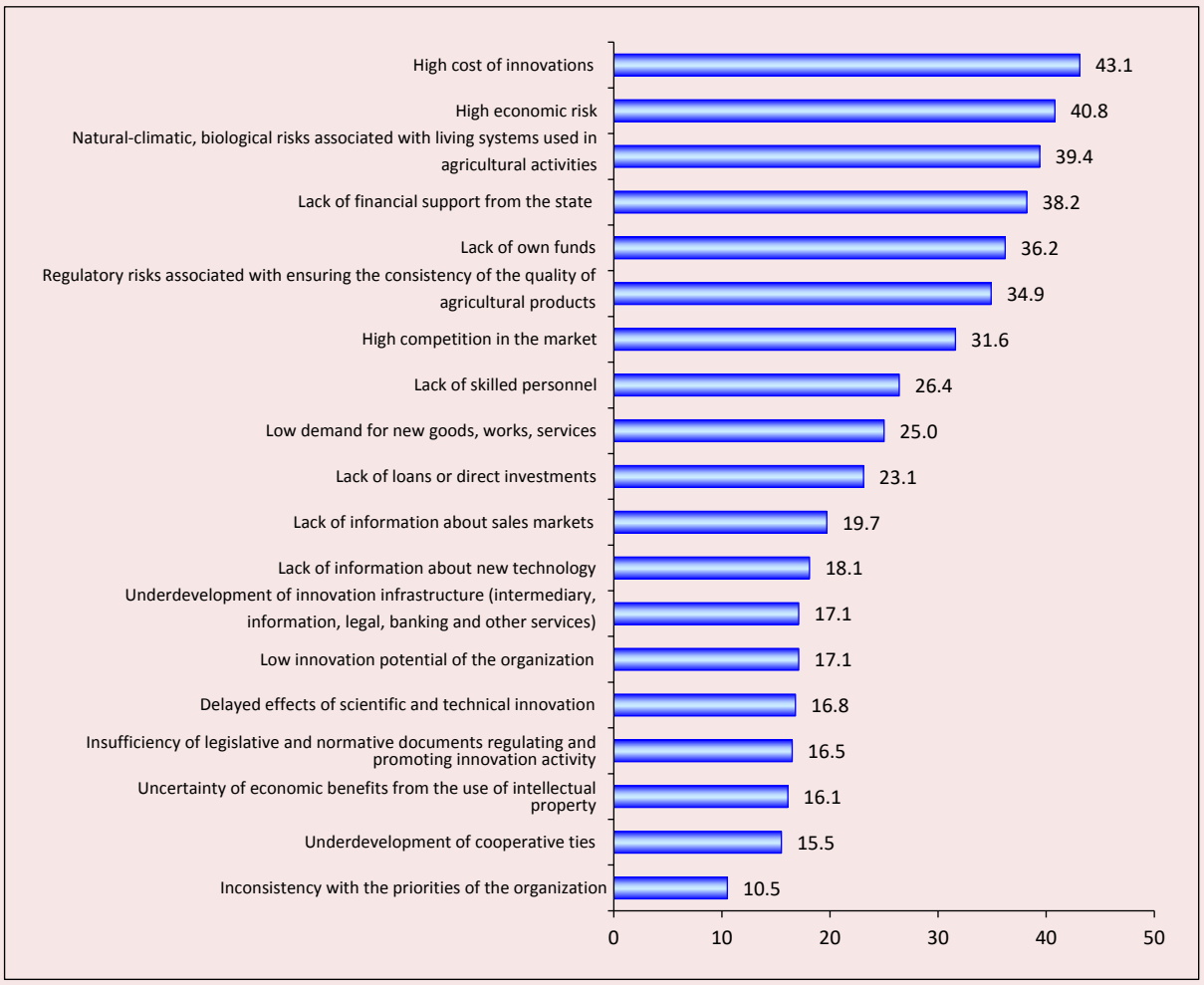
It is worth noting that the results of the survey of agribusiness representatives in Stavropol Krai partially coincide with the results obtained by Rosstat in 2019 according to a sample survey of RF agricultural organizations that assessed the factors hindering the introduction of innovation.

Figure 8 shows a list of general economic, internal and other factors included in the reporting for a sample survey of organizations that implement innovations.

Figure 9 shows a ranked number of major factors hindering innovation, according to representatives of agricultural organizations that implemented innovations and assessed the obstacles according to their significance as significant, major, or critical. We can conclude that most representatives of agricultural organizations do not complain about the insufficiency of legislative and regulatory documents that govern and promote innovation activities. Thus, the share of those who noted this factor among the obstacles is only 16.5%.

The underdevelopment of innovation infrastructure was indicated by slightly more respondents: 17.1%. The high cost of innovations and the high economic risk of their implementation in agribusiness were noted by 43.1 and 43.8% of representatives of agricultural organizations, respectively; insufficient financial support from the state – by 38.2%; lack of own funds for scientific

Figure 9. The share of agricultural organizations that implement innovations and assess the factors hindering innovation activity as significant, major or critical (2017–2019), %



Source: Federal State Statistics Service Results of federal statistical observations. Form no. 4-innovation "Information on innovation activities of organizations". 2019. Available at: https://rosstat.gov.ru/folder/14477 (accessed: September 18, 2021).

research and their implementation – by 36.2% of respondents; 26.4% of agribusiness representatives are concerned about the problem of attracting qualified personnel ready to engage in high-risk innovation projects.

Thus, based on Rosstat's available indicators and our own research findings, we can conclude that the level of scientific and technological development in the agricultural sector is insufficiently high and there exist many factors that hinder the growth of innovation activity in agribusiness. To date, it is difficult to give a more accurate quantitative assessment of the results of implementation of innovation policy at the level of a particular region or industry, since the specifics of statistical accounting and regional statistics provide very limited opportunities to obtain data from these sources. Experts agree that statistical data do not fully reflect the objective picture in innovation activity (Khmeleva, 2016).

The study has also revealed the lack of consistency of the target indicators of the current program for development of agriculture in the innovation sector with the indicators of Rosstat, and even more so with the priorities of the SDGs. Despite the fact that Rosstat is making great efforts to monitor the SDGs at the national level, and almost all official statistical information is developed regionally, at this stage it is not possible to assess the contribution of a particular region, industry or company to the achievement of the SDGs due to the absence of such indicators.

Conclusion

In the course of the study, we have found that in recent years the Russian government has been paying significant attention to innovation development, working on numerous strategic planning documents and measures to support innovations. However, current state policy in the field of innovation does not produce significant results; the basic indicators for the innovation sector – the share of innovation products, the level of business participation in research and development financing – are facing stagnation and even a decrease. It has to be stated that the indicators actually achieved during the implementation of the Innovation Development Strategy for the period up to 2020 are significantly lower than the established target indicators.

Our analysis of the degree of consistency of strategic planning documents on innovation development with the targets of SDG 9 and SDG 8 has shown that their tasks in an adapted formulation are integrated into existing policy and regulatory documents. Meanwhile, the analysis of the national indicators of SDG 9 (Innovation and Science) for 2011–2019 has revealed negative dynamics in most of them. We have also established that monitoring and assessing the degree of achievement of innovation-oriented SDGs is significantly complicated by many inconsistent indicators in strategic planning documents and Rosstat data.

Having assessed the effectiveness of current state policy in the field of innovation activities of agribusiness, we reveal a low level of innovation activity of organizations, a reduction in the share of investments in fixed assets and expenditure on science and development; this allows us to say that the efforts of the state in this area are not entirely successful. Comparing the target indicators of the current agricultural development program in the innovation sphere with Rosstat data and the priorities of the SDGs has shown their inconsistency. Despite the complexity of the assessment, it is obvious that the negative dynamics of indicators and the current level of scientific and technological development of the agricultural sector cannot contribute to the achievement of SDG 8 and SDG 9.

Addressing the tasks set in the study, we looked into the regional specifics of normative and legal regulation and promotion of innovation activity of agribusiness on the example of Stavropol Krai, an RF constituent entity specializing in agriculture.

Despite the fact that, in general, the conditions created in the region are quite favorable, our assessment allows us to conclude that the level of scientific and technological development of the agricultural sector is not high enough and there are many factors hindering the growth of innovation activity of agribusiness. This conclusion is based on the results of our survey of agribusiness representatives. Its results indicate that agricultural producers are most concerned about the problems of insufficient state support, obsolescence of equipment and technology, high cost of innovations, lack of own funds for production modernization and innovation activity, and the delayed effects of scientific and technical innovations. At the same time, only about a third of representatives of agricultural organizations and a fifth of farmers said they were implementing innovation technology. At the same time, despite many hindering

factors hindering the introduction of innovation, representatives of agribusiness consider innovation-oriented targets of the SDGs to be relevant.

Thus, all of the above does not confirm our hypothesis that the state policy aimed to promote innovation activity of Russian agribusiness does not contribute to the formation of key innovation trends in its development in terms of sustainability and achievement of the UN SDGs.

Obviously, in order to achieve further progress toward the implementation of Agenda 2030, it will be necessary to develop a number of key measures, namely, to improve the system for evaluating and monitoring the indicators, because without them it would be impossible to set development goals correctly and achieve them.

The study has also revealed that today it is difficult to evaluate the results of implementation of innovation policy at the level of a particular region so as to compare them with the SDG indicators, since the opportunities provided by regional statistics are very limited. Therefore, in the current conditions, it is necessary to increase the level of consistency in the implementation of the goals of Agenda 2030 and in the assessment of their achievement; in particular, it is necessary to include the SDG targets and indicators in strategic planning documents at various levels more comprehensively and to monitor them, as well.

To do this, it will be necessary to revise the organization of strategic and program planning processes and ensure that the composition of indicators characterizing the goals and targets of the SDGs correspond to their values and are consistent with those stated in strategic development documents. At the same time, it is recommended that Rosstat should monitor such indicators and use them to assess the effectiveness of execution of strategic tasks. In addition to the national system of indicators for assessing the achievement of the SDGs at the level of region, sector or business, it will be necessary to develop secondary indicator systems resulting from the transformation of primary indicators of strategic planning documents at the federal, sectoral and regional levels.

Thus, the inclusion of certain targets of SDG 8 and SDG 9 in state, sectoral and regional programs for scientific and technological development and their comprehensive achievement will contribute to the development of the country's innovation potential. At the same time, a system of indicators consistent with the targets of documents on the strategic development of agribusiness in the innovation sector will help to monitor and assess the effectiveness of the targets set, and forecast scientific and technological development. In turn, enhancing the level of scientific and technological development of the agricultural sector will contribute to the achievement of the SDGs.

The novelty of our research lies in the development and implementation of our own approach to determining the degree of consistency of the targets of existing programs and strategies for development of agribusiness in the innovation sector with the priorities of the SDGs.

Practical recommendations and the main conclusions of our study can be used by scientists in their research on similar topics, by federal and regional authorities in the course of substantiating adjustment measures aimed to improve state policy in the field of enhancing innovation in the agricultural sector and implementing the targets of Agenda 2030.

Taking into account the recommendations we have highlighted, the task for the next stage of work on this topic will be to develop a system of indicators for monitoring and assessing the achievement of all 17 SDGs in the national agri-food system, including innovation-oriented SDGs.

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