

# Innovative platform for economic transformation agricultural sector of the Russian economy

*T.I. Nasedkina*<sup>1</sup>, *A.I. Chernykh*<sup>1</sup>, and *L.A. Molchanova*<sup>2,\*</sup>

<sup>1</sup>Belgorod State Agrarian University named after VYa Gorin, Belgorod, Russia

<sup>2</sup>Russian Academy of Entrepreneurship, Moscow, Russia

**Abstract.** The situation has developed in such a way that the development of any country in the world is impossible without the introduction of new technologies. However, a simple technological upgrade of individual enterprises or even industries may not create an economic system specializing specifically in innovation. Such a system should be based on institutional provisions that would encourage economic entities to reproduce their activities on the basis of modern technologies and innovations. As practice shows, in agriculture, the innovative way is the only possible one in modern conditions. This trend is primarily due to the fact that land resources are not unlimited, and labor is declining from year to year. Therefore, further growth in production volumes is possible only on the path of innovation and investment development. It is proved that the policy of territorial innovation clusters, the implementation of which contributes to the strengthening of positive institutional effects on an innovative basis, affects the harmonious innovative development of agricultural enterprises.

## 1 Introduction

The agro-industrial complex is one of the most important links of the national economy of Russia, and the innovative way is the only possible one in modern conditions. This is primarily due to the fact that land resources are not renewed naturally, and labor resources have a rapid tendency to decrease. Therefore, further growth in production volumes is possible only on the path of innovation and investment development.

From a practical point of view, the introduction of new or improvement of existing innovative components to the market is laid in breeding and seed production, plant, animal and bird protection products, veterinary medicine, forms of management, social and household services in rural areas.

From the point of view of the objects of innovation involved in production processes, innovations in the agro-industrial complex are "... processes that directly affect innovations, the participants of which are people, machines and equipment, as well as elements of the

---

\* Corresponding author: [milan7777@rambler.ru](mailto:milan7777@rambler.ru)

biosystem, the existence of which in the natural environment is impossible or possible only with the loss of basic functional characteristics" [5]

Based on internal and external relationships and interactions in agro-industrial production, agro-innovations are divided into groups:

- 1) "...innovations aimed at improving the objects interacting in the production process:
- 2) innovations aimed at improving interactions within the agricultural production system:
- 3) innovations aimed at improving interaction with the external environment of agribusiness functioning" [3].

Practice shows that innovative processes in the agro-industrial sector are endowed with special specifics, where a distinctive feature is the diversity of regional, sectoral, functional, technological and organizational components. The designated tools certainly determine the directions and requirements in the development of innovative tools, including marketing, management, innovation infrastructure, etc.

Also, agricultural innovations in comparison with innovations in other sectors of the economy are distinguished by: a long development process and mainly improved nature, research of living organisms, the leading role of research institutes, dependence on the natural zone and climate, etc.

This trend is explained, first of all, by the peculiarities of agriculture itself, when the main factors of production are land, interaction with living organisms (plants, animals, microorganisms), seasonal nature of production, a high level of risk.

However, the development of the innovative component in agriculture plays an important role, therefore, maximum assistance to their various types, both at the federal and regional levels, will ensure a large-scale, comprehensive and continuous innovation process.

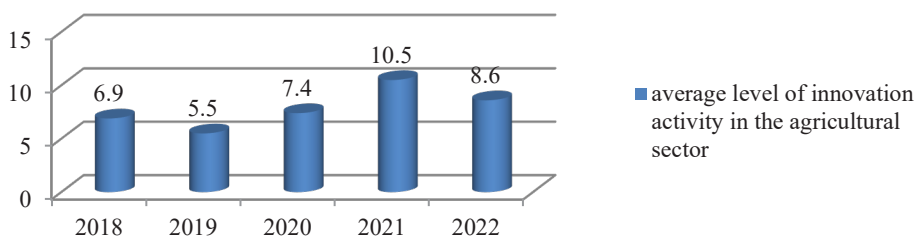
According to the Federal Statistics Service of the Russian Federation, the average level of innovative activity of the agricultural sector has increased by 1.7 times over the past 5 years (Table 1). Among the types of economic activity in agriculture, directions in the field of growing annual crops and animal husbandry dominate. If we consider the innovative development in mixed agriculture as a whole, the indicator of innovation activity by the end of 2022 amounted to 9% of the total volume, while food production accounted for 12.9% over the same period.

**Table 1.** Innovation activity by types of economic activity of the agricultural sector of the Russian Federation for (2018-2022), (% in total)

<i>Indicators</i>	<i>years</i>					<i>Deviation</i>	
	2018	2019	2020	2021	2022	(+;-) 2022- 2018	(%) 2022- 2018
Cultivation of annual crops	4.0	4.8	7.1	8.8	8.6	4.6	+15
Cultivation of perennial crops	1.4	2.4	4.8	5.7	3.6	2.2	↑2.5
Growing seedlings	5.6	5.0	8.7	13.3	7.7	2.1	+37.5
Animal husbandry	4.2	4.0	7.5	8.6	8.9	4.7	↑2
Mixed agriculture	9.4	2.8	2.5	6.8	9.0	-0.4	-4.3
Food production	14.2	12.0	13.4	16.9	12.9	-1.3	-9.1
Beverage production	10.1	7.9	8.4	13.9	10.1	-	-
The average level of the agro-industrial complex	6.9	5.5	7.4	10.5	8.6	1.7	+24.6

*Source: compiled by the authors based on data from [15]*

The average level of industry innovation activity for all types of economic activity in the agricultural sector for 2018-2022 increased by 1.7 percentage points or by 24.6%



**Fig. 1.** The average level of industrial innovation activity of the agro-industrial complex for (2018-2022) (in total volume, %)

Source: compiled by the authors based on data from [15]

According to rating agencies, the innovative activity of the domestic agricultural sector, despite the leadership in the export of a number of products, is one of the lowest, ranking 26th out of 30 possible in 2022, when mechanical engineering, electronics and computer technologies are the leaders.

Consequently, the transformation and modernization of agriculture, entering the path of innovative development of production capable of competing in the international market, moving away from raw grain exports to exports of value-added products, as well as technologies, will ensure growth in the domestic and foreign markets.

*The purpose of the article is to assess the directions of promising innovative formation of production by enterprises of the agricultural sector of the economy at the present stage of institutional changes.*

## 2 Materials and methods

The methodological basis of the research is the synthesis of the results of fundamental and applied research of domestic and foreign scientists on the problems of innovative development of the agricultural sector and the formation of directions for its improvement. The methods of theoretical and empirical research are applied in the study.

## 3 Results

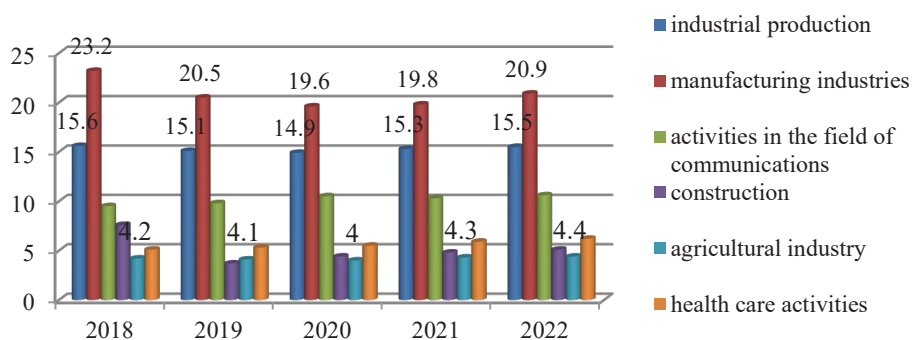
Currently, the situation is developing in such a way that the directions of the innovative component in the domestic agricultural business have not received proper development and are a systemic problem. Work in the field of innovative agricultural technologies is certainly underway, and, nevertheless, its level is recognized as insufficient. In particular, they are missing or require improvement:

- monetization and capitalization of developments;
- an infrastructure system of the innovation market in agriculture, capable of providing an operational and efficient transfer of innovations;
- modernization of management and marketing in the production of high-tech products;
- formation of a sufficient level of financing of agricultural science [1].

These measures contribute to improving the competitiveness of the industry and increasing the welfare of the population.

Acting as a determining condition for ensuring the efficiency of production processes in the agricultural business, innovative infrastructure forms a competitive environment in the innovative sector of the economy, develops and supports innovative entrepreneurship, motivates business entities to innovate, protects intellectual property rights, forms an individual approach to innovative companies and innovative projects of agro-industrial enterprises [14].

At the same time, despite the low innovative activity of representatives of the agricultural sector (Fig. 2), there has been a positive growth trend (Table 2).



**Fig. 2.** The level of innovation activity of Russian organizations by type of activity (2018-2022., %) *Source: compiled by the authors based on data from [15]*

The analysis data show that the volume of innovation costs is dominated by the companies' own funds, which account for about 30%.

**Table 2.** Costs of innovative activities in agriculture by sources of financing (2018-2022, billion rubles)

A source	years					Deviation 2022-2018	
						(+;-)	%
	2018	2019	2020	2021	2022		
Total costs of innovation activities	21960.5	27643.8	33789.3	49393.2	54247.7	32287.2	247.0
Organizations' own funds	10008.2	12554.2	14327.4	21196.6	21556.7	11548.5	215.3
Federal budget	1029.4	1886.5	2218.4	2679.4	2833.6	1804.2	275.2
Budgets of constituent entities of the Russian Federation and local budgets	141.3	176.4	197.5	205.3	250.7	109.4	177.4
Foreign investments	78.2	123.7	164.9	231.3	258.9	186.7	331.0
Other funds	10703.4	12903.0	16881.1	25080.6	29347.8	18644.4	274.1

*Source: compiled by the authors based on data from [16]*

The level of budget funds for similar items is about 5%, and foreign investors annually invest 3-4%. At the same time, the country's budget annually lays down up to 3.2 trillion rubles to finance the agro-industrial complex, but about 2-3% is allocated to innovative areas.

The innovative infrastructure makes it possible to implement the modern concept of creating a new generation of production systems, the so-called innovation pipeline, according to which the process of accelerated creation and implementation of various innovations takes place [4].

The role of innovation infrastructure is to observe the principle of unity of intellectual, social, political and economic spheres, as well as managerial, financial and economic, scientific and technical, social and personal components. Innovative infrastructure provides information, legal, organizational and economic support to the subjects of innovative activity [10].

Consequently, the formation of effective innovative development is a way that is based on deepening the complex of certain functions of an agro-industrial enterprise, its subsystems, the goals of each individual working in a team, improving its activities, improving business processes to solve common strategic tasks (achieving goals).

## 4 Discussion

The issues of innovative development of enterprises in the context of institutional transformations within the boundaries of the agricultural sector of the economy are reflected in the works of Russian scientists G.V. Berezhnov, A.P. Agarkov, A.A. Alekseev, Yu.M. Belyaev, O.V. Khotyashev and a number of others. The general methodological foundations for building an institutional framework for innovative development are also revealed in the concepts of Western economists.

In particular, it is necessary to mention the ideas of I. Schumpeter about competition as the main factor in the economic development of corporations based on innovation; the concept of cluster structures by M. Porter; the concept of technological systems, which was considered by J. Dossi, N. Rosenberg; the concept of National Innovation Systems, initiated by K. Freeman, R. Nelson, B.-A. Lundvall.

Nevertheless, despite a significant number of scientific papers on the issue under study, there is a need for constant monitoring of innovation trends - to identify, analyze and solve problems of innovative development of enterprises in the agricultural sector of the economy, taking into account the mechanisms of institutional action mediated by certain institutions.

The development of the agricultural sector of the Russian economy, being in the process of evolution, is accompanied by constant systemic transformations of an institutional nature, in particular:

- the stage of transformation into a market environment (1991-1999);
- the reformation stage (2000-2009);
- the stage of adaptation in the conditions of Russia's membership in the WTO (2010-2014);
- the modern stage of significant external influence (from 2014 to the present).

Each stage of change in the institutional environment, having clear time boundaries, is characterized by certain institutional features, but differs in the effectiveness of production and economic activities of enterprises of the agricultural sector.

In this case, it is necessary to form fundamentally new models and methods of development of economic entities based on:

- introduction of advanced technologies and techniques, as well as management systems;

- an integrated approach in the field of development and implementation of innovations;
- ensuring progressive innovative changes and reorientation to an innovative type of development [2].

These measures, in turn, will contribute to increasing labor productivity, saving costs, reducing the cost of agricultural products, and improving economic efficiency in the long term.

The innovative way of development, in turn, will allow:

- to create favorable market conditions for the implementation of institutional reforms in the agricultural sector of the economy, taking into account the current challenges of globalization;
- focus efforts on ensuring the country's food security, as well as the realization of the competitive advantages of the domestic agricultural sector and the formation of a competitive producer of agricultural products;
- the revival of investment activity as the primary basis of innovative renewal of means of production, increasing labor productivity, as a result, increasing the volume of agricultural production.

The impact of institutional changes on the regulation of entrepreneurial activity includes a system of basic and derivative institutions, traditions, organizations and institutions whose task is to determine the behavior of business entities [6].

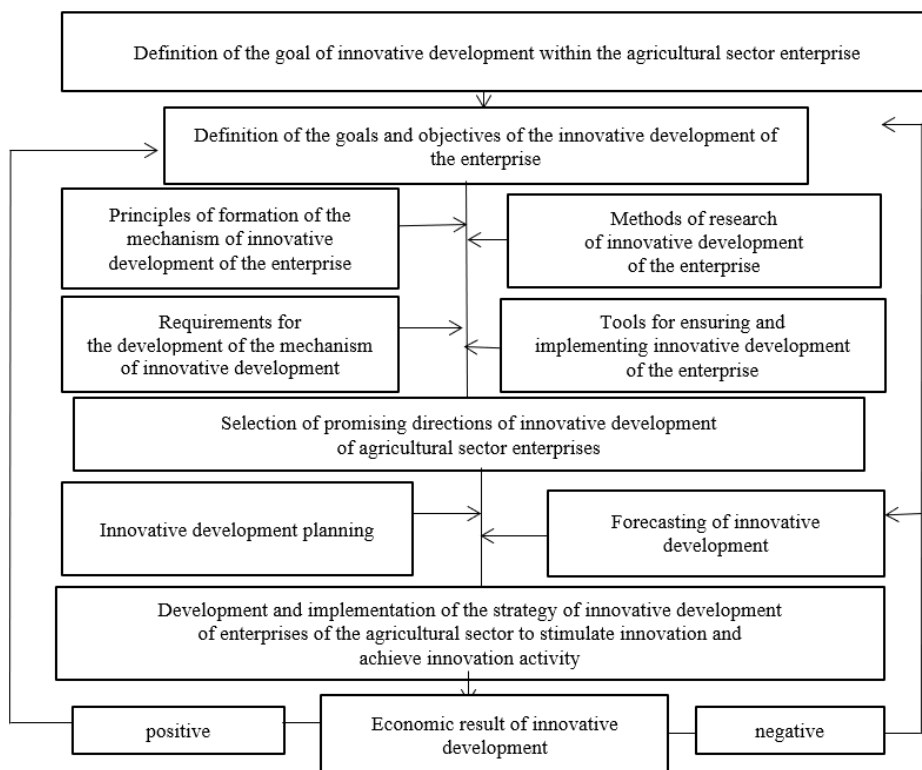
In addition, the activation of innovative activity of agricultural sector enterprises in the transition period from the industrial to the post-industrial economy is influenced by the integration processes of research and production. In this case, the effectiveness of innovation processes in the agricultural sector depends on the support of representatives of the state and non-state sector, regulatory, intellectual, human, resource, financial and investment support for innovation, etc.

In this case, the institutional mechanism is based on the concept of institutional development of innovation activity (Fig. 3), the study of which should be carried out on the basis of an innovative mechanism for the development of enterprises in the agricultural sector. The designated concept includes the goals, objectives of innovative development, principles of formation, research methods, support tools, as well as the choice, development and implementation of a strategy for harmonious innovative development with the determination of the economic result of implementation.

It should also be noted that the institutional mechanism is inextricably linked with the concept of "institution", which establishes rules and restrictions in activities where the main burden of formalized rules and restrictions is placed on the state, after which the process of implementation into daily activities takes place.

The subjects of interaction within such a mechanism in the agricultural sector of the economy are usually enterprises of various organizational and legal forms of management within integrated structures.

In our opinion, at the level of economic entities, the process of organizing an institutional mechanism for innovative development should consist in implementing the policy of forming innovation clusters and institutional infrastructure mechanisms that support innovative processes in the business environment. In this case, as international experience shows, it is cluster structures that are more actively involved in cooperative ties and institutional relations of interaction [12].



**Fig. 3.** The scheme of functioning of the mechanism of innovative development of enterprises of the agricultural sector

Source: compiled by the authors

In addition, acting as the most effective form of production and economic activity, clusters have a high degree of adaptability, the ability to flexibly and promptly respond to economic, institutional and market changes [8].

The functioning of clusters is carried out on the basis of the unification of separate, but interconnected by territorial and/or technological characteristics of economic entities engaged in production, scientific, educational, consulting, trade and other activities. The interaction of these economic entities forms the advantages of clusters due to the realization of the competitive potential of their participants. The basis for the formation of clusters is the development and strengthening of horizontal ties between participants, maintaining the necessary level of trust [13].

The development of clusters in the agricultural sector, as a rule, is aimed at solving problems related to increasing the competitiveness of the domestic economy and the intensification of public-private partnership mechanisms [9].

For example, in the concept of the development of the domestic agrarian economy, the agro-industrial cluster is defined "... as a system of interrelated forms of organization of activities (agricultural enterprises, personal subsidiary farms, peasant (farm) farms, etc.) integrated for simultaneous and interrelated solutions to environmental protection problems and the introduction of innovative technologies into production that turn "waste" into resources effective development of agriculture. In such integrated structures, the

effectiveness of interaction between business entities depends on the choice of the relationship model, as well as the institutional and economic principles of their functioning" [7].

In solving issues, their equally important results are the integration of business, the state and education, which requires competent organizational and managerial decisions, the implementation of PPP mechanisms and the coordination of the interests of various subjects of economic relations.

The three traditional spheres are the state, business (entrepreneurial environment) and universities (educational environment), which, during the implementation of cluster policy on the formation of a model of cluster organization of agribusiness, cease to perform only their traditional functions and begin to implement the functions of other spheres, called the triple helix [11]. At the same time, the role and order of interaction of such institutions varies depending on the nature of the social formation. The triple helix can be considered both in the interaction between institutional spheres (universities, business and the state), and as spaces, among which are knowledge, conventions, innovations.

It should be noted that the created formations of the agrarian cluster type make it possible not only to maintain the competitive advantages of individual micro-level economic entities, but also to create a synergistic effect in the process of their functioning.

In turn, the formation of clusters contributes to the development of spatial advantages, creating a cumulative effect that contributes to the emergence of new organizations and enterprises.

## 5 Conclusion

According to the research results, we note the need for institutional transformation in the field of innovative development of the agricultural sector, the trend of which will increase the efficiency of agricultural producers, create a favorable competitive environment and create a mechanism for the future that stimulates internal and external factors that determine the further vector of innovation activity.

The analysis of investments in innovation activities from various sources indicates the dominance of agricultural producers' own funds in the total volume, which account for up to 30% of resources, while budget funds have volumes of 2-3% of the total financing of the entire agricultural sector. At the same time, the innovative component of the agricultural sector is a priority not only for agricultural producers, but for the state as a whole.

At the beginning of 2020, the Government of the Russian Federation approved a Strategy for the development of agro-industrial and fisheries complexes, but in September 2022, the Government of the Russian Federation made changes that will directly respond to all new challenges and threats. One of the key changes is the need to improve the indicators of annual sustainable production growth at the level of 3%, according to various estimates, such results can be achieved with annual financing in the amount of 900 billion rubles, of which about 20% should be directed to innovative activities.

The strategy assumes to have at least 13.2 million hectares of land by 2030, which is directly related to the expansion of territories in favor of agriculture, the issue of financing in this situation is a key point. In addition, according to the strategy scenario, in 2024, agricultural exports should range from \$29 billion to \$31 billion.

Consequently, the mechanism of effective institutional support of innovative development in agriculture should include interests between the authorities, business entities and society, since the agricultural sector is a complex of vertical and horizontal links in the internal structure and a network of interactions with the external environment. It should be noted that this system of interactions is predetermined by the specifics of the agrarian institutional mechanism, which should take into account the development priorities



of both individual groups of agro-industrial enterprises, as well as the agricultural sector and society as a whole.

## References

1. O.S. Akupiyan, I.A. Demesheva, D.P. Kravchenko, L.A. Molchanova, et al. *Innovative development of agro-industrial enterprises* (Kollektivnaya monografiya: Izd-vo Belgorodskij GAU im. V.YA. Gorina, 2021) 260. (In Russ.)
2. V.I. Berezhnoy, *Applied scientific research: economics and innovative management technologies* (M.: RUSANS, 2018) 65. (In Russ.)
3. N.E. Astashov, *Organization of agricultural production* (M.: Academic project, 2014) 773. (In Russ.)
4. S.A. Dzhavadova, L.A. Molchanova, *Journal of Applied Research* **2**, 46-54 (2021) (In Russ.)
5. G.G. Yeletsikh, *Issues of innovative economy* **4**, 152-179 (2015) doi:10.18334/inec.5.4.2105. (In Russ.)
6. P.I. Ivantsov, *Innovative economy* (M.: DICTA, 2015) 42. (In Russ.)
7. M.M. Kandrovka, *Engineering Bulletin of the Don*, **3(37)**, 116 (2015) (In Russ.)
8. P.A. Levchaev, *Innovative model of regional economic development*, monograph (M.: INFRA-M, 2018) 92. (In Russ.)
9. E.V. Popov, *ECO*, **9**, 96 (2022) (In Russ.)
10. I.G. Ushachev, A.V. Kolesnikov, *Standards and quality* **7**, 16 (2022) (In Russ.)
11. E.A. Shabelnikova, *Bulletin of the Institute of Economic Research*, **4(8)**, 78-85 (2017) (In Russ.)
12. F.K. Shakirov, *Organization of production at agricultural enterprises. Vulture of the Ministry of Agriculture* (M.: KolosS, 2019) 650. (In Russ.)
13. S. Sharipov, *The economics of agriculture in Russia*, **5**, 47-54 (2017)
14. I. Schumpeter, *Theory of economic development (Research of entrepreneurial profit, capital, interest and the cycle of conjuncture)* (M.: Progress, 1982) 244.
15. Federal State Statistics Service. [electronic resource].-Access mode: <https://rosstat.gov.ru>
16. Ministry of Agriculture of the Russian Federation. [electronic resource].-Access mode: <https://mcx.gov.ru>