Methodological approaches to the evaluation of innovative projects in the agribusiness

Tatiana Marinchenko

1Russian Research Institute of Information and Feasibility Study on Engineering Support of Agribusiness (Rosinformagrotekh FSBSI), 60, Lesnaya Str., Pravdinsky Township, 141261 Moscow Region, Russia

Abstract. The main goal of the development of the Russian agribusiness at the present stage is to ensure the competitiveness of products, which, in the context of the rapid development of technology, can be ensured by the modernization of agricultural production based on the latest scientific achievements. At the same time, global and national priorities are changing, and the need to align business processes with the principles of sustainable development is becoming more acute. These processes lead to the need to develop methods for evaluating innovative projects, taking into account these changes. To solve specific problems and achieve development goals in Russia, project management is used, in which projects are selected and financed within the framework of state programs. When evaluating projects in the Russian agribusiness, the expert and scoring evaluation method is mainly used. The methods of selection of innovative projects used in the world practice are studied. New criteria for evaluating innovative projects have been proposed.

1 Introduction

The main goal of the Russian agribusiness scientific and technological development is to ensure the competitiveness of Russian products in the foreign and domestic markets primarily through the creation, dissemination and application of the latest achievements of science and technology, i.e. innovation [1]. They are the basis and necessary condition for the progressive development of the material, technical and technological bases of agricultural production.

The issues of effective development of agribusiness and ensuring the country's food security are invariably among the priorities of state policy [2]. Tasks were set to ensure the implementation of conditions for the development of scientific and scientific and technical activities; the implementation of conditions for the creation of technologies, products and services that will ensure the independence and competitiveness of agribusiness; organization of high-performance, efficient and resource-saving production. The main area of the agribusiness development is the introduction of innovations, since they have become a determining factor in development and competitiveness [3]. In addition, the introduction of domestic innovations makes it possible to implement and develop the accumulated scientific

* Corresponding author: 9419428@mail.ru

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and scientific and technical potential of the country, which is still involved in turnover to a small extent [4].

Currently, the project management is a universal approach to achieving strategic goals, both at the level of enterprises and at the level of industries and the country's economy as a whole [5]. The number of factors affecting the efficiency of the functioning of enterprises and industries has increased, the speed and degree of their influence have changed, and cumulative effects of the interaction of these factors have appeared. The total amount of information required for analysis has increased, and the need to process and structure it in a timely manner is becoming critical. In addition, today it is necessary to harmonize the development strategies of enterprises and industries with the concepts, priorities and development strategies of the state.

The development of agribusiness based on knowledge and innovation is the only way for its further effective development and positioning in the global market. The new technological reality has led to a fundamental change in business processes and development strategies, so the definition of new approaches to creating effective tools for selecting innovations in agribusiness is becoming necessity [6].

2 Methodology

The study object is innovative projects; the study subject is methods for evaluating innovative projects. The purpose of the work is to increase the efficiency and competitiveness of agricultural producers by defining new criteria for evaluating innovations in agribusiness, promoting their informed choice and further implementation.

The sources of information were the official websites of the Ministry of Agriculture of Russia and Russian Federal State Statistics Service, analytical materials of agencies, as well as scientific publications of specialists in the field of the study. In the process of the study, general scientific methods of cognition of phenomena and processes of an economic nature were used, such as synthesis, analysis and concretization, as well as the method of monographic research.

3 Results and Discussion

According to the latest statistics, the level of innovative activity of organizations reached 8.1% in agriculture in 2021, which was two times higher than that in 2016 (4%) being the first year of statistical observation, and by 23% higher than the level of 2020 (6.6%) [7]. However, in the context of the introduction of sanctions, restrictions and barriers against Russia, it is necessary to intensify the innovative activity of agricultural enterprises, which increases the need for the selection of effective innovations to increase the level of the availability of process equipment in agricultural industry and ensure the possibility of accelerating its upgrading. Innovations are implemented in the form of innovative projects that feature specific comparable characteristics.

In world practice, there are several approaches to comparing projects in the innovation sphere, which are based on comparisons according to some significant criteria, such as assessing the degree of innovation, costs and profits, risks, etc. (Table 1) [8, 9].

<table>
<thead>
<tr>
<th>Approach description</th>
<th>Essence of approach</th>
<th>Possible methods for evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment of the degree of project innovativeness</td>
<td>Depending on the criteria, projects may have different cost and profit potential</td>
<td>Technology Readiness Level (TRL) Analysis, Innovation Potential Matrix (IPM): is a...</td>
</tr>
</tbody>
</table>

Table 1. World-used approaches to the comparison of innovative projects.
method for quantifying the innovative potential of an organization

<table>
<thead>
<tr>
<th>Estimating costs and potential benefits</th>
<th>Projects have different cost and profit potential that can be compared</th>
<th>Return on Investment (ROI) / Net Present Value (NPV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk and uncertainty assessment</td>
<td>Risk is a common factor in innovative projects that plays a role in decision making</td>
<td>Monte Carlo method / Sensitivity Analysis</td>
</tr>
<tr>
<td>Assessment of strategic importance</td>
<td>Projects may have different strategic value in the context of the goals set</td>
<td>Project Matrix) / (Portfolio Analysis)</td>
</tr>
</tbody>
</table>

When selecting projects within the framework of state programs, development institutions, support funds, as well as large agricultural producers, it becomes necessary to select innovative projects of different areas of implementation and different types, i.e. heterogeneous projects. Each innovative project will be unique, therefore, to compare heterogeneous projects in agriculture, several approaches can be used:

- Determination of specific comparison criteria: in order to compare projects, it is necessary to precisely define the criteria by which they will be evaluated. Criteria may include potential profit, degree of innovation, risks, required resources and other factors,
- Using comparison methods: projects can be compared using various methods such as ROI (Return on Investment), NPV (Net Present Value), sensitivity analysis or Monte Carlo method. The choice of a specific method depends on the goals and characteristics of the projects,
- Project prioritization: projects can be prioritized based on their strategic importance and the company's long-term goals in agriculture,
- Analysis of the current state and comparison with the project of sub-sectors: analysis of how each of the projects correlates with the current situation and requests of the sub-sector, and determining the most effective ones [10-12].

Each of these approaches may use a number of methods to evaluate and compare projects. The choice of specific methods depends on the project features and the objectives of the evaluation. For example, a model may be created within the Monte Carlo method that describes the likelihood of various possible scenarios, and then a large number of random experiments may be run to understand which outcome is most likely. Identifying potential risks and identifying mitigation scenarios will also help compare heterogeneous projects.

An assessment of strategic importance can be useful when comparing projects with different strategic goals. As part of a portfolio analysis, each project can be analyzed in terms of its compliance with the goals and development strategy of the agricultural producer, development priorities in the context of regional and national goals, etc. Comparison criteria can also be such indicators of innovative projects as the timing of implementation, significance for the industry and the market, the impact on the level of competition and other factors (Table 2) [13].

Table 2. Selected models for evaluating the effectiveness of investments.

<table>
<thead>
<tr>
<th>Model type</th>
<th>Features and types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point</td>
<td>Qualitative input data, result in the form of irrational numbers</td>
</tr>
<tr>
<td></td>
<td>Bellinger's Model a method for calculating the overall result: summing and multiplication, list method, checklists, scorecard method</td>
</tr>
<tr>
<td>Decision theory</td>
<td>Based on statistics and probability calculation: decision tree, Monte Carlo method</td>
</tr>
<tr>
<td>Limited optimization</td>
<td>Linear and dynamic programming algorithms</td>
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</table>
As it is known, there are no generally accepted assessment methods in agribusiness yet. The expert and scoring method for evaluating innovative projects is the main one in selecting projects for financing, including that within the framework of state programs [14]. To ensure the possibility of selecting innovative developments that, when implemented, can solve the tasks to the greatest extent, it is necessary to improve the existing methods for their evaluation. The simplest and fastest way to improve the applied expert and scoring method for evaluating innovative projects will be to update the criteria in accordance with current national goals and the global agenda.

Previously, three groups of criteria have been formulated for comparing heterogeneous projects, which are reflected in the methods for selecting innovative projects of a number of government programs in the interests of agribusiness.

The first group included criteria for innovativeness, such as a level of innovativeness of the solutions proposed in the project; scale as the total level of capacities to be created as a result of the project; competitiveness and innovativeness of the project; project replicability.

The second group included economic indicators widely used in the evaluation of investment projects, such as NPV, budgetary efficiency of the use of allocated funds and payback period.

The third group included the criteria of social efficiency and experience of the innovator, e.g. the number of jobs created, the impact of the project on the ecology of the region, the presence of a positive reputation, as well as any experience in production and implementation activities [15].

Currently, the global agenda in the field of sustainable development is becoming increasingly relevant, which in the short term can become a determining condition for ensuring the high competitiveness of agricultural production. Therefore, it is proposed to include the following in the third group of the criteria described above: if an innovative project takes into account the goals of sustainable development or whether the innovator has a strategy for sustainable development; the presence of measures to reduce the carbon footprint and the availability of ESG reporting.

Updating the selection criteria for the scoring and expert method by including the listed criteria will contribute to the implementation of the conditions for enhancing innovation, as well as stimulating agricultural enterprises to develop towards sustainable development, which will increase their competitiveness.
4 Conclusion

Agribusiness is tasked with creating conditions for the development of scientific and technical activities, the creation of technologies and the introduction of innovations that will ensure the high-performance, efficient and resource-saving production of competitive agribusiness products. The main area for achieving this is the introduction of innovations. The choice of the most effective innovations is possible using the scoring and expert method for evaluating innovative projects, which is actively used in the selection of projects for financing. However, the criteria used do not meet the strategic goals and the global agenda, therefore need to be corrected.

The use in the evaluation of such criteria as taking into account sustainable development goals by an innovative project or whether the innovator has a strategy for sustainable development, the presence of measures to reduce the carbon footprint, as well as the availability of ESG reporting will harmonize the vector of innovative projects with the global agenda. In addition, in the short term, taking into account these criteria can become a competitive advantage in the global market.

Improvement of the method for evaluating innovative projects from the standpoint of determining relevant evaluation criteria and its subsequent application will contribute to the implementation of conditions for the development of scientific, scientific and technical activities; obtaining the results necessary to create technologies, which will ensure independence and competitiveness.

References

1. V.I. Nechaev et al., Features of the implementation of strategic areas of innovative development of the agrarian sector of the Russian economy in modern geopolitical conditions. Agricultural Economics of Russia, 1, 24-34 (2023)
4. T.E. Marinchenko, Improving the infrastructure for the transfer of innovations in the agribusiness, E3S Web of Conferences, 371, 03001 (2023)
5. V.N. Kuzmin et al., Mechanism for increasing innovative activity in agriculture in Russia using programming. IOP Conference Series: Earth and Environmental Science. Mechanization, engineering, technology, innovation and digital technologies in agriculture 3, 032055 (2021)
6. I.S. Sandu et al., Prerequisites for improving investment in innovation in agriculture: issues of theory and practice. Economics of agriculture in Russia 12, 2-7 (2020)
7. 2023 Indicators of innovation activity. Statistical compendium (NRU HSE, Moscow, 2023)
Conference FarEastCon (ISCFEC 2020). Advances in Economics, Business and Management Research (Vladivostok, 2020)


13. T.V. Yarovova, E.T. Plevako, Methodological approaches to assessing the effectiveness of innovative projects. Natural Humanitarian Research 44(6), 341-344 (2022)

14. I.S. Sandu et al., Prerequisites for improving investment in innovative activities in agriculture: issues of theory and practice. Agricultural Economics of Russia 12, 2-7 (2020)