

Artículo de investigación

# Strategic management of innovative agro-industrial projects

Gestión estratégica de proyectos agroindustriales innovadores  
Gestão estratégica de projetos agro-industriais inovadores

Recibido: 20 de abril de 2018. Aceptado: 10 de mayo de 2018

Written by:

Valerii S. Misakov<sup>8</sup>

Visit A. Khamzatov<sup>9</sup>

Anzhela Kh. Temroкова<sup>10</sup>

Anzor V. Misakov<sup>11</sup>

Irina A. Dikareva<sup>12</sup>

## Abstract

This paper deals with the problems of formation of a strategic management system for innovative agro-industrial projects as one of the priority directions for the restoration and sustainable development of regional economic complexes of the depressed republics of the North Caucasus. This is not accidental, because one of the most effective management methods can be the project management of innovative agro-industrial enterprises, which we believe will enable to increase the volume of food products for the population of the country, and to load agro-processing enterprises with agricultural raw materials.

**Keywords:** crisis, strategic management, agro-industrial complex, diversified agro-industrial structures, depressive territories, innovative design, robotics.

## Resumen

Este documento aborda los problemas de la formación de un sistema de gestión estratégica para proyectos agroindustriales innovadores como una de las direcciones prioritarias para la restauración y el desarrollo sostenible de los complejos económicos regionales de las deprimidas repúblicas del Cáucaso Norte. Esto no es accidental, porque uno de los métodos de gestión más efectivos puede ser la gestión de proyectos de empresas agroindustriales innovadoras, que creemos que permitirán aumentar el volumen de productos alimenticios para la población del país y cargar el procesamiento agrícola. empresas con materias primas agrícolas.

**Palabras claves:** crisis, gestión estratégica, complejo agroindustrial, estructuras agroindustriales diversificadas, territorios depresivos, diseño innovador, robótica.

## Resumo

Este documento aborda os problemas da formação de um sistema de gestão estratégica de projetos agroindustriais inovadores como uma das direções prioritárias para a restauração e o desenvolvimento sustentável dos complexos econômicos regionais das repúblicas deprimidas do norte do Cáucaso. Isso não é acidental, porque um dos métodos de gestão mais eficazes pode ser o gerenciamento de projetos de empresas agroindustriais inovadoras, que acreditamos que permitirão aumentar o volume de produtos

<sup>8</sup> Doctor of Economics, Professor of Tembotov Institute of Ecology of Mountain Territories of Russian Academy of Sciences

<sup>9</sup> PhD (Economics), Associate Professor of the Department of Accounting, Analysis and Audit of the Institute of Economics and Finance of the Federal State Budgetary Educational Institution "Chechen State University"

<sup>10</sup> PhD (Economics), Associate Professor of the Department of Accounting, Analysis and Audit, Federal State Budgetary Educational Institution "V.M. Kokov Kabardino-Balkarian State Agrarian University"

<sup>11</sup> PhD (Economics), Senior Researcher of the Department of "Economics of Innovation Process" of the Institute of Informatics and Problems of Regional Administration, Federal State Budgetary Educational Institution of the Federal Research Center "Kabardin-Balkarian Scientific Center of the Russian Academy of Sciences"

<sup>12</sup> Senior lecturer of the department "Money circulation and credit", Federal State Budgetary Educational Institution "I.T. Trubilina Kuban State Agrarian University»

alimentos para a população do país e sobrecarregar o processamento agrícola. empresas com matérias-primas agrícolas.

**Palavras-chave:** crise, gestão estratégica, complexo agroindustrial, estruturas agroindustriais diversificadas, territórios depressivos, design inovador, robótica.

## Introduction

Recent world economic upheavals, burdened with the US and Western power sanctions, have already exacerbated the problems of improving the quality and standard of living of the population, especially the depressed territories of the Russian Federation. Many regions lack modern technologies for organizing agriculture, which requires the development of an effective mechanism for the introduction of innovative equipment, including agricultural robotics, which allows not only saving material, labor, economic and other resources, but also increasing the creative component of labor in the countryside and thereby, making the industry attractive, and what is very important, consolidating young staff in the countryside. It is especially important in the remote mountainous territories of the republics of the North Caucasus.

## Methodology of the research

The subject of the research is the problems of ensuring sustainable and balanced development of regional agribusinesses on the basis of creating innovative-oriented integrated projects. Various methods of economic research have been applied, such as comparative and logical analysis, functional and systemic approach and correlation-regression analysis.

## Results

The modern agro-industrial complex is not just a simple territorial economic complex, but an integrated socio-economic system. Here it should be noted that the integration level of the agro-industrial complex in the Soviet agrarian economy was quite high, although the state authorities were the subject of the function of integration and coordination.

The formation of market relations has caused a multiple disproportion, enhanced the process of disintegration between the various agro-industrial regions, between the functional spheres of the regional agribusiness, and between financial and production trade and other structures that form and ensure the integrity and unity of the process of agro-

industrial reproduction (Bekova et al, 2011; Gauzhaev et al, 2013). Today the need for innovative projects is obvious when implementing the function of purposeful restoration and sustainable development of integration processes both within the regional agro-industrial complex and the development of integral links in the format of the national agro-industrial complex. It is no coincidence that the program of the Strategy of innovative development of the agrarian and industrial complex of the Russian Federation by 2020 specifies, as one of the key risks, an increase in the inter-sectoral competition for factors determining the competitiveness of innovative systems of the agro-industrial complex, including through investments that attract new knowledge and competence (Decree of the Government of the Russian Federation, 2011). One of the ways of addressing such problems is the robotization of agriculture (Bondareva, 2016; Mishurov, 2010). Today's realities are such that all activities involving robotics in the organization of the agricultural sector are in their infancy and depend on multiple factors. These factors can be systematized as external factors (the level of development of the domestic market for agricultural machinery, prices for agricultural machinery, as well as the reality of state support for the purchase of agricultural machinery), and internal factors (the financial strength of the agribusiness entities, the availability of personnel capable of mastering and servicing robotics, etc. Of course, today, amid acute shortage of financial resources, lack of qualified personnel able to operate and service agricultural robotics, lack of any infrastructure in the regions that ensure the introduction and use of robotics, an extremely low state financial support, etc., are a serious obstacle to the introduction and development of robotics for the organization of agriculture. The need for the introduction of robotics in agriculture is indisputable. As a rule, the level of heavy manual labor, dangerous in many respects, (especially when working with chemicals, pesticides, etc.) is still very high in the industry. Also, one cannot ignore the fact that robotics is not accompanied by subjective factors. Moreover, the role of the human factor is

reduced, which makes it possible to minimize workers' mistakes. The paper shows that the use of milking robotics not only improves the quality of milk produced, but also allows preserving the health of highly productive livestock (Abramova, 2015).

It is no secret that manual labor has always been not only difficult and physically exhausting, but also mundane, giving no way for creativeness. In these conditions, the advantages of robotics, which enable us to find fundamentally new technical solutions, make it possible to liberate a person from monotonous, physically heavy and intellectually insensitive operations. Moreover, the use of robotics at Finnish agricultural enterprises (Pellon 2W) in the distribution of mixed fodders, in our opinion, has made it possible to make the agricultural sector itself attractive for young people. This technical tool allows managing the process of feeding the herd with a large number of livestock, which is very convenient and informative, moreover, the animals are fed automatically, taking into account the developed recipe and the initial components of feeding (Skvortsov, 2015).

There are another examples of robotics. For instance, according to the International Federation of Robotics, in 2020, the volume of the robotics market taking into account the software and the cost of their operation in the world will reach at least \$ 120 billion, despite the fact that only a few years ago (2013) sales volumes of agricultural robots in the US were less than one billion dollars. The United States have the National Robotic Initiative (NRI) operating since 2011. It pursues the goal of increasing the effectiveness of financing of robotics and covers government departments interested in its development. In accordance with this initiative, additional funds have been created and allocated and conditions for financing basic and applied research in the field of robotics, including agricultural ones, have been determined.

An undisputed leader in robotics is Japan, including medical and processing robotics, especially in the automotive industry, where humanoid robotics has been created.

We should also note a recently intensified work on the creation of robotics in the European countries (DeLaval (Sweden), Fullwood (Great Britain), Insentec (Holland), Lely (Holland) - specializes in milking machines, GEA

FarmTechnologies (Germany). Robotics, as a rule, is used in plant growing and animal husbandry, especially in the milking process. According to (Industrial and service robotics in Europe, 2011), the share of agricultural robotics from the entire market of European robotics accounts for almost 40%.

Although Europe leads the production and use of agricultural robotics, it should be noted that even in Western European countries there are still some difficulties in the field of development of agrarian robotics, in particular, because of the incompleteness of the legislative base, the lack of standards for the human-machine interface, etc. Despite their variety, agricultural robotics combines the goal orientation, which is expressed in more economic use of resources in comparison with traditional ones, which have already become classical technologies, in the reduced environmental impact through spot processing, for example, crops, reduced labor protection costs, safety equipment and the like, and improves the quality of control (Bondareva, 2016; Vasianin, 1984; Iurevich, 2011).

The People's Republic of China focuses on industrial robotics...

In the Russian Federation, many institutions of the Russian Academy of Sciences study foreign experience in the development of robotics, develop programs to attract leading scientists to evolve domestic agricultural robotics. In particular, the Institute of Informatics and Problems of Regional Administration of the KBSC RAS has been working on an automated cucumber picker and a sugar beet harvester, studied social and economic reasons for the introduction of robotics into the agricultural sector.

In the course of the study, we found that the subjects of management of activities related to the introduction of office equipment in the regions of the Russian Federation could be: the management bodies of agro-industrial production; executive bodies and branch unions; and regional executive authorities.

The features of managing innovative projects in the regional agro-industrial complex are also caused by the specifics of the formation of market relations in the agrarian sector of the national economy, the objective conditions and market opportunities to adequately react and

regulate the processes of agro-industrial reproduction.

Innovative projects for agricultural enterprises consist of a number of subprojects, such as technological, marketing, organizational, etc. In the course of developing a technological subproject, innovative technologies are being explored (for example, for growing cattle, growing vegetables under cover, etc.).

The marketing subproject includes promotion of the project and its products using a marketing tool...

The organizational project envisages, among other things, the formation of a consultative and analytical center in regional agribusiness, aimed at implementing the strategy of sustainable development of economic entities of the agro-industrial complex...

The domestic experience in the formation of market relations has unambiguously demonstrated that the market is unable to create a mechanism for prompt self-regulation of the processes of agro-industrial production, although other complexes of the domestic economy show the reliability of the current self-regulation of reproduction. This can be explained by the fact that there is a sufficiently high level of elasticity between the dynamics of consumer income and the demand for goods, products; between the dynamics of prices and the demand for goods. Naturally, as the incomes of the population grow, as a rule, the demand for goods increases, after which it is possible that prices for them decrease. In the agrarian sector, as a rule, there is always a considerable level of elasticity between the price dynamics and the supply of agricultural products, moreover, in the case of price elasticity, the self-regulation function of proportionality is provided directly by the market (Turova, 2014; Misakov et al, 2016).

Undoubtedly, the key element of market self-regulation of any production is competition. In our case, we consider the agro-industrial market as a market of perfect competition, because it has many sellers and buyers of various agricultural products. At the same time, one must not ignore the fact that agricultural producers strictly depend on the monopoly structures of the first and third spheres of the agro-industrial complex, which produce means of production for agriculture.

Let us turn to the recent time when the trendsetter in the agrarian sector was the monopoly structure "Rosagrosnab". This association, although it declared a large-scale implementation of leasing of agricultural machinery, in fact was limited only to the sale of equipment in bonded loans, setting its terms and forms of business transactions, usually ignoring the requests of customers. This continued until almost 2000. Such an approach compromised the federal idea of creating and popularizing effective trade and purchasing corporations, moreover, the colossal amounts allocated to this structure from the state budget for the fundamental support of the agrarians went down the drain... (Shevlov et al, 2011; Shevlov & Misakov, 2014).

It should be noted that to this day, rural commodity producers, as a rule, at best, sell their products through monopolists of second-hand dealers, through an incomprehensible layer of agrarian intermediaries ... The result of such procedures is that the share of agricultural producers in the retail price of the final agricultural and processed products does not exceed 25-30% against 60% in the pre-reform period.

Many researchers note that the various mechanisms for managing agriculture and the agro-industrial complex as a whole in the Russian Federation are still ineffective. This is aggravated by the fact that the agrarian sector of the national economy continues to remain one of the most risky spheres of reproduction and entrepreneurship. All this, of course, requires adequate implementation of innovative projects. At the same time, one must proceed from the fact that the first sphere of the regional agribusiness, although it produces the means of production for the industry, these are only a small part of the needs of agriculture, as a result of which their production becomes an external environment for the agro-industrial complex. Moreover, this environment is still unable to provide all the needs of the second and third spheres of the AIC with the necessary means of production, let alone their range and quality. In part, this depends on the catastrophic drop in production itself, as well as in the lowering of effective demand in all structures of agro-industrial production. Naturally, in this context, this sector of the external environment is still extremely unfavorable. One of the effective ways out of this situation is the production of new

products and planning of a significant increment in the efficiency of the means of production used. Our research shows that in the current situation, a qualitative and new resource for the development of productive forces, increasing the social and economic efficiency of the agro-industrial complex is, first of all, small and medium-sized businesses. These structures, with sufficient state support and the formation of the necessary conditions in municipal formations, are able to adapt quickly to the external environment in the face of increasing competition. Only this approach makes it possible to expand the range of goods, services, etc. produced by them, and to involve new technologies in the production and processing of agricultural products.

At the same time, it should be noted that tax incentives are still limited in small and medium-sized enterprises. For example, one of the production structures of the regional agro-industrial complex - the construction sub-complex, which is the key in the construction of new facilities and infrastructure, have the following tax burden on wages:

- 22% - insurance contributions to the Pension Fund of Russia;
- 5.1% - health insurance contributions;
- 2.9% - social insurance contributions;
- 1% and more - deductions for accidents and injuries;
- 13% - individual income tax on income.

In addition, there is a deduction from profit - 20%, 3% of which is for the federal budget, and 17% - for the regional budget of the constituent entity of the Russian Federation.

The property tax is paid separately - 2.2%. Transportation, all mechanisms and land plots are also subject to compulsory insurance.

Membership fee to the SRO fund is 1.5 million rubles.

Small agro-industrial construction enterprises must conduct the certification of workplaces (the so-called special assessment costing 2000-3000 rubles per person per year), compulsory annual education for the purpose of improving the skills of construction professions and environmental costs, etc. Only such environmental taxes the studied construction company A-215 paid in 2017 had reached 150,000.

Moreover, upon signing and executing the contract, the bank, acting as an intermediary

(even if the company does not take a loan), in accordance with the federal law, freezes 10% of the volume of construction and construction work as a guarantor of the completion of the construction cycle. The bank returns this money only after the delivery of the object to the customer, which also puts the construction company at a disadvantage, because it bears production costs and at the same time is forced to seek additional funds for this.

The analysis shows that a large part of small and medium-sized agro-industrial enterprises can be competitive only with their specific support from the state.

In these conditions, the problem of increasing the efficiency of innovative development of the agro-industrial complex aggravates, which, in particular, depends on the forms of management. Moreover, the process of formation and development of diverse equitable forms of management, as well as the development of a multistructured economy, must now be viewed as the basic direction of innovative transformations in the Russian agribusiness sector. Naturally, the distinctive feature of this development is the monopoly of land as an object of management.

It should be noted that there is a chronic underestimation of the field of innovation at the local level, which amid Russian conditions results in the lack of demand for scientific developments, relative stagnation and even loss of the authority of agrarian science itself, slowing the development, and in some places even regression of the scientific and technical progress in agriculture. It is naturally for these conditions that careful organization of the introduction of scientific achievements into agro-industrial production is one of the priority directions in the development of innovative production processes in the face of increasing competition/

The block of scientific organizations that are part of the first sphere of the agro-industrial complex includes many functions of research support for the regional agro-industrial complex, including problems of mechanization, electrification, and automation of production; testing of new equipment; designing of objects of agrarian and industrial complex and agricultural construction; maintenance and repair of agricultural machinery and equipment; use of the newest materials and non-traditional process means of agroproduction, and also activation of research

of fundamental problems of microbiology and biotechnology in agro-industrial production.

The block of scientific institutions of the second sphere of the agro-industrial complex includes problems of the central link of the agro-industrial complex, as a result of which it appears to be a more complex and detailed structure, both in functional and industrial aspects, as well as in providing each functional area with the scientific potential. So, for example, only a section of economic and management problems includes about 30 scientific research institutes, and the functions of the direct technology of agricultural production are provided by the potential of about 250 institutes of various profiles and different levels. In more detailed form, the functional section of the complex of scientific support of the branches of the second sphere of the agro-industrial complex in the corresponding directions are as follows:

- plant growing - more than 120 scientific research institutes,
- husbandry - about 70 scientific research institutes,
- general agriculture - about 30 scientific research institutes, etc.

The block of scientific research institutes of the third and subsequent spheres of the agro-industrial complex covers the problems of processing and storage of agricultural products. It should be noted that in recent years, scientific and technical support for the agro-industrial complex has been formed and built on the basis of a combination of direct budgetary financing and economic incentives for a variety of scientific, design, engineering and implementation teams, information and patent-licensing services, training and professional development systems, credit and financial institutions and material and technical supply units included in this system.

We have to state that the scientific and innovative sphere of the agro-industrial complex has still not been able to restructure due to a number of organizational difficulties. The process of formation of the market of scientific and technical products in relation to the agricultural sector should be based on the principles of fair competition, which will allow to form a balanced supply and demand for these products. Agricultural producers are interested in acquiring and introducing innovations, which will contribute to the improvement of technology, increase in production, its cheapening, and

increase in labor efficiency. All this puts before the developers of technological innovations for the agricultural market the task to produce such developments with the expectation of high efficiency, not only for farmers, but for themselves. Of course, the above does not completely cover the concept of "innovative activity", because the latter covers not only science and agricultural producers, but also all management structures of the agro-industrial complex, up to the Russian Ministry of Agriculture.

We proceed from the fact that the innovative activity of agricultural producers, first of all, depends on their competence level. Indeed, it is one thing when you communicate with the head of the company, who knows modern computer technology, which contains the latest technical, process and economic information, and a quite another matter is dealing with an ordinary manager. That is why modern information support of agricultural producers with the appropriate information formations is the most important direction for increasing innovative activity in the agricultural sector.

In the course of the study of the regional agribusinesses of the North Caucasian republics, we have convinced that the implementation activity is still not an important part of the overall scientific and technical activity. In agriculture, as in any branch of the national economy, the generally accepted classical "science-production" scheme has an unfinished form and, naturally, does not correspond to modern relations between producers and consumers of innovative products.

The main principle of effective cooperation between the innovator and the agricultural enterprise as consumers of innovative products is their mutual interest and responsibility, which is built on economic calculation. So, for example, Agropus LLC receives from innovator enterprises highly effective technologies for growing vegetables under cover, introduces them in its farms, trains its staff, etc.

Another most effective tools for increasing the innovative activity and interest of agricultural producers is the creation of consulting and analytical centers in the republics. Today, special market structures are already popular, occupying an intermediate link between its producers and consumers, such as stock exchanges of scientific

and technical products, data banks on completed research, intellectual labor exchanges, etc.

Such structures help neutralize the crisis in agriculture, form its competitive advantages, etc., which ultimately improves the country's food supply, the welfare of the population...

The next aspect of the innovative and process development of the agro-industrial complex is the natural and climatic features and the specificity of technology and the organization of agro-industrial production arising therefrom in the republics of the North Caucasus Federal District. The point is that the introduction of innovative projects will contribute to the year-round production of agricultural products, etc. by minimizing dependence on natural and climatic factors.

### Summary

We may conclude that the regional agribusinesses of the depressed republics of the North Caucasus desperately need organizational and methodical improvement of the strategic management system, which is actualized by increasing demands on the volume and nature of the work carried out by agricultural enterprises, as well as the need to neutralize the shortcomings and omissions in its organization caused by subjective factor - insignificant professionalism in the innovation activity of the majority of agrarian specialists.

At the same time, the level of final results and the prospects for a balanced development of the regional agribusiness and its constituent diversified enterprises and organizations are mainly determined by the extent to which their organizational management structures are adequate to the needs of the market, designed to guarantee a specific level of profit by ensuring a balance between strategy and operational activities.

Today, achieving high results in the agrarian sector of the Russian Federation is possible only if start implementing innovative projects. In these conditions it is difficult to overestimate the importance of methodologically correct choice of the criterion of effectiveness of agro-industrial organizations, focused on project management. Under enhancing competition, it is obvious that innovative development and innovative management are becoming key factors in the growth of efficiency and quality of agricultural

products. In addition, lack of these factors makes impossible to restore, and then move to a balanced sustainable development of depressed agrarian-oriented republics of the North Caucasus.

### References

- Abramova N.I. (2015). Influence of various technologies of milk production on milk productivity of cows and the content of somatic cells // *Molochnokhoziaistvennyi vestnik*, No. 4. - Pp. 7-11
- Bekova O.O., Ozdoeva D.M., Misakov V.S. (2011). Integration as the basis for the formation of a regional production complex. *Economic sciences*, No. 85. Pp. 163-167.
- Bondareva N.N. (2016). The state and prospects for the development of robotics: globally and in Russia // *MID (Modernization, Innovation, Development)*, V. 7. - No. 3 (27). - Pp. 49-57.
- Decree of the Government of the Russian Federation No. 2227-r of December 8, 2011 "On the Strategy for Innovative Development of the Russian Federation by 2020" [Electronic resource]. URL: <http://www.garant.ru/products/ipo/prime/doc/70006124/>.
- Gauzhaev A.Z., Mairov A.I., Misakov V.S. (2013). Institutional and organizational context of the modernization strategy for the development of regional production complexes. *Terra Economicus*, V. 11. No. 2-2. Pp. 62-66.
- Industrial and service robotics in Europe - August 2011// [Electronic resource]. URL: <http://fr.slideshare.net/bizresonance/robotiqueindustrielle-et-de-service-europe-aout-2011-8839337>
- Iurevich E.I. (2011). *Fundamentals of Robotics / BHV-Petersburg*, 2011. - p. 270.
- Misakov V.S., Kuyantsev A.I., Dikinov A.H., Kazancheva H.K., Misakov A.V. (2016). National agriculture modernization on the basis of import substitution. *International Business Management*. 2016. V. 10. No. 10. Pp. 1946-1951
- Mishurov N.P. (2010). Modern robots in agriculture // *Engineering and equipment for the village*, No. 5. - Pp. 46-48
- Shevlov V.Z., Ashibokov B.A., Misakov V.S. (2011). Leasing as a form of investment in the agricultural sector of the economy. *Economic sciences*, No. 85. Pp. 182-185.
- Shevlov V.Z., Misakov V.S. (2014). Guidelines for improving the investment and business climate in the CBD. *News of Kabardino-*

Balkarian Science Center of the Russian Academy of Sciences, No. 2 (58). Pp. 110-113.  
Skvortsov E.A. (2015). Agricultural robots in the system of reproductive processes // Agrarian Bulletin of the Urals, No. 3. - Pp. 89-94  
Tsurova L.A. (2014). Points of growth of social and economic development of the Republic of

Ingushetia. Bulletin of Kostan Levanovich Khetagurov North Ossetian State University, No. 3. Pp. 418-423.  
Vasianin V.I. (1984). Agricultural robots - Moscow: Kolos, p. 224.