Current Approaches to Intensified Investments Needed in Agribusiness

I Volkov¹, S Suslov¹, N Zavivayev¹, R Bazhenov², O Dolmatova³

¹Nizhny Novgorod State of engineering-economic university, Knyaginino, Russia
²Sholom-Aleichem Primursky State University, Birobidzhan, Russia
³Omsk State Agrarian University named after P.A. Stolypin, Omsk, Russia

E-mail: igor.igor-v1964@mail.ru, nccmail4@mail.ru, zavivaev_nik@bk.ru, bazhenov@yandex.ru, on.dolmatova@omgau.org

Abstract. The current state of the agricultural sector largely depends on various factors affecting the efficiency of production activities and improving the quality of products. A significant part of Russian farmers lag behind foreign agricultural producers both in terms of automation and mechanization of their production, and in terms of productivity of farm animals and grain crops. This result is explained by the low level of innovation in agricultural production, due to the low financial performance of their activities. Based on these facts, the purpose of the study was to form modern approaches to the activation of innovative processes in the agro-industrial complex of Russia. On the basis of official statistical data, the results of scientific research, data from leading publications on the subject under study, the paper used statistical and economic, monographic and computational and constructive method of scientific research. As a result of the research, the methodology for assessing budgetary efficiency has been improved. The necessity of creating a system of availability of new information on existing innovations to each agricultural producer regardless of the size and form of ownership is revealed. Initially, it can be presented in the form of public Advisory services operating in each municipal district. The constructive recommendations allowing developing the agrarian sphere more effectively taking into account special features of the Russian economy are presented.

1. Introduction
Agriculture has always been, and will be, an important sector for the economy of any country, as it forms the food supply of the population with food.

A more complex economic category – food security-already depends on the level of agricultural development. Food security includes a number of scientific problems related to issues such as food independence, quality and environmental friendliness of food (food safety), economic access to food, physical access to food, products and others.

That is, the agricultural products produced and the food products derived from it should be of environmentally high quality, that is, do not harm the health of the consumer. Should be available both in kind, that is, be in retail outlets, and economically available, so that the consumer does not infringe on other benefits when buying food.

Ensuring food security is one of the main objectives of the agricultural and economic policy of all states, as it is the basis of their national security. For the first time the issue of food security at the...
international level was raised in December 1974, which was preceded by the grain crisis of 1972-1973. The UN General Assembly then approved the “International obligations to ensure food security in the world” developed on the basis of the recommendations of FAO (food and agriculture organization of the UN).

A lot of scientific research on the problem of food security was conducted by A. Altukhov, who investigated not only the principles of its formation, but also dealt with the issues of interstate integration in the agro-industrial complex (AIC) [1] and the introduction of information technologies for the rational organization of agriculture [2].

Among the foreign scientists involved in this problem can be identified a group of British scientists led by H. C. J. Godfrey et al. [3] and D. B. Lobell et al. [4] evaluated the global conditions and trends in agriculture and food security, which allowed to establish a benchmark for world discussions on this topic.

Questions of economic efficiency of production of potatoes and food supply of the population were engaged in by N. A. Smirnov [5], N. Amara et al. [6] and others.

These scientific categories, but in the grain industry studied I. G. Generalov et al. [7], S. Yao and Z. Liu [8], A. E. Shamin et al. [9]. Grain production is traditionally the basis of the entire food complex and the largest sector of agriculture, the development of which largely depends on the provision of food, its standard of living.

Summing up the studied works of modern scientists, we can state one thing, that all the studies affect the problems of innovation in the agricultural sector.

The development of agricultural production largely depends on the level of development of innovative processes related to the organization of supply, production and marketing of products. At the same time, the innovative development of the organization should be of a continuous systemic nature, taking into account both the improvement of the production indicators of its own organization and the social sphere of society (within the framework of strategic programs for the development of corporate social responsibility of the municipality where the organization is located). Of course, the Genesis of innovation processes is inextricably linked with the investment policy of the organization, taking into account its own potential, as well as measures of state support.

The purpose of this study is to develop modern approaches to the activation of innovative processes in the agro-industrial complex on the basis of theoretical and practical research.

2. Materials and methods
To achieve the goal of the study, it is necessary to solve the following tasks: to analyze the current state of financing of agriculture in the Russian Federation; to identify the share of unprofitable agricultural organizations; to study the role of consulting services in the dissemination of innovations; to determine the main trends in research on this issue; to identify the evaluation of indicators of efficiency of budgetary funds; to propose measures for the development of innovative activity in the field.

The information base of the research was scientific publications in Russian and foreign publications, official statistical data of the Federal state service of the Russian Federation, practical experience of typical agricultural organizations.

The paper used statistical and economic as a representation of the summary statistical results of the financial activities of agricultural organizations; monographic method – in identifying emerging trends in the development of innovation and design in the formation of the project to create consulting services on the basis of the study, their own experience and achievements of science.

3. Results and discussion
Studying the consolidated budget of the Russian Federation and the budgets of state extra-budgetary funds in 2016 revealed that the funds allocated for the development of agriculture and fisheries amounted to 331.7 billion rubles or 0.4 % of the country's GDP (table 1).
According to the data given in table 1, we can state the imbalance between the funds allocated for the development of agriculture and fisheries, and expenditure on social activities, which amounted to 17946.5 billion rubles or 20.9 % of GDP (table 1).

Innovative development largely depends on the support of applied research, but in 2016 these funds were insignificant and amounted to 251.7 billion rubles, which was 0.3 % of GDP (table 1).

Despite the fact that in Russia since 2000 the volume of research and development costs has been continuously growing (Fig. 1) and in 2015 reached the value of 914.5 billion rubles (which was 40.5 billion dollars), but this figure in comparison with developed countries is low.

In the US, the funds allocated for development in the year amounted to 457 billion dollars, China – $ 368.7 billion, Japan – $ 166.9 billion, Germany $ 108.8 billion. In terms of the share of expenditure on science in GDP, Russia lags far behind the leading countries of the world, ranking 34th. The five leaders are the Republic of Korea (4.29%), Israel (4.11%), Japan (3.59%), Finland (3.17%) and Sweden (3.16%).

Table 1. Consolidated budget of the Russian Federation and budgets of state extra-budgetary funds, 2016. *

| Name                                      | Allocated funds, billion rubles | % to GDP |
|-------------------------------------------|---------------------------------|----------|
| Income – total                            | 28181.5                         | 32.8     |
| Costs – total                             | 31323.7                         | 36.4     |
| on national issues                        | 1849.9                          | 2.1      |
| on national defense                       | 7777.6                          | 4.4      |
| national security and law enforcement     | 2011.4                          | 2.3      |
| On national economy                       | 3889.8                          | 4.5      |
| from it                                   | 65.6                            | 0.1      |
| for fuel and energy complex               | 331.7                           | 0.4      |
| agriculture and fisheries                 | 693.7                           | 0.8      |
| for transport                             | 1366.2                          | 1.6      |
| for road facilities (road funds)          | 97.4                            | 0.1      |
| on communication and Informatics for applied research in the field of national economy | 251.7 | 0.3 |

* compiled on the basis of data of the Federal state statistics service of the Russian Federation [10]

Figure 1. Research and development costs for all sources of financing in Russia, billion rubles. *

* compiled on the basis of data of the Federal state statistics service of the Russian Federation [10]

A significant predominance in the budget of funds for social and cultural activities in comparison with the budget allocated to other sectors of the national economy, including agriculture, applied research is one of the reasons for the innovative backlog in most agricultural organizations in Russia.
It is necessary to radically change the priorities in the budget policy, to orient the state support, especially in scientific developments that have real results in the production activities of organizations.

Since 2000, there has been a steady increase in innovative investments in agricultural production. In 2016, the increase in investments in agriculture, hunting and forestry exceeded this figure in 2000 by more than 17 times, while the increase in total investments was 12.6 times. Of course, this affected the financial condition of agricultural organizations.

**Table 2.** Dynamics of total investment and investment in agriculture, hunting and forestry in Russia, billion rubles. *

| Name                      | 2000 | 2005 | 2010 | 2012 | 2013 | 2014 | 2015 | 2016 |
|---------------------------|------|------|------|------|------|------|------|------|
| Total investments        | 1165 | 3611 | 9152 | 12586| 13450| 13903| 13897| 14640|
| Investment in agriculture, hunting and forestry | 34.8 | 142.3| 303.8| 476.4| 516.6| 510.3| 505.8| 611.2| 576.4|

* compiled on the basis of data of the Federal state statistics service of the Russian Federation [10]

The increase in investments in agriculture in Russia in the period 2000-2016 is correlated with a decrease in unprofitable agricultural organizations. In 2016, their share decreased by 3.9% compared to 2005, but this is less than the deviation of this indicator in the economy as a whole by 13.1%. Despite the decrease in loss-making agricultural organizations, the amount of loss in 2016 amounted to 49.4 billion rubles, which increased by 9.4 billion rubles compared to 2003.

**Table 3.** The share of loss-making organizations (%) and the amount of loss (billion rubles). *

| Name                      | 2003 | 2005  | 2015  | 2016  | Deviation 2016 to 2003 (+, -) |
|---------------------------|------|-------|-------|-------|-------------------------------|
| In economy                | 43   | 359.6 | 36.4  | 447.7 | 32.6  | 5151.1 | 1607.7 | -17   | +1248.1 |
| Agriculture, hunting      | 53.340 | 42.3  | 36.1  | 24.1  | 83.9  | 17.2  | 49.4 | -3.9 | +9.4 |

* compiled on the basis of data of the Federal state statistics service of the Russian Federation [10]

One of the measures to eliminate the unprofitability of agricultural production and improve its efficiency should be an improved state strategy, including a focus on additional tax on profits of organizations receiving budgetary funds for the maintenance and innovative development of agriculture, to conduct research and development related to the introduction of innovations in the sphere of agriculture. At the same time, due to additional taxation, it is necessary to form a network of state consulting services that orient agribusiness to effective activities, and those that have either social significance or allow satisfying the existing demand as much as possible, taking into account the trade turnover in the country.

In recent years, many scientists in their work focus on the need for the formation of a system of Advisory services to the agricultural sector of the economy and especially small agricultural enterprises.

Professor V. M. Koshelev also pointed out the need to create these consulting structures. He argued: “The task of society and the state is to create such tools of agricultural policy that would allow the commodity producer to find optimal solutions in a timely manner for a wide sector of the problems
facing it.... Such a tool should be the consulting (or information and consulting) service (ICS) for rural producers” [11, p. 3].

The main objective of the proposed Advisory services should be the formation of consistency between innovative developments of agricultural business – state support and other financial provision covering all agricultural regions of Russia. In this case, the main objectives should be directed:

- the effective use of state support by reducing the time between the development of innovations and its implementation in existing or newly created agricultural production;
- the orientation of young people to develop their own agribusiness, taking into account advanced technologies and existing consumer needs;
- to provide consulting assistance in determining the preferred type of activity in the purchase of machinery, equipment, seed, planting material, highly productive livestock, etc.
- to control and evaluate the effectiveness of budgetary funds.

In recent years, the state has paid more attention to information and consulting support for rural producers. Recent decisions of the Ministry of agriculture of the Russian Federation focused on the following areas:

- creation of information and communication system of agro-industrial complex of Russia, designed to provide automated data exchange at all levels, as well as effective application of information technologies in the activities of district, district and district bodies of agro-industrial complex;
- creation of an automated information system that combines information support for the activities of the Ministry of agriculture of the Russian Federation, the Rosselkhoz, the Rosselkhoznadzor and the processes of management of the agro food market regulation sector.

The presented directions require the creation of mechanisms for bringing information support to each agricultural producer and the formation of state structures at the regional, municipal level to effectively direct money to the development of agro-business on the basis of scientifically sound solutions adapted to the existing conditions of agricultural production, the interests of society and business.

The organization of consulting services in the Russian agricultural sector has been addressed by many scientists-economists, but it is possible to allocate so researchers like S. A. Shelkovnikov et al. [12] I. S. Sandu et al. [13], V.L.Erokhin et al. [14] which propose the creation of Advisory services on the basis of agricultural clusters for innovation.

Vision B. A. Voronin et al. on the effective use of funds in the development of agriculture is based on the creation of regional centers of regulation and support of rural consumer cooperation in agriculture (SEC) [15]. According to O. D. Rubaeva and S. I. Lilimberg, “The motivation of interaction between the subjects of small forms of management in the agro-industrial complex and cooperative formations with the Price of support for the SEC will be due to access to large information arrays and services in various areas of cooperative activity, high quality of services provided, "transparency" of the activities of this organization.” In their opinion, the purpose of creating regional centers of regulation and support of rural consumer cooperation in agriculture will be non-profit, and the provision of information services, as this structure should be formed as a non-profit organization [16].

Other authors, such as V. Lugovnin proposes the creation of regional branches of the information and consultation center (a subsidiary LLC), which should perform the following functions: to process information about each innovation applied in the specific conditions of agricultural activities, if necessary, its adaptation to these conditions the perception of agricultural producers; to attract the attention of the innovation to potential users by disseminating information about the various information sources; to train target groups of representatives of agricultural production to methods of use of innovation; to render individual consulting services to clients determination of acquisition of necessary materials, the equipment ... for the development of innovations, the implementation of its implementation; organize the activities of rural (settlement) representatives of the ICC [17].
L. Ts. Badmakhalgaev and V. V. Zverev, along with the achieved success in the activity of information consulting services, point to some shortcomings that hinder the development of these services and do not allow the system of information consulting of agriculture to fully become an important element of the market economy. The most important of them are as follows: there is no single multi-level information base of normative documents; lack of system of generalization of the advanced production and economic experience and its distribution, not compliance in the majority of consulting services of the existing methods and techniques of monitoring of needs of agricultural producers, insufficiency of staffing of these services in highly qualified specialists, complex methods of an assessment of efficiency of functioning of ICS and their subjects are not fully developed; the lack of funding from the Federal, regional and local budgets, which makes it difficult to provide services with the necessary material and technical base and does not allow to hire highly qualified specialists, the imperfection of the mechanism for the provision of paid consulting services, in particular, there are no price lists for information and consulting services. In many ways, these problems are connected with the fact that the trends in the development of the agricultural consulting system are insufficiently investigated, which is why there are extremely contradictory views and approaches to the organization of the agricultural consulting system and the fundamental directions of its development [18].

These shortcomings of the authors, in terms of assessing the effectiveness of the ICS in Russia, are primarily due to the lack of the ICS assessment algorithm, taking into account the actual effect of budgetary funds (investment and local nature) and the assessment of changes in the economic and social condition of the organization (the recipient of state support).

An important role in the formation of the system of state support for agribusiness is monitoring the effectiveness of budget investments in the context of organizations – recipients of budgetary funds and assessing the compliance of their actual results with the effect that is expected from the submitted state measures.

Evaluation of the effectiveness of the use of budgetary funds should be ensured through the use of quantitative and qualitative indicators, dynamic indicators and indicators (growth and decline over a certain period of time), characterizing the observance of the legality of the use of funds (misuse of budgetary funds, causing damage due to violations of budget legislation).

At the same time, the final assessment of the achievement of strategic goals and objectives by the Executive authority of the subject of the Russian Federation on the implementation of budgetary funds should be formed as the sum of the products of the assessments of the achievement of goals multiplied by the corresponding weights. This method makes it possible to justify measures aimed at optimizing the budget sector; expanding the scope of application of program-target methods of budget planning; allocation of allocations between the main managers, managers and recipients of funds, taking into account the results of their activities; improvement of the public procurement system.

The order of the Ministry of regional development of the Russian Federation No. 493 of October 30, 2009 approved the method of calculation of indicators and application of criteria of efficiency of the regional investment projects applying for receiving the state support at the expense of budgetary appropriations of Investment Fund of the Russian Federation. This technique was focused on assessing the effectiveness of budgetary funds through integrated indicators showing an increase in the profitability of the enterprise as a result of the implementation of projects through the partial or full use of budgetary funds [19].

Within the framework of the presented methodology, R. M. Yusupov proposes to focus on the change of the economic component of the organization receiving budgetary funds in determining the efficiency of budgetary funds [20].

He suggests to consider as an indicator of efficiency of use of budgetary funds – the index of profitability of budgetary funds – \( I_{bc} \) (by analogy with the indicator – the index of profitability of investments calculated at the analysis of efficiency of investment projects). For example, for the first year of operation of the investment (or budget funds planned for the first year of the program)
The criterion of efficiency is the value of the profitability index of budgetary funds greater than 1: 

\[ I_{bc1} = \frac{ChP_1 + A_1}{(1 + r) \cdot TsF_1} \]  \hspace{1cm} (1)

or

\[ I_{bc1} = \frac{NREI_1 - NP_1 + A_1}{(1 + r) \cdot TsF_1} \]  \hspace{1cm} (2)

The criterion of efficiency is the value of the profitability index of budgetary funds greater than 1: \( I_{bc1} > 1 \).

\( ChP_1 \) – net financial result of enterprises in the industry for the first year, net of income tax payments (\( NP \));

\( NREI_1 \) – net operating result of investments for the first year;

\( A_1 \) – the amount of depreciation of all enterprises of the industry involved in the implementation of the program;

\( TsF_1 \) – target financing in the first year - the amount of budget funds allocated in the first year of the program. Similarly, indicator \( I \) of \( I_{bc} \) is calculated for all subsequent years.

The main disadvantages of the presented approach to assessing the effectiveness of budget driving in the development of agricultural production is:

- the complexity of calculations in assessing the budget allocated to a significant number of agricultural organizations;
- the presented estimated indicator (profitability index of budgetary funds) has a direct relationship with the profit of the organization - the recipient of budgetary funds. This, under certain conditions of state support, may affect the amount of income tax. What, ultimately, can put in unequal conditions, of the organization concerned with the evaluation of the efficiency they receive budget funds.
- the indirect nature of the presented indicator does not directly show the impact of budget investments in increasing the collection of budgetary funds.

In existing practice, the budget efficiency is also determined using the index of the budget efficiency (the budget efficiency, fiscal efficiency, fiscal performance index, the relative budgetary effect). This indicator is defined as the ratio of the amount of tax and other mandatory payments to the budget in connection with the implementation of the investment project to the amount of funds provided by state support.

The calculation of this indicator is presented in the formula

\[ I_{be} = \frac{\sum NP_t \cdot K_d}{\sum R_{hunt}} \]  \hspace{1cm} (3)

where \( I_{be} \) – budget efficiency index;

\( NP_t \) – taxes to budget for \( t \) year;

\( R_{hunt} \) – budget funds intended for state support of the investment project in \( t \) year;

\( K_d \) – the discount rate of the investment project.

The project is considered to be effective if it exceeds one (according to the normative legal acts of other subjects of the Russian Federation 1.5).

\[ I_{dbi} = \frac{BE}{R_{hunt}} \cdot K_d \]  \hspace{1cm} (4)

where \( I_{dbi} \) – the profitability index of the investment budget.

\[ BE = (NP_t - R_{hunt}) \cdot K_d \]  \hspace{1cm} (5)

where \( BE \) – budgetary effect from realization of the investment project [21; 22].

For hanging the efficiency of budget funds, perfection of system of an estimation of efficiency of state support proposed in the assessment of the implementation of the budget, to make the evaluation index effectively-STI budget funds in production development. In contrast to the existing index of budget efficiency, this indicator takes into account the increase in taxes as a result of state support.

The proposed index will determine how much will increase the tax on profits from each ruble invested...
in the production of budgetary funds. At the same time, one of the conditions for assessing the effectiveness of the allocated budget funds will be the value of this index not less than 0.05.

The proposed indicator \( I_n \) (6) should be calculated after 1 year of implementation of the innovation project or after 3 years after receiving state support for the current reimbursement of production costs and is an indicator of both the effective use of budgetary funds and the evaluation of the work of the proposed state consulting departments
\[
I_n = \frac{\Delta N}{P} \quad (6)
\]
where \( \Delta N \) – the amount of increase in income tax after the allocation of budgetary funds to the organization.

\( P \) – the amount of state support.

If assessed, government support for an innovation project the proposed index is defined as follows
\[
I_n = \frac{\Delta N \cdot K_d}{P} \quad (7)
\]

Important for the development of rural areas are the living conditions of rural residents: gasification of housing, developed housing and communal services, the availability of social facilities. At the same time, the role of housing and communal services of the old Fund of rural settlements with the appropriate maintenance of existing engineering networks is an important component in the formation of favorable living conditions, and hence the consolidation of labor resources in the village.

The standard of living of the population, its well-being largely depends on the level of housing and communal services.

In the direction of overcoming the socio-economic and cultural differences between the city and the village, the convergence of working and living conditions of urban and rural population, the further strengthening of farming should be given some time.

This period should involve active state participation in the development of the social sphere of rural areas and improving the accounting and evaluation of public social investments.

In assessing the effectiveness of monetary investments in the development of education, health, culture and sports based on the determination of the index of efficiency of social investment \((IESI)\), which is determined by the following expression
\[
IESI = \sum_{i=1}^{n} \frac{K_{sq} \cdot K_{vsi}}{Z} \quad (8)
\]
where \( K_{sq} \) – indicator characterizing the volume of social investment (social service);
\( K_{vsi} \) – service quality index;
\( Z \) – the cost of performing the services by the agency, in the year;
\( n \) – the number of institutions in this area of social investment in the study region.

The disadvantage of the presented indicator is the lack of visibility of changes in social indicators in the period under review, depending on the budget.

To assess the effectiveness of budget investments in the social sphere, we propose to use the following index
\[
I_c = \frac{\Delta Z \cdot 1000}{P} \quad (9)
\]
where \( \Delta Z \) – percentage of improvement of the indicator after allocation of budgetary funds in relation to the existing indicator of the social sphere;

\( P \) – amount of state support;

\( I_c \) – index of efficiency of budget investments in the social sphere.

The index of efficiency of budgetary investments in the social sphere shows what amount of budgetary funds (in 1000 rubles) led to an improvement in the social indicator by 1 %.

A network of public Advisory services is proposed to promote innovation, improve the efficiency of budgetary funds and private investment directed to existing and newly created agricultural
organizations. The developed structure of the service of consulting services of the regional Department of agriculture and environmental management is shown in figure 2.

![Structure of the service of consulting services of the regional Department of agriculture and environmental management.](image)

**Figure 2.** Structure of the service of consulting services of the regional Department of agriculture and environmental management.

To provide the necessary information on the provision of agricultural activities with modern means of production (machines, equipment, tools) and other resources, it is proposed to create a single electronic information environment providing information about the products and services of organizations producing modern products in Russia and developed countries with the possibility of concluding an electronic transaction for the purchase and non-cash payment. The proposed electronic environment should also provide information on the possibilities and conditions of lending to agricultural business, information on the demand and conditions of purchase of agricultural products, etc. Centralization and systematization of this information will reduce the time to find the right solution to the problem when advising existing agribusiness, and when creating again offer the most effective set of measures, taking into account the available funding.

The duties of consultants on innovative development of existing business should include the economic justification of the need for innovative reforms in the framework of state support programs, including joint investment, preferential terms of lending, taxation, etc. Consulting support of innovative projects at the stages of implementation of their life cycles. As part of the additional agreements, it is envisaged providing the organization with information on state programs and modern technologies within the framework of the organization's production activities.

The duties of consultants for the organization of new business include both economic justification of the most promising areas, assistance in the acquisition of modern technologies, equipment, productive livestock, high-yielding seed material and further visit to the enterprise and directly at the workplace training of personnel in new techniques and methods of labor organization. The main objectives of this consultant are:

- assistance in reducing the payback time of state support allocated to newly created organizations of agricultural business and in increasing their effectiveness;
- assistance in the implementation of social programs.

4. Conclusion

The peculiarity of the presented structure is the creation of a unified electronic information environment (UEIE). The proposed UEIE is an electronic base for generalized information about sellers of modern machinery, equipment, organizations that sell highly productive cattle, high-yield seed, planting material, buyers and intermediaries of agricultural goods, credit and loan organizations, leasing companies, etc. To process applications from various departments of the service, it is proposed to centralize this work with the organization of the system administration department for work in the generalized information system.
Regional management of advisory services should also work closely with various forms of agricultural producers' associations (unions, farmers' associations). The task of which on the one hand at the legislative level to promote the necessary amounts of state support and ensure the continuity of agricultural production, on the other hand to provide feedback on the study of agricultural producers and through the state Advisory services at the municipal level to solve these problems.

The organization of the system of consulting support of public investments in the development and maintenance of production activities and social sphere of agricultural organizations, through the formation of public advisory services is an important component of the effective use of budgetary funds as an instrument of state regulation and development of investment processes in agribusiness in Russia.

5. References
[1] Altukhov A, Semin A 2018 Increasing interstate integration in the agro-industrial complex of the EAEU countries European Research Studies Journal 21(2) 753-771
[2] Altukhov A I, Bogoviz A V, Kuznetsov I M 2019 Creation of an information system – a necessary condition of rational organization of agricultural production Advances in Intelligent Systems and Computing 726 800-809
[3] Godfray H C J, Beddington, J R, Crute I R, Haddad L, Lawrence D, Muir J F, Pretty J, Robinson S, Thomas S M, Toulmin C 2010 Food security: the challenge of feeding 9 billion people Science 327 812–818
[4] Lobell D B, Burke M B, Tebaldi C, Mastrandrea M D, Falcon W P, Naylor R L 2008 Prioritizing climate change adaptation needs for food security in 2030 Science 319(5863) 607–610
[5] Smirnov N A, Suslov S A 2014 Potato production and supply in certain territories of Russia in 2003-2012 Journal of the Geographical Institute 'Jovan Cvijic' SASA 64(3) 347-357
[6] Amara N, Traoré N, Landry R, Romain R 1999 Technical efficiency and farmers’ attitudes toward technological innovation: the case of the potato farmers in Quebec Canadian Journal of Agricultural Economics 47 31–43
[7] Generalov I G, Kuchin N N, Suslov S A, Ryabova I V, Kurilova A A 2019 Assessment of regional grain farming development for sustainability International Journal of Advanced Biotechnology and Research 10(1) 223-231
[8] Yao S, Liu Z 1998 Determinants of grain production and technical efficiency in China Journal of agricultural economics 49 171–184
[9] Shamin A E, Zaikin W P, Igoshin A N 2018 Problems of grain harvesting in Russia Bulletin NGIEI 6 130–138
[10] Russia in figures 2017 Rosstat (Moscow)
[11] Koshelev V M 2007 The organization of consulting service in agrarian and industrial complex Colossus (Moscow)
[12] Shelkovanikov S A, Matvienko S N, Vyshegurov M S, Petukhova N V, Fedyaev P M, Semina L A 2017 Boosting the efficiency of agricultural organizations taking into account the state support (a case study of the Novosibirsk region) International Journal of Economic Research 14(16) 419-435
[13] Sandu I S, Veselovsky M Ya, Fedotov A V, Semenova E I, Doshchanova A I 2015 Methodological aspects of social and economic efficiency of the regional activities Journal of Advanced Research in Law and Economics 6(3) 650-659
[14] Erokhin V L, Ivolga A G, Andrei J V, Cvijanović D, Ion R A, Ivolgam I, Jeločnik M, Labenko O, Subić J, Trukhachev A V, Turek R A, Turek R M, Vuković P 2013 Contemporary issues of sustainable rural development: International approaches and experiences of Eastern Europe and Russia (Agrus, Stavropol)
[15] Voronin B A, Chupina I P, Pustuev A L, Semin A N, Potekhin N A, Lysenko Yu V, Rubaeva O D, Bukhtiyarova T I 2017 State procurement mechanism for agricultural products in modern
[16] Rubayeva O D, Lilimberg S I 2016 Development of model of the regional center for regulation and support of rural consumer cooperation Agrarian bulletin of the Urals 1 91-96

[17] Lugovnina V V 2008 To a question of structure of information advice center Bulletin of the Irkutsk state technical university 2 177-180

[18] Badmakhalgayev L Ts, Zverev V V 2012 Development of a system of agricultural consultation in Russia: problems and prospect Bulletin of the Astrakhan state technical university. series: economy 2 76–82

[19] The order of the Ministry of Regional Development of the Russian Federation of 30.10.2009 No. 493 On the statement of the Technique of calculation of indicators and use of criteria of efficiency of the regional investment projects applying for receiving the state support within budgetary appropriations of Investment fund of the Russian Federation http://legalacts.ru/doc/prikaz-minregiona-rf-ot-30102009-n-493

[20] Yusupov R M 2014 The methodology of assessing the efficiency of state regional programs Management of economic systems 4 40

[21] Kolmykova T S 2015 Investment analysis Infra-M (Moscow)

[22] Mezhov I S, Rastova Yu I, Bocharov S N, Mezhov S I 2016 Investment analysis Knorus (Moscow)