JIBC

Journal of Internet Banking and Commerce

An open access Internet journal (http://www.icommercecentral.com)

Journal of Internet Banking and Commerce, December 2016, vol. 21, no. S6

Special Issue: Territory and Industry: The Search for Innovative Ways of Developing

Edited By: Eda Yasa Ozelturkay

INVESTING IN INNOVATION PROJECTS IN RUSSIA'S AGRIFOOD COMPLEX

TATIANA IVANOVNA GULYAYEVA

Parakhin Oryol State Agrarian University, General Rodin St., Oryol, Russia, Tel: +7 (84457) 9-45-67;

Email: **g.mashentseva@bk.ru**

TATIANA MIKHAILOVNA KUZNETSOVA

Parakhin Oryol State Agrarian University, General Rodin St., Oryol, Russia

JULIA VLADIMIROVNA GNEZDOVA

Julia Vladimirovna Gnezdova, Przhevalsky St., Smolensk, Russia

MIKHAIL YAKOVLEVICH VESELOVSKY

University of Technology, Gagarin St., Korolev, 141070, Russia

NABI DALGATOVICH AVARSKII

All-Russia Research and Development Institute of Agricultural Economics, Khoroshevskoe Shosse St., Bldg. 2, Moscow, Russia

Abstract

This paper examines the major aspects of the present-day operation of Russia's agrifood complex, the state of its agricultural markets, the legal and regulatory framework underlying the sector's operation, and the nation's existing interregional trade barriers. The authors bring to light some of the issues related to filling the gaps in the funding of small and medium-sized businesses to ensure boosts in the innovation component and competitiveness of Russia's agro-industrial complex. Small and medium-sized enterprises within the agro-industrial complex naturally have a pronounced regional orientation. There is a need to activate innovation processes in order to help remediate the sub-par technical and technological condition of the nation's agricultural sector and food processing industry, insignificant levels of innovation-related activity at science and research institutions, lack of long-term strategy for adapting to changing client demands, and low competitiveness levels within the agrarian sector. A crucial element of policy respecting small and medium-sized enterprises within the agrifood complex is government support for programs financed through budgetary funds. RF legislation has set out specific forms and terms of financial government support for small innovation companies, a key element whereof is a system of funds that are intended to help support innovation and will be employed to finance small-business projects on concessionary terms. In recent years, there has been a continual increase in the number of venture funds with a clear-cut sectoral approach, mainly owing to brisk technological development in the real sector. A great many of these funds have been set up with the participation of state capital.

Keywords: **Small and Medium-Sized Enterprises, Agrifood Complex, Venture Capital Financing**

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INTRODUCTION

A key condition for Russia to be able to attain boosts in the social-economic development of its agrarian sector is the use of innovation processes in agricultural production. The need to activate innovation process is due to the sub-par technical and technological condition of the nation's agricultural sector and food processing industry, insignificant levels of innovation-related activity at science and research institutions, poor adapting to changing client demands, and low competitiveness levels within the agrarian sector.

This paper aims to provide a scientific rationale for developing effective theoretical and methodological approaches to fashioning innovation processes and methods for financing them, which are a strategic factor for economic security within the sector. Efficient production makes it possible to implement cutting-edge technology and equipment to ensure the innovation development of the agrifood complex. The evidence from practice suggests that there is a close link between the economic effectiveness of

production activity and innovations employed by enterprises. Without continually upgrading and modernizing technological systems, agrifood companies hardly stand a chance of delivering output that meets more exacting quality standards and, therefore, may ultimately fail to ensure sustainable enterprise and product competitiveness. Producers using outmoded technology do not stand much of a chance in the competition either against domestic or foreign innovation companies. Innovation processes are an effective tool for resolving financial, economic, and social issues within the agrarian sector. Concurrently, effectiveness is a necessary condition for being able to activate innovation processes within the agrifood complex.

METHODS

The study surveys and systematizes existing domestic and foreign instances. Innovations implemented within the agrifood complex are characterized by long pay-off periods, as well as significant financial risks which are associated with some of the sector's inherent characteristics: a lengthy production cycle, a low capital turnover rate, pronounced seasonality in production, and high dependence on loans. These appear to be the major factors behind the slow pace of the innovation activity of enterprises within the agrifood complex.

The methodological basis for the study is a combination of a systemic approach, cause-and-effect analysis, logical-mathematical modeling, and innovation theory. The theoretical basis is a set of works by leading Russian and foreign researchers and specialists in the area of management and economics. A concern of the highest priority at the moment is the issue of upgrading machinery and developing and assimilating cutting-edge technology to enable the efficient production and processing of the various types of agricultural output based on the latest scientific-technical achievements. This is quite rightly the deciding factor for mobilizing internal resources, as it may virtually be the only way to drive up economic growth and boost the business activity of companies within the agrifood complex.

Exploring the literature has helped the authors identify some of the most salient problems in the area of financing Russia's agrifood complex.

RESULTS

Current State of Russia's Agrifood Complex and Agrifood Policy

Currently, the governments in the US, Western Europe, Japan, and other developed countries employ lots of economic and administrative measures for supporting and protecting agriculture, as a whole, and agricultural producers, in particular [1]. Measures of this kind were used in the USSR as well.

Russia's market reform undertaken during the 1990s resulted in reductions in state support for agriculture, large farms getting privatized and fragmentized, the use of much of the domestic agricultural machinery getting discontinued, and more doors opening for

imported agricultural produce and equipment. Today, the nation is in need of the balanced development of all sectors within the agrifood complex, which is a mandatory condition for being able to resolve the issue of ensuring the nation's food security and providing it with sufficient amounts of agricultural raw materials [2]. Right now, the poor development of the processing industries within the agrifood complex and its production infrastructure is resulting in significant losses of agricultural output. There is an urgent need to tackle the social issues facing the nation's rural areas, the standard of living in rural areas being a lot worse than in cities. The social issues facing rural areas are having a negative impact on the economics of agricultural production, resulting in rural residents migrating to urban areas. There is a disastrous exodus of young rural dwellers, which is resulting in the Russian countryside gradually dying out amidst rapid population aging there. The real problem is that in the countryside there is no source of income other than agricultural activity. This forces agricultural producers to keep too many staff around to maintain social stability, which leads to declines in productivity and overall profitability within the sector. In many regions, there is a lack of specialists who may offer support in the way of management, organization, and consulting on issues related to the formation and operation of new market establishments within the agrifood complex. The current economic situation in the nation's agriculture is in homogeneous.

Table 1 illustrates the dynamics of production of the major types of agricultural output in Russia in the period from 1986 to 2015 and a forecast for 2020.

Table 1: Production of the Major Types of Agricultural Output in the Russian Federation (yearly average, million tons).

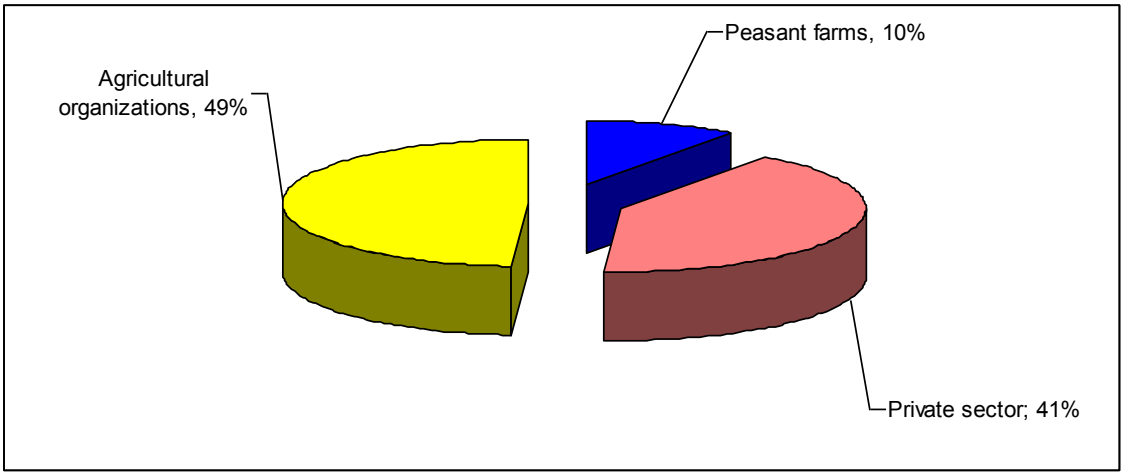
Product	**1986–1990**	**2006–2010**	**2011–2014**	**2015 (score)**	**2020 (based on the State Program)**
Grain	104.3	85.2	90.7	over 100	115.0
Sugar beet	33.2	27.2	41.4	37.5	40.9
Sunflower seeds	3.1	6.3	9.3	9.3	7.5
Potatoes	35.9	27.3	31.0	31.2	31.0
Vegetables	11.2	12.3	14.9	15.0	16.2
Slaughter livestock and poultry (at slaughter weight)	9.6	6.2	8.3	9.2	9.7
Milk	54.2	32.1	31.2	30.6	38.2
Eggs, billion pieces	47.9	38.9	41.6	41.3	-
Note: Sourced from statistical collections by Goskomstat and Rosstat.					

Reduced foreign competition amidst the sanctions has resulted in growing revenues for large Russian agro-holdings and food companies. The RAEX (Expert RA) rating agency has documented the following increases in total receipts generated by enterprises ranked among Russia's 600 largest companies: a record increase of 32.1% posted in 2014 by 13 agro-holdings combined and an increase of 13.8% posted by 21 food companies combined against 12.7% posted across the industry as a whole. Similar

trends were observed in 2015 as well. More specifically, in 2015 the Rusagro group, ranking third in sales volume among Russian agro-holdings, registered a 21% increase on the same period of the previous year in receipts in a 9-month period. These results are, particularly, due to a number of top companies within Russia's agro-industrial complex engaging with international value chains – above all, the systems run by the world's top multinational corporations (MNCs). In 2014, total sales by 7 MNC offshoots exceeded $16 billion, which is 77% of total sales by Russia's 10 largest food companies. The Russian offshoots of the multinationals are turning now into quite efficient units within the parent MNCs. In 2014, for instance, sales by the Russian unit accounted for 7% of PepsiCo's combined global receipts and 12% of Bonduelle's (including 30% beyond the EU).

The structure of Russia's agricultural sector by type of business is illustrated in Figure 1. As we can see, most of the production is accounted for by agricultural organizations (49% of the entire output) and individual household plots (41%).

Figure 1: Structure of Russia's agricultural sector by type of business (source: 2014 Rosstat data).



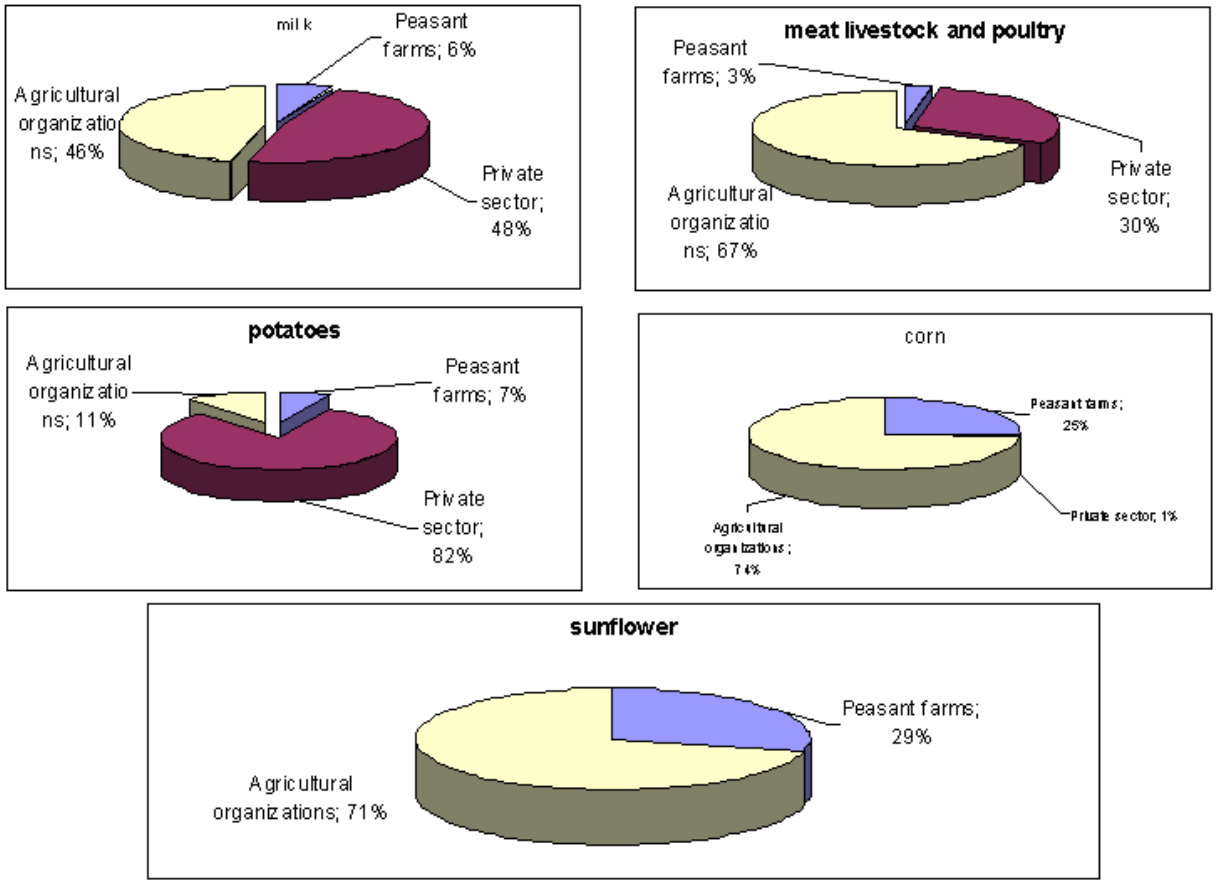
As regards the sector's structure by output produced by agricultural business entities, the largest quantity of milk is produced by individual household plots and agricultural organizations, that of livestock and poultry meat, as well as grain, – mainly by agricultural organizations, and that of potatoes – by individual household plots (Figure 2).

Major Areas for the Formation of an Innovation System within the Agrifood Complex

The evidence from overseas experience indicates that the agricultural sector generates the largest gains in innovation activity when agro-industrial production is predicated mainly on innovation founded on whole new technology. Currently, Russia is significantly behind most of the developed countries in terms of the level of innovation in

the agricultural sector. This mainly is due to the slow pace of the process of technical and technological modernization of agricultural production. Due to their insolvency, most farmers are unable to make use of the latest technology. The share of high-tech products in Russia's agrifood complex is just 0.3% of its overall GDP, whilst in most of the developed countries it is over 20%. State budgetary subsidies for the agro-industrial complex amount to just 0.5% of GDP, whilst in most of the developed countries the figure ranges between 20 and 70%. Expenditure on research in developed countries is 2.5–3.5% of GDP, and in Russia the figure is less than 1% [3].

Figure 2: Structure of Russia's agricultural sector by output from agricultural producers (source: 2014 Rosstat data).



The nation's chief documents on the development of innovation processes in the agrifood complex, like the State Program for the Development of Agriculture and Regulation of the Markets for Agricultural Output, Raw Materials, and Food for the Period 2013–2020 [4], set out the key aspects of the formation and development of innovation processes in the agrifood complex, which include the following:

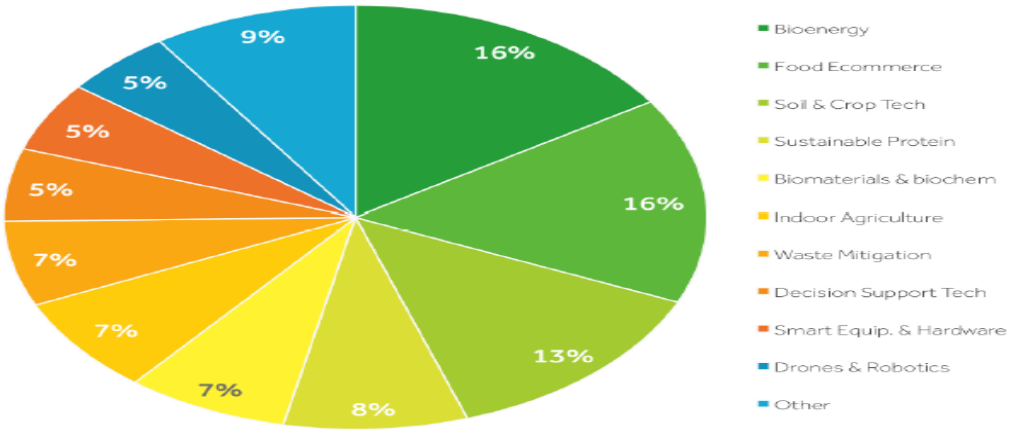
- There are numerous types of agricultural production and derived agricultural products;
- The country's regions are differentiated in terms of conditions of production;

- The technology of production depends on natural and climatic conditions;
- There are long timeframes between the production of particular types of agricultural output and processing them;
- Agricultural producers are fragmentized territorially;
- Producers are separate (at all stages) from organizations concerned with scientific-technical products;
- There are diverse forms of interaction and relationship between agricultural producers and innovation entities;
- There is a lack of a clear-cut and well-founded organizational-economic mechanism for transporting scientific achievements across to agricultural producers, and the sector is lagging behind in domesticating innovation.

When it comes to the development of innovation processes in agricultural production, an important factor to consider is seasonality, which implies that plants may have an annual or perennial life cycle. The specificity of the innovation process in the agrifood complex lies in the need to carry out, in a sequential manner, complex production operations during particular time periods, these operations often time-limited.

The innovation process involves the creation, development, and distribution of new technology. Producers of innovation create competitive advantages for their clients [5,6]. It begins the moment there is an idea and ends when this idea is implemented. When it comes to the structure of the innovation process, as a whole, and as applied to the agrifood complex, the process is normally divided into separate structural parts.

Figure 3: Segmentation of investment in the agrifood complex, % of the total volume of investment (source: TechCrunch).



On the whole, the situation with respect to the development of the innovation process in the agrifood complex is such that it is currently lagging behind other sectors of the economy [7]. Therefore, a priority is to boost government support for innovation in agriculture. Figure 3 illustrates the segmentation of investment in the agrifood complex.

In recent years, most companies producing innovation (except for those in science-driven regions) have lacked the finances necessary to actualize innovation projects in production. To this end, the government has worked out several programs of state support for innovation enterprises within the agrifood complex involved in modernizing production [8]. The government has allocated some 5,470 million rubles to fund the program 'Implementing Promising Innovation Projects in the Agro-Industrial Complex' over the period from 2013 to 2020, with a breakdown by year as follows: 2015 – 810 million, 2016 – 849.7, 2017 – 890.5, 2018 – 932.3, 2019 – 973.3, and 2020 – 1014.2 million rubles [8].

Much of the funding for enterprises within the sector is needed for acquiring state-of-the-art equipment, upgrading the material-technical means (labs and diagnostic equipment; production lines), and being able to provide consulting services in the area of technology transfer. The primary sources of funding for the implementation of the above measures are the federal budget and consolidated budget of the Russian Federation, as well as certain extra-budgetary sources [4].

The sector expects a total of 420 innovation projects implemented over the entire period 2015–2020. Innovation implemented over the above period in crop farming, including projects related to resource-saving technology and precision agriculture, is expected to total 10 million rubles worth of projects on 73 projects (hereinafter "units") and 30 million on 41 units, and in stock farming, including projects related to resource-saving technology, it is 50 million rubles worth of projects on 42 units, 100 million on 38, and 150 million on 41 units.

Innovation in agricultural land amelioration implemented over the period 2015–2020 is expected to total 20 million rubles worth of projects on 20 units, 30 million on 20, and 50 million on 13 units, while that in plant- and animal-origin agricultural output processing is expected to amount to 50 million worth of projects on 38 units, 100 million on 28, and 150 million on 31 units.

Innovation projects on the creation of alternative sources of energy implemented over the 2013–2020 period are expected to be worth 20 million rubles, and, including those related to bio-fuel production using agricultural waste, total 13 units, while other innovation projects are being allocated 5 million rubles on 22 units [8].

Specificity of the Funding of Enterprises within the Agrifood Complex

The need for financial support for the agrifood complex is associated with the specificity of its component, agriculture, as an industry crucial to ensuring Russia's food security [9]. In addition to the above factors, this sector is also characterized by the slow and ineffective development of the market for agricultural loans, low cost-recovery rates posted by agricultural enterprises, the sector's inherent dependence on the natural environment, and other factors.

A crucial source of investment funding in the agrifood complex are large Russian and foreign companies. Many foreign companies that have processing plants in Russia fund companies that supply agricultural raw materials to them. Right now, funds are being mainly invested across the following areas within the agrifood complex:

- The food industry (meat and milk processing);
- The processing industry, including that within the fuel-energy complex;
- Subsidiary companies that are part of holdings specializing in the production and deep processing of agricultural raw materials.

Russia's unstable macroeconomic situation has had a negative impact in terms of potential increases in venture market volumes. However, overall across 2015, the market and the venture ecosystem demonstrated a certain safety margin. The total volume of deals within the venture ecosystem rose in dollar terms and totaled $2.19 billion, a 31% increase on the previous year. In 2015, the largest was a deal associated with the exit of a group of investors from Avito, worth $1.2 billion. Exclusive of this deal, the total volume of deals within the ecosystem in monetary terms is $0.99 billion dollars in the overall venture market volume. However, once again, the market and the venture ecosystem displayed a safety margin overall across 2015. The investment policy of venture funds is aimed today at seeking out and attracting projects in promising areas possessing export potential [10,11]. The major objective behind this kind of policy is the development of innovation projects with high growth potential and future potential for generating gain through the production of sought-after products [12].

The agricultural sector needs "long" monetary funds, and venture funds and direct investment funds may offer capital for an average period of 5–6 years. However, an obvious advantage of this type of investment, versus regular loans, is that there is no security deposit required and no regular payments need to be made once the funds are invested. Unfortunately, the financing of venture companies consists 90% of borrowed capital, and only 10% comes from one's own purse, while a positive ratio for a project is 70 to 30% [13,14].

In 2015, a total of 21 direct investment funds were launched within the Agrotech segment around the world (Figure 4).

Venture fund investment policy is aimed, among other things, at seeking out and attracting promising projects in sectors with export potential [15,16]. Developers are looked to for innovation projects with high growth potential and potential for generating salable output and gain through personal and borrowed funds being invested in these projects at different stages in its development [17].

One can speak today of a global trend indicating a growing investor interest in the agrarian sector. A notable trend to emerge in the past few years, including in the US, is the creation of additional support institutions and venture funds that invest in scientific research projects dealing with agriculture. Investors who 20 years ago prioritized IT, biotechnology, and medical projects have, by contrast, increasingly favored in recent

years the formation of funds for financing R&D in agriculture [17].

Figure 4: Direct investment funds within the Agrotech segment (source: Food+Tech Connect [18], https://foodtechconnect.com/2015/01/15/21-food-agriculture-focused-funds-launch-in-2014/).



Foreign investors are investing in those spheres of agricultural production where there are guarantees of these areas being put to highly effective use and generating maximum profits [19,20]. In 2012, 3/4 of the shares of the Penza-based company Rusmoloko were acquired by OlamInternational Ltd (Singapore). The holding Axzon (Denmark) bought a pig-breeding complex in Krasnodar Krai. Nearly 900,000 ha of land in European Russia is currently being worked by agro-industrial companies from Sweden, Finland, and the Czech Republic. In Primorsky Krai, Koreans and the Japanese have been investing in growing annually up to 125 tons of soybeans and corn, 30,000 tons of fodder wheat, and 80,000 tons of rice. There is a program underway for interaction between Russian agricultural enterprises and Korean investors. Among the companies considering the possibility of investing in Russia's agricultural complex is the Vietnamese concern TH True Milk. Presently, some of China's largest banks and corporations (namely, Agricultural Bank of China, China Construction Bank, ICBC, and Sinolight Corporation) may take up a number of projects with the Russian-Chinese Fund for Agro-Industrial Development, set up with the participation of the Far East Development Fund and the Asia-Pacific Food Fund Management Company (China). A fund has already been set up in partnership with China, an investment fund committing as much as $2 billion to agricultural projects in the Far East, following the signing of an agreement in Beijing. In addition, an agreement

has been reached providing Russian agricultural enterprises, for the first time ever, with quotas for the supply of grain to China. Right now, the Russian-Chinese Fund for Agro-Industrial Development is considering 27 investment projects in the Far East. These projects are aimed at the development of crop farming (growing soybeans, corn, and rapaseed), stock farming (pig-breeding and dairy cattle breeding), and the infrastructure of the agro-industrial complex (creating transshipment and warehousing facilities) [20].

Right now, investors are increasingly interested in the so-called “agricultural wing” of the biomedical cluster developed around Russia’s largest innovation center Skolkovo. The facility is focused on projects in crop farming (methods for creating new varieties and selection; soil preparation and improvement; technology related to precision agriculture and productive land use, crop harvesting, and output storage), stock farming (cellular and genetic engineering biotechnology; livestock reproduction; veterinary medicine and feeding; nature conservation activities in stock farming), and industrial biotechnology in agriculture (namely, biocatalysis and biotransformation; metabolic engineering; development and optimization of fermentation processes) [17].

Other areas for investment activity include agricultural output processing (including technology related to packaging, product quality and safety control, and output storage) and forest management (namely, molecular mapping for the identification and genetic monitoring of forest resources; creation of digital atlases for the genetic variation of the major forest-forming species; development of molecular-genetic methods for tracing the origin of wood to help combat illegal logging; development of effective and ecofriendly methods for the utilization and management of waste from the forest and paper industries).

Agricultural projects take somewhat less time to commercialize compared with other sectors. This, among other things, is due to lower regulatory barriers and to the industry being more than ever eager and willing to implement investment projects.

DISCUSSION

Expanding the practice of venture financing of the most effective methods of conducting agricultural activity – above all, methods aimed at boosting the efficiency of agricultural production, expanding the product range, developing the production of high-performance fertilizers for the private sector and agricultural enterprises – will facilitate boosts in the well-being of the nation’s population, declines in the prices for agricultural produce, and improvements in its quality.

The Russian economy is currently operating in a climate of sanction restrictions. When it comes to the consumer market, questions remain as to whether one is using the right methodology to gauge the effects of the embargo. It, however, is worth noting that growth in national production has facilitated some boosts in the physical availability of food. In 2014, the nation’s self-sufficiency in grain crops and potatoes was 97–99%. Russia has almost attained the objectives targeted by the state program and is now 82–97% self-sufficient in sugar and vegetable oil [21]. Of vital importance is the ability to

overcome the antagonism between the interests of farmers, food processing enterprises, and science, which ought to be based on the development of vertically-integrated market structures on mutually beneficial terms. In large part, this has been possible due to the unification of production and financial resources to ensure a full-cycle process – from raw materials through to the finished product and its use. Going forward, this should help resolve issues in large-scale enterprise restructuring and deliver larger agricultural production volumes at consistent and high quality.

CONCLUSION

The evidence from experience indicates that the food embargo is an important, if insufficient, condition for being able to attain rational import substitution in agriculture, embark on a path of sustainable economic development, and turn the sector into one of the major drivers of economic growth in Russia. This will require working out, based on Russia's Food Security Doctrine, a long-term integrated agrifood policy intended to join up the production-economic and social-spatial components and expected to contain clear-cut strategic and tactical (sectoral and regional) benchmarks. It is crucial to provide the necessary material resources and institutional-legal instruments that is in keeping with the requirements set by the World Trade Organization and the principles and mechanisms underlying the development of a common agrifood policy as part of the Eurasian Economic Union partnership and the coordination of actions within the agrifood sphere as part of other possible regional (SCO) and megaregional (BRICS) integration efforts. Under these conditions, a key strategic objective in the venture financing of investment projects in the agrifood complex will be obtaining access to cutting-edge technology with a view to bringing it into the sector.

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