

Managing the Russian Agro-Industrial Complex During the Pandemic in the Context of Digitalization

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Abstract

The article proves that the agro-industrial complex of Russia is a set of industries connected by economic relations in the field of agricultural production, distribution, exchange, and consumption of agricultural products. In the context of the pandemic, the sustainable development of the agro-industrial complex of any country can be significantly shaken, but the conducted study proved that these adverse conditions did not have a significant impact on the Russian agricultural complex.

To develop fundamental science in the field of agriculture, the authors present a graphical interpretation of the interaction of factors that affect the performance of the agro-industrial complex, as well as propose a model of the management structure at the state level, based on the characteristic aspects of the agro-industrial complex management.

One of the key factors in ensuring the profitability of agricultural enterprises is subsidies allocated from budgets of various levels. Therefore, the article pays great attention to legislative materials reflecting the financing of agricultural producers' activities.

Keywords

Agro-industrial Complex, Agriculture, Food Security, Agricultural Machinery, Agricultural Products, National Projects and Programs.

Introduction

The relevance of the study of the agro-industrial complex of the Russian Federation is because Russia is an agrarian country, where agriculture is recognized as one of the priority areas of economic development. This is because the agro-industrial complex provides the country with food, and contributes to increasing the level of economic security of the country. Agricultural products affect the trade turnover of Russia and account for 12.4% of the structure of Russian imports. Therefore, the Government of the Russian Federation faces many challenges to form an effective development of the agricultural sector. One of the tools for solving the problems facing the government is the development and implementation of a priority national project that will contribute to the implementation of measures to support national agriculture. In 2012, the State program of development of agricultural industry and regulation of the markets of the agricultural products, raw materials, and food was approved. This program was adjusted and edited in the following years. In 2016, the Federal scientific and technical program for the development of agriculture for 2017-2025 was developed, which was supplemented by the subprogram "Development of potato breeding and seed production in the Russian Federation" (Tsypin, Vesnin, 2017). Analyzing the list of documents related to state policy in this area, one can state the fact that they are aimed at implementing certain measures in several areas:

1. Improving the level and quality of life of the rural population.
2. Creating general conditions for the performance of agriculture.
3. Developing priority sectors of agriculture.
4. Improving the organizational and financial infrastructure of the industry.
5. Improving mechanisms for regulating the agricultural product market.

Despite such a serious list of areas presented in the documents, the Russian economy faces many problems. Russian scientists have made a significant contribution to solving the problems of the industry under consideration. These are A.I. Altukhov, L.F. Kormakov, A.R. Kulov, A.V. Larionov, V.I. Nechaev, O.A. Rodionova, Yu.V. Chutcheva, and many others. These researchers revealed the factors that contribute to the effective development of the agricultural sector, analyzed the measures implemented to support agricultural producers, and proposed rules for allocating subsidies. Nevertheless, at present, many issues remain unresolved. Moreover, the severity of these issues has increased due to the restrictive conditions caused by the pandemic.

Methods

The agro-industrial complex is a vital part of the country's economy, which includes industries for the production and processing of agricultural products, bringing these products to the consumer, as well as industries that provide the production means for the agro-industrial complex (Ovchinnikova, 2020). Constant transformations in the country, the influence of external and internal factors, sanctions, the pandemic, the material deterioration of agricultural machinery and fixed assets caused both the negative aspects on the one hand and the positive ones on the other. Figure 1 shows the factors influencing the development of agriculture, which contribute to understanding the essence of the development processes of the national economy in the field of agriculture. To solve the problems of forming an effective agricultural production that ensures the food security of the country, in-depth knowledge is required not only in the essence of the economic development processes but also in the field of managing these processes.

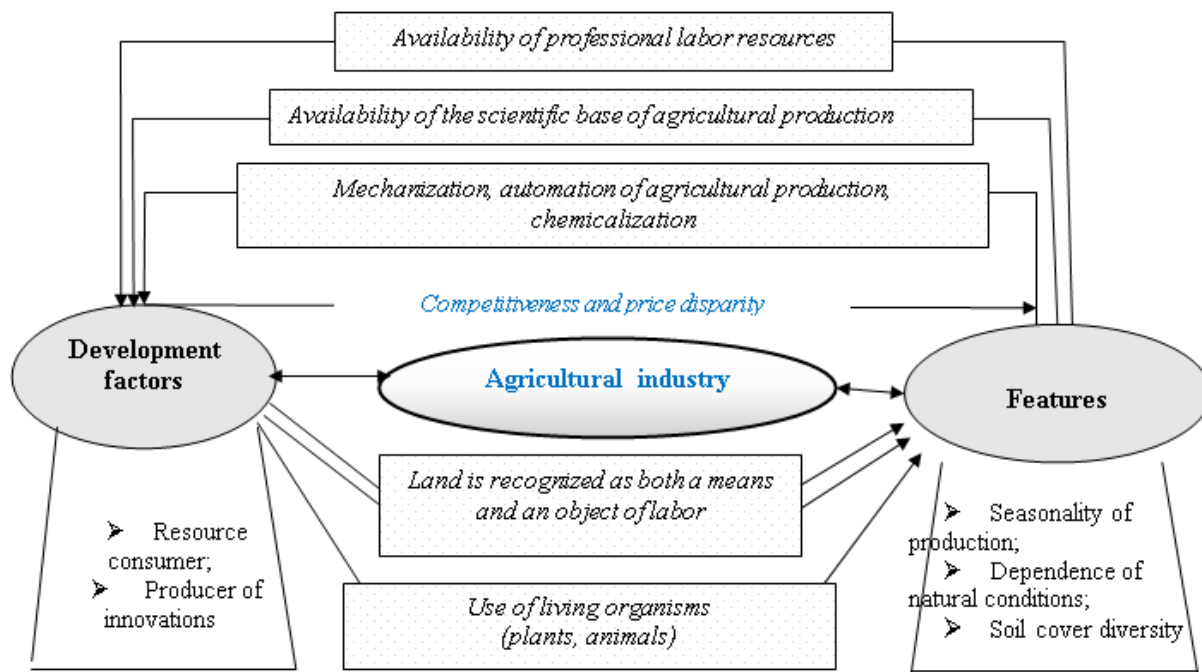


Figure 1 Graphical interpretation of the interaction of factors affecting the development of agriculture

The production of agricultural products depends on the successful functioning of all sub-sectors of the national economy. The agro-industrial complex represents the total volume of branches of the national economy associated with the development of its production and bringing agricultural products to the consumer. Therefore, the characteristic properties of the management structure of the agro-industrial complex,

which includes the managerial goals and objectives, can be schematically presented in Figure 2.

The main goal in the management of the agro-industrial complex is to meet the public needs for food and agricultural raw materials while rationally using resources. This goal can be achieved due to the effective functioning of all links of the system combined into the model of the agro-industrial complex.

The first link includes the service industries of the country's agriculture, which includes agricultural engineering, basic chemistry, breeding, and land reclamation. The industries included in this area provide resources for the production process, create the basis for the industrialization of agriculture, and contribute to the normal functioning and development of the remaining links of the complex.

The second link is very agriculture, namely, crop production, animal husbandry, viticulture, fishing, beekeeping, and sheep breeding.

The third link includes industries that process agricultural products.

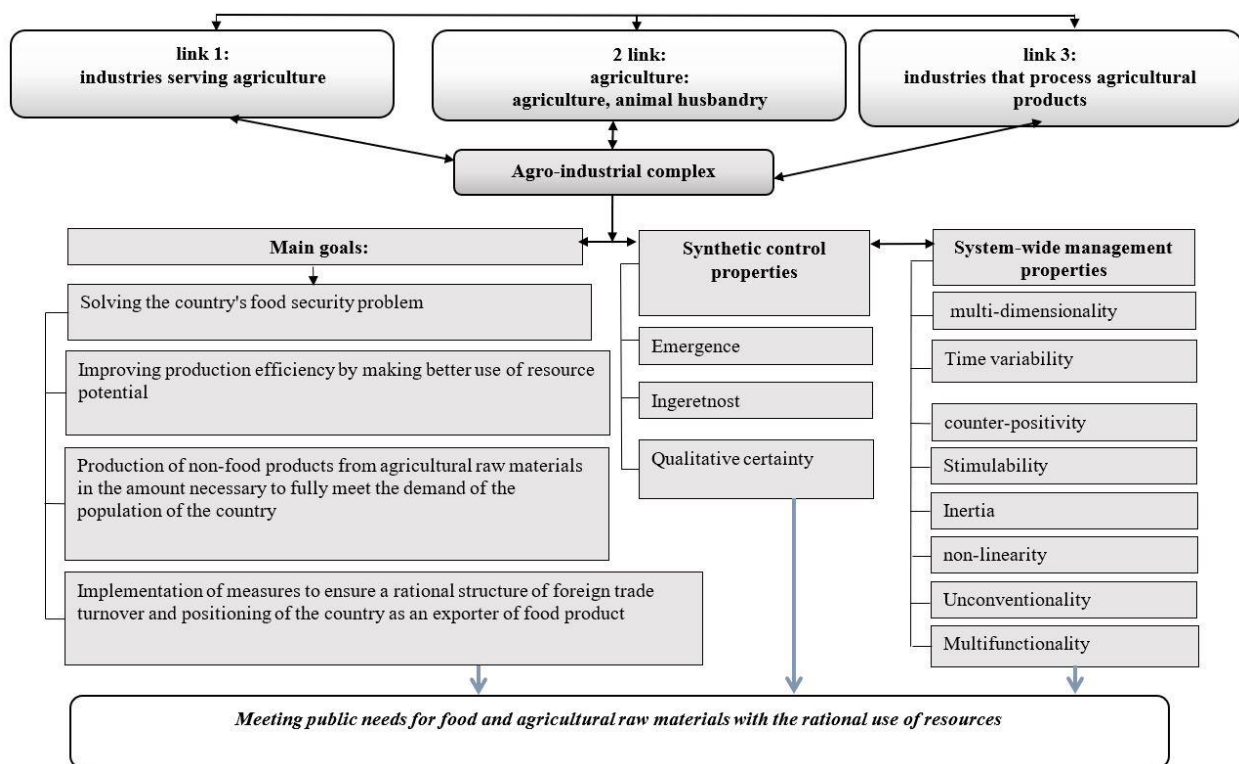


Figure 2 Properties-characteristics of the management structure of the agro-industrial complex at the state level

The main principle of managing the agro-industrial complex at the state level is ensuring that all the links interact with each other in an integrated manner based on a free market, namely, a balanced ratio of supply and demand (Glagolev, Vaganova, 2013a). It is possible to achieve such a balance through state regulation. The state annually sets and reviews minimum prices for the most important agricultural products, protecting producers from bankruptcy due to a possible sharp drop in prices. Another government management tool is to protect the domestic market against cheap imports and excessive price fluctuations through a system of additional import duties. Therefore, for example, in the EU countries, food prices are significantly higher than the prices of the world market.

The described management tools are reflected in the state budget of the country, but all developed countries provide state support for agricultural producers. This factor is very clearly evident during crisis developments, such as sanctions and pandemics when the external market is closed to agricultural imports and many productions stop working.

The research results present the Russian agro-industrial complex, in which the key agricultural players are individual regions, such as the Krasnodar Territory, the Stavropol Territory, the Republic of Tatarstan, the Republic of Bashkortostan, the Belgorod Region, the Voronezh Region, the Volgograd Region, and the Rostov Region.

Results

In the current conditions of the pandemic in 2020, Russia has increased the production of agricultural products by almost 1.5% per month (Figure 3). The total volume amounted to one trillion 327.4 billion rubles. In August 2020, the increase was at the level of 4.1%. For nine months of 2020, the production of agricultural goods reached 4.2 trillion rubles (Federal State Statistics Service of the Russian Federation, n.d.). A favorable result was observed in the grain market – 121.9 million tons, which is more than 12.1% more than a year earlier. However, due to the drought and early frosts in 2020, the harvest of beets and many other vegetables fell.

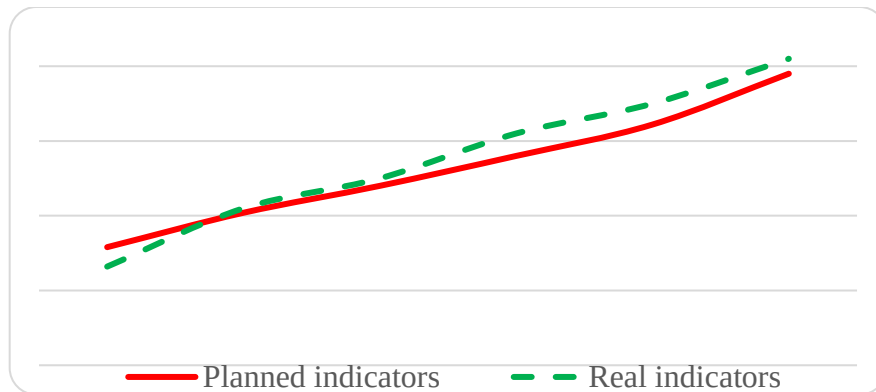


Figure 3 Russian agricultural production growth index for 2020

The livestock population, in particular, pigs and cows, as well as poultry, also increased slightly in 2020, while the number of sheep and goats, on the contrary, decreased by 1.1%. Milk production in Russia in 2020 increased by 2.7% and reached 24.9 million tons. At the end of 2019, the growth was 4-4.5%, or 650-700 thousand tons (Anpilogov, 2021).

Against the background of the post-Soviet republics, Russia's results in the production of agricultural products are much higher. Thus, in the 1st quarter of 2020, the agricultural production amounted to 344.5 million US dollars; in the 2nd quarter – 367.5; in the 3rd quarter – 368.5; and in the 4th quarter – 389.5. These data are illustrated in Figure 4 (Agro-industrial complex. Statistics of the Eurasian Economic Union, 2020).

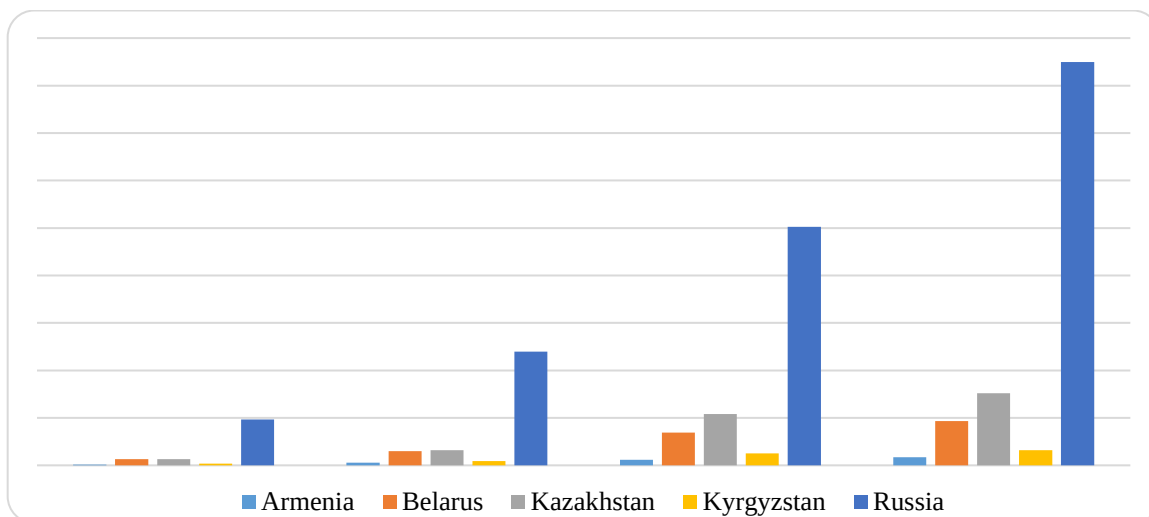


Figure 4 The agricultural production volume in current prices, million US dollars

Source: EEU statistics, n.d.

As it was already noted at the beginning of the article, all system links of the agro-industrial complex should work in a balanced and integrated manner. Considering the second link, one can say that it proved to be perfectly functioning in the context of the

pandemic, which was not negatively affected by the restriction factor. To maintain such agricultural production rates, the state should pay more attention to the first link, which concerns agricultural machinery, basic chemistry, breeding, and land reclamation. This link is characterized by certain crisis manifestations. The main one can be called the wear and tear of the material and technical recourses of the agro-industrial complex, which is evidenced by the data presented in Table 1.

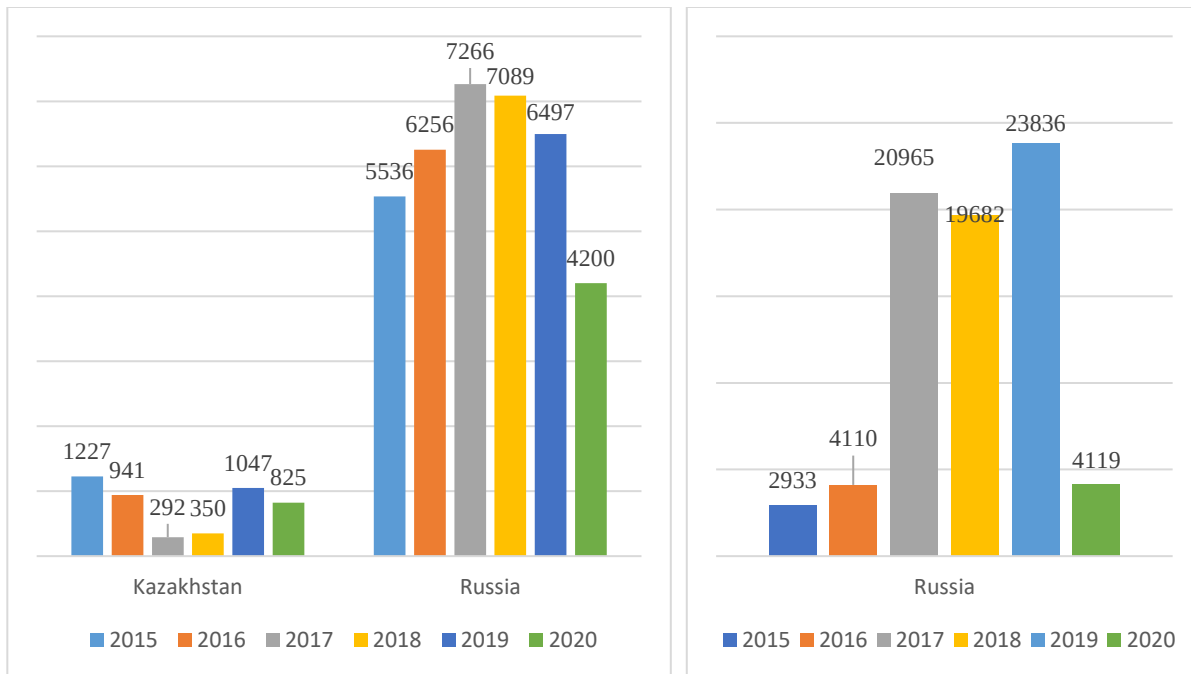
Table 1 Depreciation of fixed assets in agriculture, forestry, and fisheries (at the end of the year; as a percentage)

	2015	2016	2017	2018	2019	2020 Preliminary data
Armenia	46.3	43.7	37.0	33.9	...	32.3
Belarus	38.5	38.5	... 38.9	38.7	39.5	38.6
Kazakhstan	17.3	16.5	16.2	15.9	...	15.1
Kyrgyzstan	32.0	33.4	36.3	38.6	...	37.7
Russia*	41.6	41.2	38.2	38.2	38.2	38.0

Source: Federal State Statistics Service of the Russian Federation, n.d.

Based on the data presented in Table 1, it can be judged that in Russia, over the past three years, the depreciation of fixed assets of production in agriculture has remained at the same level. This positively characterizes the material and technical recourses of the agro-industrial complex. However, for agriculture to develop, it is necessary to increase the pace of machine-building production.

In 2019, 6,497 tractors for agriculture were produced in Russia, which is by 592 pcs. less than the production volume of the previous year (Agro-industrial complex, 2020). Already in September 2020, the production of tractors for agriculture increased by 32.3% compared to the same period of the last year and amounted to 545.0 pcs. (Figure 5) (Main macroeconomic indicators of the Republic of Armenia, n.d.; The production of agricultural machinery in Kazakhstan..., 2021; Production and market of agricultural tractors in Russia in 2020, 2021).



Tractors Plows

Figure 5 Production of the main types of agricultural machinery (pieces)

The leader in the tractor production for agriculture (in pcs.) of the total volume produced in 2019 was the North-Western Federal District with a proportion of about 55.1%. In 2020, the average producer price for tractors for agriculture increased by 20.6% compared to last year and amounted to 4,811,193.9 rubles/piece.

A favorable factor in the development of the agro-industrial complex is the increase in exports of Russian agricultural machinery over the past three years. Thus, in 2018, sales increased by 40%, in 2019 – by 30%, reaching 15.9 billion rubles.

Among the 38 countries, where Russian agricultural machinery is exported, a large share falls on the CIS countries, followed by the European Union, Africa, and the Middle East. So, exports to Germany last year in monetary terms increased by 4.6 times, Austria – by 4.5 times, the Czech Republic – by 2.9 times, Bulgaria – by 2.1 times. Deliveries to France increased by 84%, the Netherlands – by 73%, Kyrgyzstan – by 51%, Hungary – by 44%, and Kazakhstan – by 29% (Federal State Statistics Service of the Russian Federation, n.d.). Today, exports account for more than 10% of the total production of agricultural machinery in Russia. In 2020, Russian enterprises produced agricultural machinery worth 149 billion rubles, with an annual increase of 29.6%. As market participants admit, it is domestic demand that spurs exports, namely, the powerful production base created in recent years in Russia makes it necessary to actively look for new markets where additional quantities of agricultural machinery can be sold. Despite

such successes of Russian agricultural machinery manufacturers, the Western European countries that are part of the EU, remain the leaders of export growth (Agro-industrial complex, 2020).

To develop the agro-industrial complex and increase the export of Russian agricultural machinery, the government of the Russian Federation has been subsidizing the domestic manufacturers of agricultural machinery for several years. Resolution No. 1432, adopted in December 2012, has been developed and is being implemented, which provides state support to agricultural machinery manufacturers registered in Russia for more than three years, having a full production cycle, a dealer and service network in at least 40 regions of the country. Such measures of state support made it possible to create a modern machine-building industry in Russia, using a large volume of the domestic agricultural market as a "fulcrum" and a market lever (Glagolev, Vaganova, 2013b).

According to Rosspetsmash¹, Russian agricultural machinery in 2020 already occupies 58% of the domestic market, and this year, despite the pandemic, it can win up to 2/3 of the market share.

We propose to achieve an increase in the efficiency of the agro-industrial complex by using the management structure proposed in Figure 2, where the goals, objectives, and features of the activities of the economic entities that are part of the agro-industrial complex are clearly defined.

Despite the positive dynamics of production and export of Russian agricultural machinery, there are many problems in this economic sector. One of them is the presence of unprofitable enterprises, whose total number is presented in Table 2 (Agro-industrial complex, 2020).

Table 2 Number of unprofitable agricultural organizations

	2015	2016	2017	2018	2019	2020 Preliminary data
1	2	3	4	5	6	7
Number of unprofitable organizations (units)						
<i>Belarus</i>	502	437	219	246	239	233
<i>Russia</i> ¹	1,406	1,295	1,470	...	...	1,431
The share of unprofitable organizations (as a percentage of the total number of agricultural organizations)						
<i>Belarus</i>	34.9	27.9	15.7	17.9	16.5	16.1
<i>Russia</i>	24.4*	23.3*	25.4*	26.22 ²	...	25.8

¹ Agriculture, hunting, forestry, fishing, and fish farming.

² Crop production, animal husbandry, hunting, and services in these industries

Source: Agro-industrial complex, 2020, EEU Statistics, n.d.

¹ Russian Association of Specialized Equipment Manufacturers

We explain the presence of unprofitable enterprises by the fact that deterioration of agricultural production assets is faster due to their operation in unfavorable conditions, including aggressive environments (mineral fertilizers and pesticides), and thus, such enterprises need state support.

In the domestic economy, government support has historically been the main source of financing for agriculture. The difference between agricultural production and most economic sectors is that it is less efficient than others. The capital invested in agriculture brings less profit. Therefore, low-income agriculture is not able to participate equally (in comparison with industry) in intersectoral competition without external support, which is state support. That is why it is very important to attract investment in all parts of the agro-industrial complex and strengthen state support.

Discussion

In the course of further study, let consider the share of investments in agriculture, forestry, and fisheries in the total investment in fixed assets in several post-Soviet republics (Figure 6 and Table 3).

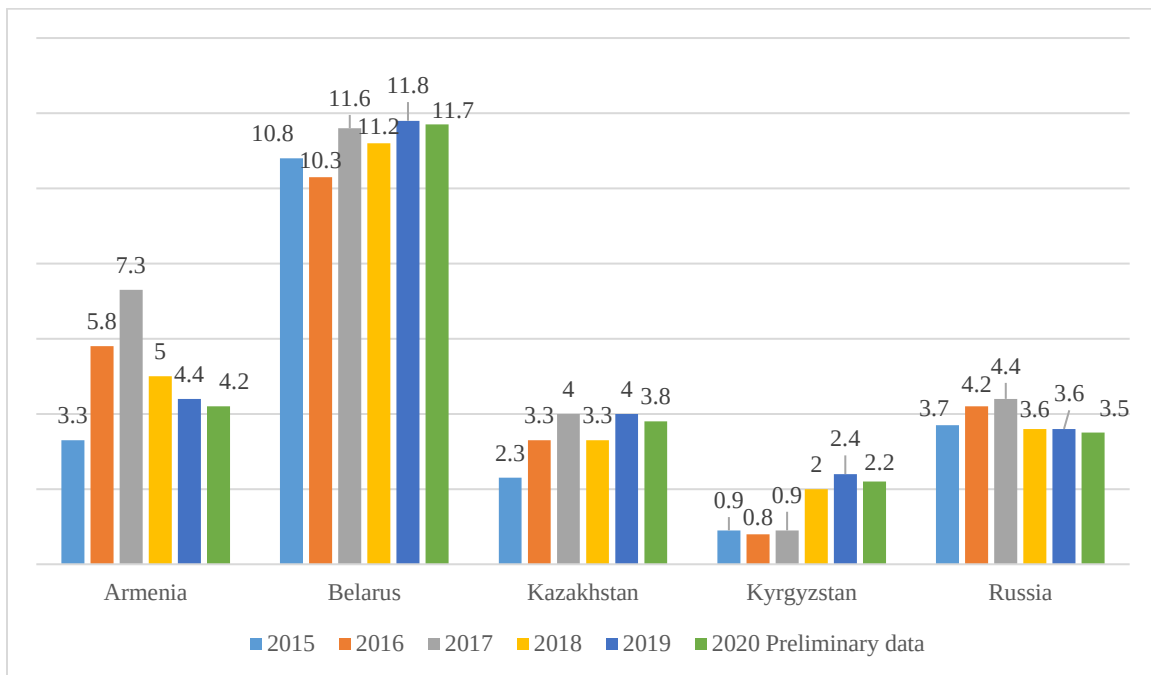


Figure 6 The share of investments in agriculture, forestry, and fisheries in the total investment in fixed assets of Russia and the post-Soviet republics (current prices; as a percentage of the total)

Table 3 Volume of investments in fixed assets, agriculture, forestry, and fisheries in Russia and the post-Soviet republics (in current prices)

	2015	2016	2017	2018	2019r	2020 Preliminary data
1	2	3	4	5	6	7
Billions of units in the national currency ¹						
<i>Armenia</i>	15.7	23.8	31.4	21.5	19.1	18.9
<i>Belarus</i>	22,333.8	1.9 ²	2.4 ²	2.8 ²	3.4 ²	3.3
<i>Kazakhstan</i>	163.9	253.7	348.5	365.0	495.0	480.1
<i>Kyrgyzstan</i>	1.2	1.1	1.3	3.1	3.2	3.0
<i>Russia</i> ³	518.8	623.4	705.5	781.5	838.8	830.2
As a percentage of the total investment in fixed assets						
<i>Armenia</i>	3.3	5.8	7.6	5.0	4.4	4.3
<i>Belarus</i>	10.8	10.3	11.6	11.2	11.7	11.7
<i>Kazakhstan</i>	2.3	3.3	4.0	3.3	4.0	3.8
<i>Kyrgyzstan</i>	0.9	0.8	0.9	2.0	2.4	1.9
<i>Russia</i> ³³	3.7	4.2	4.4	3.6	3.6	3.5
Eurasian Economic Union	3.9	4.3	4.6	4.5	4.6	4.5

¹Armenia – Armenian drams, Belarus – Belarusian rubles, Kazakhstan – tenges, Kyrgyzstan – soms, Russia – Russian rubles.

²The data is shown on the scale of prices effective from July 1, 2016 (taking into account the denomination of 10.000 times)

³Agriculture, hunting and forestry, fishing, fish farming.

Source: *Agro-industrial complex, 2020, EEU Statistics, n.d.*

As can be seen from Table 3, the main role in the entire system of state regulation of agriculture in each country is played by investment and price maintenance, which ensures the stability of agricultural producers' incomes and forms a price balance.

In Russia, with the transition to market relations, the price disparity constantly accompanies rural commodity producers, sometimes strengthening then weakening its impact (Titov, Vaganova, 2015). Therefore, in the Russian Federation, state support for agricultural production is carried out within the framework of federal laws and regulations. For example, the Decree of the Government of the Russian Federation of 26.11.2020 No. 1932 "On Amendments to Annexes No. 7 and 8 to the State Program for the Development of Agriculture and Regulation of markets for agricultural products, raw materials, and food". A new Agropgress grant of up to 30 million rubles has been introduced from 01.01.2021 for agricultural producers included in the unified register of small and medium-sized businesses (SMEs).

One of the key factors in ensuring the profitability of agricultural enterprises is subsidies allocated from budgets of all levels. But, unfortunately, the financing of the state program for the development of agriculture of the Russian Federation in 2021 will decrease from

300.643 to 257.535 billion rubles, as spelled out in the explanatory note to the draft federal budget for three years.

It is planned to resume financing of the agro-industrial complex in the planned amount of 300.012 billion rubles in 2022, and 296.367 billion rubles – in 2023. These indicators are lower than those defined by the current law (FZ-380). The decline was due to the prevailing conditions of the pandemic.

The financing of the federal project "Export of agribusiness products", which is part of the sub-program, may also be reduced by 7 billion 706.3 million rubles in 2021, and by 300 million rubles in 2022 due to the reallocation of budget allocations provided for concessional lending under the national project "International Cooperation and Export". The Government of the Russian Federation provides for the return of funds in 2022-2023 at the expense of budget allocations of national projects.

Summing up, it can be noted that state support measures are vital for the development of the agro-industrial complex, all three of its links. The infusion of funds into the concerned complex will contribute not only to the development of machine-building production in agriculture but also to the influx of labor. This measure will promote the attractiveness of the industry for specialists in all types of activities. So far, there are several problems in this aspect, which include the low standard of living of the rural population compared to the urban population, the lack of developed infrastructure in rural areas, the high labor intensity of production, and low wages. In addition to these difficulties, several problems are associated with the development of conditions for digitalization in the agro-industrial complex, which is manifested in the lack of highly qualified IT personnel.

Attempting to minimize the above-mentioned challenges, the government is developing and implementing agricultural development programs and projects both nationwide and in individual regions (Vaganova et al., 2020a).

As an example, one can consider the statistics for the Belgorod region. In this region, 5053.6 million rubles from the federal budget were allocated, and only 80% (4028.9 million rubles) were implemented (Vaganova et al., 2020b).

To expand the access of Russian agricultural products to foreign markets, it is advisable to provide constant feedback with foreign investors using a long-term horizon for planning and forecasting the effectiveness of the supply chain in investment projects (Vaganova et al., 2019).

Consequently, to effectively manage the Russian agro-industrial complex during the pandemic, it is necessary to increase the profitability of agricultural producers and improve the financial well-being of agricultural personnel. Expanding state participation in solving these problems, and improving agricultural policy primarily through strengthening state support and pricing, providing financial support for the purchase of fixed assets (agricultural machinery and equipment), implementing tax incentives, assisting in the implementation of digitalization, and improving the skills of agricultural workers through the offering state-financed openings in higher educational institutions of the country, should be reflected in federal laws which should spell out the rules for allocating subsidies for all above noted activities.

Conclusion

The agro-industrial complex consists of three main links, which include enterprises that produce agricultural equipment and are engaged in the production and maintenance of this equipment, enterprises that directly produce agricultural products, and enterprises that process and sell the final product delivering it directly to the consumer. All links should be integrated and interact with each other functioning effectively. Such balanced work can be achieved through proper management. We have developed a characteristic structure of the agro-industrial complex management at the state level, which will contribute to the achievement of the main goal of management – to meet the public needs for food and agricultural raw materials, ensuring the rational use of resources. The present research provides an opportunity to rethink the fundamental and practical foundations of developing sustainable, efficient, and competitive agricultural production.

The analytical material presented in the article makes it possible to confirm and verify the developments proposed by us.

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