

The Russian agro-industrial sector under the influence of stress factors

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Abstract. The paper considers the problems of dynamics of agro-industrial sector in Russia and the tendencies of its functioning in the contemporary context. The specific features of the country agrarian sphere, advantages and disadvantages of raw-material and agricultural orientation of the Russian economy are studied. It is emphasized that the agrarian sector is basic for the country development; the achievements in the field of providing the agrarian sphere with agricultural means of production are pointed out. Simultaneously, it is stressed that adaptation of the agricultural market to new conditions is connected with the factors of irresistible force influencing not only the national economy but also the whole world economy. The survival potential under the given conditions is connected, on the one hand, with the efforts of national producers, and, on the other hand, it directly depends on the transformation of financial relations and economic interrelations of the world community countries.

1 Introduction

The country agro-industrial sector represents a constituent part of the whole national economy, making it possible for the country to optimize employment, taking part in making gross national product and providing, to a large extent, food and economic security of the country.

The industries providing the agrarian sphere with contemporary means of production are basic for building a strategic vector of the country social and economic development, and in conjunction with industries providing the processing, storage, transporting of agricultural products, bringing them to customers, and also different infrastructural institutions that optimize interrelations among market entities form a special cluster which is responsible for providing the country with food products.

The country food security is directly connected with its economic security. The sphere of socio-economic interdependencies of branches and sectors of the economy reflects all potential possibilities of effective interaction of not only national economic entities, but it defines the possibilities of participating in the world economic relations, reflects the status of the country as a participant of the world community.

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The contemporary period has been, unfortunately, subjected to negative influence of a negative factor which concerns the whole network of the world economic interrelations.

In such conditions, to rely on fundamental spheres, being a layer of stability of the national economy, is of special importance. Agricultural enterprises, the flagships of agricultural engineering, producing means of production, are able to enforce stability of the country economy which is in unsteady condition and constantly gets shocks from stress factors, elimination of which is impossible at the moment.

The development of a competitive economy has become cluttered with a new problem – looking for very different ways of preventing economic collapse of the country, constant lockdown.

Integration of efforts of absolutely all entities of market relations, activating of the government control is becoming the only way of preventing economy default.

In such conditions, a primary objective is the formation of predominant clusters that are able to impart stability to the national economy and carry it to the path of stable growth. [1]

Constant attention is paid to the study of contemporary agricultural production. These problems are considered in the papers of many authors: A.A. Polukhin, K.I. Alekseev, A.G. Aganbekyan, O.N. Terentyeva, I.I. Goldin, K.N. Mischenko, I.V. Snomschikova and others.

Such theoretical studies may serve as the basis for further analysis of a complicated economic and geopolitical situation that has arisen in the world today.

Material and technical facilities of the agrarian sphere is one of the main conditions defining the possibility of successful stable development of the branches of agro-industrial complex in Russia. [2]

The hardships of recent years, connected with growth of competition in the world market, transformation of the world leading economies, switching to digital implementation of the world economic relations, have been completed with contingencies making a stressful impact on any economy, in spite of the rather firm position it takes in the contemporary world economy. [3]

The analysis of success factors and negative tendencies will help to determine reserves for stable economy on the background of negative tendencies. The sphere of agro-industrial production has always been a proper foothold for stability in Russia, and now it should be considered as the most important sphere which is able to make a substantial impact on the transformation of the country economy.

2 Materials and Methods

The subject of the study is the national economy which is under pressure of stress factors of our times. The study object is agro-industrial production as the basis of the Russian economy, which primarily absorbs all the changes occurring within the national economy and coming in the form of external interferences of economic, political and legal character.

The methods of quantitative and qualitative analysis, which serve as the basis for analyzing the dynamics of the economy and transformational changes in the socio-economic life of the country, are applied in the paper.

The analysis of statistical material makes it possible to determine the advantages of the agro-industrial sector that have been formed in Russia in recent years, as well as to focus on the problems that hinder further economic growth.

The quantitative method of study relies on the analytics of the statistical material characterizing the current state of the Russian agro-industrial production; it makes it possible to identify the processes of instability and develop a picture of fluctuations under the influence of a wide variety of factors.

The qualitative analysis focuses on the study of functioning of various causes and factors affecting fluctuations in the agro-industrial sphere. Therefore, it is so important to consider

in detail the potential capabilities of the given sphere accumulated over the past decades, while simultaneously studying some possible scenarios for the development of the country economy and identifying the hazards of endogenous and exogenous character.

In this paper theoretical and methodological approaches to the study of the specific character of agricultural engineering, functioning under the conditions of transformational changes in the economies of the leading countries of the world have been applied.

Analytical studies are applied to find out the reasons underlying the phenomenon under consideration. Statistical analysis is the basis of the evidence base.

3 Results

Today the development of agricultural engineering in Russia is based on the strategy of developing competitive high-tech agricultural technology and presupposes an up-to-date modernization of the agriculture that meets the requirements of up-to-date production and modernization of production of the basic range of agricultural products.

Period of validity of the State Program for the development of agriculture for 2013-2020 was prolonged up to 2025.

This decision is connected with the necessity of incorporating some presently topical federal projects into the development strategy, among which we should mention, first of all, the following: “Development of export of agricultural products”, “Digitalization of agriculture”, “Implementation of the support system for farmers and agricultural cooperation”.

The updated version of the program provides for significant state support in the agricultural sphere for the account of additional financing, the amount of which in 2021 - 2025 will be about 4.2 trillion rubles, including 2.33 trillion rubles through the state budget. Since 2018 the project stage of the state program has been implemented, the aim of which is to ensure food security of the country, further growth in exports, and as well as intensify the fixed capital investments of agricultural enterprises. According to this plan, by 2025 it is planned to increase the production of agro-industrial products approximately by 16%. [4]

For a long time, the agro-industrial sector of Russia has been facing a number of problems that hinder effective activity and planned development. Among these problems, we can name the following ones: poor provision of agricultural machinery that meets the requirements of up-to-date production targeted at competitive products manufacture, insufficient development of the processing industries of the agro-industrial complexes, the activity of which does not promote the planned strategic growth of the agrarian cluster in Russia. It should be noted that a rather large proportion of agricultural enterprises keep operating outdated agricultural machinery and old equipment, their degree of wear and tear is often more than 50%. [5]

The problem of finding large-scale sales markets being able to provide the agricultural producer with the possibility of permanent effective production cycle is also a pressing issue. It is overloaded with one more problem – the policy of intermediaries does not favor the increase of proportion of agricultural producers in the gross national product. And the sale problem for the Russian agrarian has always become complicated by high competition from foreign manufacturers which have been ahead of domestic enterprises for a long time in terms of marketing policy and sales technology.

In this situation, extensive supporting measures for the agricultural sector should be aimed at increasing the production and supply of the agrarian sphere, supporting all the participants of the agri-food market, increasing the profitability of both large agricultural companies and small farms. Export-import policy should meet the requirements of the national economy and facilitate strengthening the economic position of the national producer in the domestic and foreign markets.

The regulation of the market for agricultural products and raw materials in terms of their long-term production up to 2030 is carried out on the basis of the indicators laid down in the Agricultural Development Program. They are based on the indicators of gross output of agricultural products in recent years. The forecast indicators take into account both the volume of sales of agricultural products and the effect of external factors that determine the conditions of functioning Russian agricultural producers. Providing conditions for the competitiveness for the agricultural market will make it possible for domestic enterprises to work under the conditions of market competitiveness, while ensuring effective demand in the domestic market, as well as leveling the ratio of domestic production and imports of these products taking into account financial conditions, national currency rates, sanction correlations and other exogenous and endogenous factors.

We cite some figures characterizing the pace and volume of production of the agricultural machinery market. The volume of machinery production for the agricultural production sector in Russia in 2016 amounted to approximately 88 billion rubles. This indicator is 59% higher than that of the base year of 2015. However, at the same time, the volume of export deliveries of agricultural machinery also increased, it amounted to 7.7 billion rubles.

Since 2000, the production of crop products has had the tendency to increase steadily. In 2000, wheat production was about 60 million tons, in 2009 this figure increased to 76 million tons. The general trend towards the increase in cattle breeding and livestock raising remained with some fluctuations.[6]

Indeed, at the heart of the consistent growth of agricultural production there is an improvement of the material and technical base of the agro-industrial complex. Foreign and domestic markets constantly dictate requirements for the intensification of production and innovative trends in the sphere of agricultural engineering, the number and growth rates of agricultural crops for public demands depend on it.

However, the problems of the food market development are not given due attention. Modernization of food processes in the agricultural sphere is the basis for the formation of a modern, adapted to the realities, agricultural cluster.

The strategy for the development of the agro-industrial complex is being updated today due to the process of integrating the economy of Russia into the world economy and the country membership in the WTO. The modernization of production in the agro-industrial complex is part of the strategy for the development of the competitive agricultural production.

At the heart of the development of optimization processes and innovative activity in the sphere of agricultural engineering is the influence of a number of factors: the investment attractiveness of the Russian agricultural engineering and low-cost efficient production process of agricultural machinery. However, production costs reach 80% of the product cost.

Attention should also be paid to the low marginality of goods. Profitability of sales (marginality) is the ratio of the profit from the sale of goods to its total cost that is expressed as a percentage. There is a product that has a high profitability but it had been in the warehouse for a long time before it was bought; and there is a manufactured product which has less profitability, but constantly turns over. Here the manufacturer should pay attention to the profitability of goods, as well as the inventory return on investments.

It is the marginality of agricultural machinery sale by Russian enterprises and its volume that does not allow domestic companies to ensure high level of investments, necessary for sustainable and innovative development. Thus, the total volume of investments of the largest Russian companies, primarily Rostselmash, is 60 times lower than that of John Deere.

It should be taken into account that the current state of the agricultural cluster does not meet the requirements of the contemporary competitive market represented by many large western and American companies. Such negative trends accompanying the process of integrating Russia into the WTO highlight a number of problems in a number of segments of the agro-industrial complex.

The volume of the agricultural machinery market for tractors in 2020 reached 65 thousand units. Among them, 60 thousand tractors were imported, and only 5 thousand tractors fell on domestic enterprises.

Energy prices increase will undoubtedly lead to increase in prices for agricultural machinery. And this, under the conditions of hardening competition in this market, will result in the loss of one of the main competitive advantages of the Russian manufacturer – low prices.

However, researchers also note positive aspects in this situation. Such trends result in an increase in imports, which is inherent in a decrease in customs rates and increased state support for the agricultural sphere.

Recession in the agricultural engineering encourages again and again to look for the proper instruments and mechanisms so as to bring in balance the agricultural machinery market. The successful development of the given area in recent years has assumed the scenario of strengthening the developed modifiers within the framework of the national strategy of the country economic development. However, the present-day realities indicate on putting the investment projects on hold, freezing innovative industries, overall decline in production which can result in prolonged recession.[7]

For the first time, the Russian agricultural machinery market during the last five-six years fell by 20% and reached 32.3 billion rubles, as Kommersant notes, citing the analyst from the Ministry of Agriculture.

According to the available statistics, the production of grain harvesters fell by 24%, to 1.5 thousand units, all-wheel drive tractors – by 7%, to 853 units.

The instability of the economic and political situation does not allow today, in the context of changing priorities, to make accurate forecasts. But strategic decisions should provide for the whole assembly of internal changes and external influences that form the competitiveness of this sphere.

Positive forecasts, based on the confidence of the agricultural producers in the agro-industrial complex through to 2018 resulted in active development of investment programs, venture projects, and inspired hope for further efficient development of the enterprises resource potential.[8]

However, today we should take into account another scenario for the development of the agricultural engineering which is entering the period of commercial independence based on new mechanisms that do not always provide for the government support. In order to avoid the transition of the industry to a depressive state, we should take into account both one's own capabilities, and the national priorities, develop long-term projects for the development of the agricultural engineering industry.

But if we draw the proper conclusions from the current crisis in agricultural engineering, then the situation can not only be corrected, but also turned in the necessary direction for Russia.

A long-term policy of increasing production volumes, cooperation with the state, development of new measures of government support are able to orient the industry towards high efficiency, eliminating unpredictability.

It is necessary to unite the efforts of the state and entrepreneurs to develop the agricultural sphere, which will result in coordinated actions in the entire agricultural cluster.

Then good results will be achieved not only in agricultural engineering, but also in the whole industry and in all areas of public life.

4 Discussion

The decisive factor for the successful development of the agro-industrial sector is, indeed, the provision of the industry with agricultural machines, uninterrupted supplies of

agricultural machinery and spare parts, which ensure an efficient production cycle in the agro-industrial sector.

However, 2020 has made essential adjustments to this process, associated with drop in sales of agricultural machinery, delay or cancellation of supplies. This reflects the depressing impact of the pandemic, its direct and indirect impact on the economy as a whole. One of the significant consequences of this phenomenon is the rupture of uninterrupted ties between enterprises and dealers, the deterioration of the conditions for financing the process of providing the leading agricultural producers with agricultural machines.

According to the study, about 60% of dealers associate the drop in agricultural machinery sales directly with the pandemic. The volatility of currencies and the fall in the real exchange rate of the ruble make it impossible to fulfil contractual obligations. Among the main consequences of such an impact the following ones are distinguished: a rupture of supply chains (70%), an increase in delivery terms (68%), an increase in the cost of equipment and spare parts (over 50%). More than 70% of respondents also expect deterioration in financing conditions in the near future.

When forecasting the situation, we should proceed from the real conditions in which the economy is today, but it is also necessary to take into account the achievements that accompanied the functioning of the economy before the changes in the situation imposed by the pandemic.

In the beginning of the year 2020, the output of agricultural machinery in Russia increased by 30% year-on-year in monetary terms to 35 billion rubles. At the same time, shipments to the domestic market increased by 42% to 22.5 billion rubles. An increase in the output of Russian agricultural machinery was observed in many key items. The largest growth in quantitative terms, in particular, was recorded in the segment of grain harvesters – by 48% to 1.69 thousand units, balers – by 31% to 471 units, seeders – by 20% to 1.72 thousand units, mowing machines – by 16% to 688 units, all-wheel drive tractors – by 15% to 597 units, spraying machines – by 10% to 228 units.

Nevertheless, there was also a tendency towards a reduction in agricultural production in Russia due to a significant decrease in effective demand. So, according to Rosspetsmash, in January 2020 the output of equipment increased by 63%, then in March – by 23%.

The fall in the solvency of the national currency and the real income of the population gave rise to a negative trend in consumer activity. This, in turn, will result in investment problems in the agricultural sector as a whole, that will inevitably affect the entrepreneurial activity in the agro-industrial sector.

It should also be noted that difficulties affected the main flagship of the country agricultural engineering, Rostselmash factory. The previous reduction in production caused by changes in the government policy, replacement of the subsidy system with leasing policy, and changes in the reproduction process scheme affected both the farmers of the Don region, and the largest factory as a whole.

Despite the fact that the enterprise has sufficient potential, accumulated as a result of the realization of the advantages of the previous period, the imposition of the negative consequences of the pandemic, a partial shutdown of production can create a negative situation provoking financial and economic difficulties for the largest enterprise of the country.

All sectors of the national economy have experienced the consequences of the pandemic, stress factors form a negative vector of the economy strategic development. However, against the background of negative changes, the agricultural sector is doing much better than other sectors and branches of the national economy. Despite the sufficient provision of the industry with agricultural machines, the agrarian sector today suffers a shortage of agricultural machines and means of production for the development of the industry. The threat of supply disruption has existed all the year round and continues to be a threat to the industry today.

The leading top managers (for example, General Director of Rostselmash V.V. Maltsev) believe that the availability of components during the sowing and harvesting campaign is a decisive factor of the successful completion of the production cycle. In such conditions, it is logical to stake on the purchase of domestically produced equipment. Strengthening of the national currency directly affects the efficiency of the industry, increasing the competitiveness of Russian equipment, offering new export challenges. [9]

Another important problem directly related to the development of the agro-industrial sector is the country economic and food security. M. Mishustin notes a sufficiently high level of the results achieved in this area. Today, the task of further increase in agricultural products potential, in his opinion, remains a key task. According to him, small farming should be brought up to this process, which will make it possible to raise the level of profitability of its production and successfully participate in the formation of the country gross product. [10]

Therefore, the need for an adequate state policy remains one of the priority tasks in terms of the problem of developing the country agro-industrial sector. The uncertainty of the situation connected with the presence of stress factors should remain an impetus for the state for flexible application of the system of economic instruments for regulating the activities of economic entities.

State support for agricultural producers, first of all, has a positive effect on the improvement of the financial and economic condition of enterprises, makes it possible to create conditions for increasing the volume of agricultural production and improving its quality.

5 Conclusions

A number of processes that make a situation of uncertainty and hinder the stable development of the country agro-industrial complex can be identified. Among them are:

- a drop in oil prices in the second quarter of 2020 which means that the Russian economy could fall by 18%;
- a drop in real disposable income of the population by about 17%;
- decrease in the level of wages of the population;
- reduction of GDP;
- inevitable inflation.

As a result, the total damage to the economy sectors most affected by the pandemic may reach more than 17 trillion rubles (in the estimation of NRA). [11]

In order to support agricultural producers and help them to get through hard time, input suppliers are developing various anti-crisis solutions.

Along with the trends restrictive for the economy, elements of constructive anti-crisis leveling of the negative situation can be distinguished which will help to counter the crisis and develop new platforms for the stability of the national economy. The following processes can become the industry development driver:

- development of market infrastructure, contributing to the formation of adequate market relations between market entities;
- opening the borders of a number of countries for exporting Russian agricultural products;
- further digitalization of agro-industrial sector.

Indeed, foreign policy can also become an obstacle to successful development of the agricultural sector, but such influence cannot be decisive. The main risk is, of course, the potential global financial crisis, which can disrupt the stability of the relationships among the countries of the world economic cluster. [12]

The crisis, for which there are several essential prerequisites, can deliver a rather significant blow to the economy, and to a lesser extent – to agriculture.

The Russian agro-industrial complex has fulfilled the task of ensuring food security in almost all main indicators. According to estimation of the Ministry of Agriculture, in 2019 the volume of external sales of agricultural raw materials and foodstuffs exceeded \$25 billion with the planned value of \$24 billion. Roughly, the volume of agricultural exports in 2020 may be at the level of \$25-27 billion.

It is quite logical and necessary to increase supplies abroad in a situation of weak growth in domestic demand. This will contribute to maintaining the demand for agricultural products and will be an impetus for agricultural producers.

Table 1. Main indicators for monitoring the implementation of the Strategy for the Development of Agricultural Engineering in Russia until 2020

№	Index	Unit	2017	2018	2019	2020
1	The share of domestic equipment in the total sales of agricultural tractors	%	43.3	49.1	54.7	60
2	The share of domestic equipment in the total sales of grain and forage harvesters	%	59.8	62.9	68.9	68.9
3	The share of domestic equipment in the total sales of other agricultural equipment	%	52.5	57.2	62.7	68.8
4	The ratio of the Russian domestic market of agricultural machinery and the volume of export supplies	%	40.3	39.8	38.3	35.1
5	Agricultural machinery export volume	million rubles	72 531	86 262	100 423	114 888
6	Sales of agricultural machinery in Russia	million rubles	180 159	216 733	262 349	327 491

A huge number of factors affect the export volumes; among them are microeconomic, political, as well as force majeure circumstances, the presence of which in the country economy, unfortunately, has become habitual. The desire of many manufacturers to expand sales channels is a natural process. In the context of saturation of the Russian market, it is becoming more and more difficult to develop within the country. At the same time, it should be borne in mind that in other countries mainly raw materials will be in demand. Therefore, the policy of price regulation for products is decisive against this background.

However, this does not negate the need to promote Russian finished products to the world markets.

The main trading partners in regard to this type of product for our country are mainly the states of Africa, Asia, and the Middle East. Political stability in these regions is essential for the fulfilment of plans on export of agricultural products. At the same time, Russia is a member of the global production market. The optimal ratio of exports and imports of products

under the conditions of market volatility is a difficult task, the solution of which is impossible without the joint efforts of a manufacturer and the government. [13]

In the conditions of uncertainty of the market situation associated with the pandemic, the instability of the financial market, the instability of the exchange rate of major world currencies, violations of market contractual relations, the main tasks will be:

- full implementation of the export potential of the agro-industrial sector products;
- strengthening the ruble exchange rate through the production of competitive products and the possibility of participating in the global food market;
- provision of the agro-industrial sphere with agricultural machines and components that will make it possible to put into effect an uninterrupted production cycle;
- all-round reduction of cost of manufactured products and further search for ways to reduce production costs;
- the use of digital technologies in forming the agricultural cluster;
- activation of state policy and the search for adequate tools for the development and optimization of the agro-industrial production sphere.

Of course, government involvement is not limited to a policy of priority rating of economic development. It also implies direct financial participation in the form of support of the industries and sectors of the economy most affected by stress factors.

About 34 billion rubles are provided for compensatory payments in 2020, for incentive payments – 27 billion rubles. Speaking about the state policy related to the export-import mechanism, it should be emphasized that it is the export orientation that is the most favorable for the development of the agricultural sector of the country economy. In this regard, special attention should be paid to the development of tools for stimulating external sales, production subsidizing, credit mechanisms, etc. [14]

Since the tension in the economy does not allow market mechanisms to work in full force, government participation will be able to form the vector of optimal development for the agro-industrial production.

Table 2. The main vector of development of agricultural machinery in Russia can be identified

Vector Global Player		
Significant export volume	Technical modernization of production	Creation of new jobs

Motivation of individual industries, primarily the agricultural sector as the base for the national economy of Russia, will help to maintain the achieved positions and not to destroy the system of internal and external interactions of market entities in the short-term period. A sustainable economic growth that will persist in the next years of 2022 – 2025 may become decisive for further building up the potential of the country agricultural cluster.

According to the Ministry of Agriculture, we have the following indicators: profitability of agricultural enterprises in 2019, excluding subsidies, was 10%, and including subsidies – 14.6%. If enterprises are large, they can do without any financial support. But in order to maintain world positions, it is necessary to have a level of subsidies comparable to other countries. [15]

The main reasons for the low efficiency indicators of the Russian agro-industrial sector can be a high proportion of manual labor, a low level of automation and implementation of digital technologies, an outdated stock of agricultural equipment, and a lack of updating of management and production systems. As long as these problems remain, the government support will play a key role in the development of the agro-industrial complex.

However, in spite of everything, the agricultural sector still remains promising and attractive for investors today.

Acceleration of scientific and technological progress, further implementation of innovation policy and digitalization of all spheres of the economy, including the agro-industrial sector as well, are, indeed, a long-running and multi-stage process. This process should consistently cover all areas related to the promotion of agricultural products, among which it is necessary to name such areas as transportation, processing, storage of products. The development and implementation of new machines and technologies will significantly increase the efficiency of using all types of the country resources.

The agrarian reform carried out at this stage is associated not only with investment and innovation activities of enterprises of the agro-industrial complex. It also affects the area of legal regulation of economic relations, optimization of the regulatory framework, measures of government support for agricultural enterprises, the formation of channels for resource provision of the economy agricultural sector, which, in general, will contribute to increasing overall attractiveness for all market entities in this sphere of the economy.

The formation of an efficiently functioning agrarian cluster of the national economy is based on the efforts of all participants of market relations, simultaneously realizing their economic interests and carrying out the mission of ensuring the country economic and food security.

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