Digital Development of Agrarian Production - Institutional Approach

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Abstract. The article assesses the digital transformation in relation to agriculture, especially on the basis of the technological diversity of agricultural production and crops and the associated diversity and labour intensity of production processes. The agri-industrial complex, always was a complex socio-economic system. It shall be recognized as the main and very important element of the national economy of the country, the main goals of the functioning of the complex are meeting the needs of the population in food and consumer goods from agricultural raw materials - grain, cheese, meat, butter, flour; it is necessary to create a food reserve that will ensure the country's food security for years; ensuring the efficiency of the agri-industrial system and various structures; meeting the economic and social needs of agricultural workers. It is important to develop the agricultural sector and this is the key to the prosperity of the economy of any state in the long term perspective. This is due to the consistently high demand for agricultural products. In each country, the agricultural sector of the economy is developed at different rates. Agriculture in Russia has already experienced a recession and is slowly improving its position.

1. Rationale
The innovative digital technologies of the 21st century hold enormous potential for economic growth through precision, automation and new control capabilities.

Currently, significant economic risks remain for agriculture. In their turn they reduce the sustainability of agriculture growth and the ability to solve problems associated with import substitution. The issue of food security remains one of the most urgent, since the low profitability of agricultural producers does not allow the formation of sufficient monetary resources for the implementation of technological modernization of production [1,2].
The potential of digitalization lies precisely in the weakening of target conflicts with the possibility of effective development of production, organization and management processes. This result is achieved on the basis of innovative technologies through highly specialized and targeted use of appropriate individual resources for the growth of production.

At the same time, due to its versatility, digital transformation provides the basis for sustainable development in the case of simultaneous increase in productivity in the production process. This argument is valid not only for the production process, but also for further processing: based on the acquisition and processing of data, it becomes possible to receive valuable relevant information into the production process and use it for appropriate optimization.

The agricultural sector is an important sector of the national economy and plays an important role in the economy of the Russian Federation. According to the Ministry of Agriculture of the Russian Federation, the following regions can be mentioned among the leaders in terms of the rate of implementation of digital approaches in agriculture: Altai and Krasnodar regions, Kursk, Lipetsk and Samara regions, the Republic of Bashkiria and the Republic of Tatarstan [3].

The objective of the study is to assess productivity growth and the potential for digitalization of sectors of the economy.

2. Analysis of the development directions of the digital economy in the agro-industrial complex

The current task and goal of the modern development of the agro-industrial complex in Russia is the balance of all its links. The lag in the development of processing industries leads to large losses of agricultural products, reaching within 30% of the harvested grain, 40% of harvested vegetables in all forms of ownership.

The importance of maintaining the vector for an innovative path of development with the use of digital technologies, including in the agro-industrial complex, is due to the prospects for increasing the competitiveness of domestic products and a significant increase in production volumes without harming the environmental component [4].

In the agro-industrial complex, there are also a number of problems that slow down its development. In recent years, the work on increasing the soil fertility and land reclamation has been practically suspended, the indicators of the use of organic and mineral fertilizers have decreased, which served to intensify the process of soil degradation [5].

In the current situation, Russia no longer has sufficient financial capabilities to purchase the required amount of grain, and the decrease in grain imports is compensated by an increase in the volume of purchases of finished food products.

Domestic animal breeding provides no more than 50% of the country's population needs for milk and meat. Agricultural engineering is developing poorly. The provision of agricultural machinery is only about 50% of the technologically necessary amount. Retirement of tractors exceeds renewal by 5 times, grain harvesters by 3 times, forage harvesters by 3.5 times. There are also problems in the provision of fuels and lubricants due to the financial condition of agricultural producers, as well as the rise in prices for petroleum products, compared with prices for agricultural products.

The efficiency of the agro-industrial complex is not measured only by the yield of agricultural crops. This concept is much and much broader, namely, it implies the possibility of obtaining additional added value due to the repeated use of primary agricultural raw materials and products of its processing. At the same time, it is important how this is implemented by fragmented small farms, or large economic organizations. It should be noted that small and medium-sized farms as an organizational form of management cannot solve these problems, since efficiency will be ensured only with an appropriate level of concentration of resources, management, and a unified strategic development policy.

Connections of a multi-link technological chain, starting from the preparation and growing of agricultural raw materials and ending with its deep processing within one economic organization, will reduce the cost of production first of all due to the:
The agrarian sector is an important backbone element of the economy of any state, including Russia\[6\].

In our country, the period of reform and modernization of agricultural production, which began in the early 90s of the last century, was very difficult.

### 3. Supporting the digital platform of agrarian economic of Russia

The transition of the agro-industrial complex to the use of digital technologies is due to the need to respond to a number of global challenges:

1. continuously increasing demand for agricultural products in the context of maintaining a sufficient imbalance between supply and demand leads to the sharpening of the problem of hunger; Producers’ capabilities are limited by the potential of the ecosystem and the technologies used;

2. instability of international food markets, which arises against the background of high competition and activity of speculative organizations. It is difficult for developing countries to compete with manufacturers of developed countries due to the introduction of trade barriers at the interstate levels, and dependence on technology imports also negatively affects;

3. one of the tasks is to overcome social resistance to the introduction of innovations and digital technologies, to eliminate the shortage of highly qualified personnel;

4. the development of the world system of the agro-industrial complex with an emphasis on globalization leads to the ousting of small agricultural producers from the market;

5. Mass production of products grown with the use of GMO technologies, in the structure of agricultural products in circulation on the international market, the share of food dangerous to humans is steadily increasing [7,8].

In the Russian economy, the introduction of digital technologies is carried out in all industries, this process is regulated by the government order No. 1632-r dated 28.07.2017. The importance of maintaining the vector for an innovative path of development with the use of digital technologies, including in the agro-industrial complex, is due to the prospects for increasing the competitiveness of domestic products and a significant increase in production volumes without harming the environmental component.

The government of the Russian Federation in its reports indicates that the volume of the digital economy has reached the level of 5% of GDP. Significant growth is noted in the e-commerce segment, information infrastructure is being actively created and optimized. The state focuses not only on building a new business model in agriculture, but also on the formation of efficiently functioning information products, electronic services, adaptation of the social sphere to the conditions of the digital economy [9].

Key directions for digitalization of economy and separate industries:
- standard and legal regulation;
- creation and optimization of informational structure;
- formation of a single information space [10];
- development of a training program for qualified personnel;
- ensuring information security;
- digital public administration
- creation of effective digital technologies.

Difficulties in creation of an effective mechanism for regulation of digitalization processes in the agro-industrial complex are due to the fact that transformations affect the principles of dealing with the most complex in the legal aspect objects of property law (land plots and natural resources, which fall into the scope of several types of law at once).

Currently, transformations in the agro-industrial complex are regulated by the Digital Agriculture program created by the Ministry of Agriculture. For this project in the period from 2019 to 2024, it is...
planned to allocate funds to optimize the information component in agriculture with the attraction of funding under state programs, from non-budgetary sources and from representatives of agribusiness. At the same time, less funds are actually spent on the transition of the agro-industrial complex to the active use of information technologies than in other industries [11,12]. A feature of the digitalization of agriculture has become the uneven use of digital technologies by farms of different categories.

With the digitalization of the agro-industrial complex, it is planned to develop several complex projects to increase productivity:

1. digital technologies in the management of the agro-industrial complex - the creation and implementation of analytical tools and specialized databases for software, hardware and information support for the management of the agro-industrial complex;
2. "Smart" land use - the creation and implementation of an intelligent system for planning and optimizing agricultural landscapes and land use in agricultural production at different levels of generalization (field, property, municipality, constituent entity of the Russian Federation, country, foreign territories), operating on the basis of digital, remote, geoinformation technologies and methods of computer simulation;
3. “Smart” field - ensuring stable growth in agricultural production of crop production through the introduction of digital technologies for collecting, processing and using an array of data on the state of soils, plants and the environment;
4. "Smart" garden - at least 90% of the area of perennial plantations in digital form in a single geographic information system; at least 70% of the area of industrial gardens shall be provided with means of collecting data on the state of soil, plants and the environment; at least 50% of the area of industrial gardens must be covered by a data transmission network to ensure the collection of large Data; at least 70% of mobile technical means will be equipped with monitoring systems and included in the unified geographic information system; at least 30% of technical means will be robotic;
5. "Smart" greenhouse - the development of a modern integrated technology of "smart" greenhouses based on the use of the Internet of things for food production, ensuring stable growth in crop production in protected ground, obtaining highly competitive substrates and fertilizers, domestic innovative systems (microclimate, lighting, efficient energy supply, universal module, food, autonomy, etc.) for closed ground, methods of product quality control, increasing the nutritional value of vegetables;
6. "Smart" farm - the creation of digital technologies that ensure the independence and competitiveness of the domestic livestock complex; creation and implementation of technologies for increasing the milk productivity of animals up to 13 000 l/year; reducing the incidence of mastitis in cows and, consequently, reducing the cost of antibiotics; creation and implementation of technologies for autonomous production (without an operator), energy efficiency and energy mobility in a “smart farm”; creation of safe and high-quality (functional) food products;
7. end-to-end technologies and the formation of research competencies. For the Ministry of Agriculture of Russia, in cooperation with the Ministry of Science of Russia and the Russian Academy of Sciences, it is advisable to create an industry platform that will provide a discussion of tasks for the development of digitalization of the agro-industrial complex, conduct and coordinate research and educational programs, implement pilot and business projects. develop the following end-to-end technologies: Internet of Things, RFID technologies, neural networks, big data, artificial intelligence, new production technologies, sensorics and components of robotics, Blockchain technology, contactless and remote technologies.

4. Findings
Thus, the effect of digitalization of the agro-industrial complex will not be complete if the state policy is built only on attracting additional investments into the industry. It is necessary to create conditions and a mechanism for interaction between business, science and educational institutions, which is important for the formation of intellectual cooperation and the development of integration processes in the implementation of innovations. Intellectual cooperation shall be understood as a system of
relations in society, accompanied by the pooling of knowledge to reduce the cost of each unit of manufactured products. Innovative integration is a system of relations built on the division of labour and the allocation of specializations of market entities for obtaining new products or raw materials. Not only Russia, but all agricultural enterprises in the world must equally accept these digitalization challenges in the process of market globalization. Mutual exchange, including at the international level, provides a great chance to use the accumulated experience in our country and to catch up the development level. And due to this, all participants in digital transformation can have benefits in the long term prospectve.

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