Legal support for the digitalization process of the agro-industrial complex: issues of theory and practice

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Abstract. The use of digital technologies in the agricultural sector is an essential condition for increasing the efficiency of its activities and competitiveness. The level of modern technology development allows Russia to use many innovative resources to increase agricultural productivity and product quality, attracting new investments in this area. The purpose of the study is a structural analysis of the legal support for the process of introducing digital technologies into the activities of the agro-industrial complex. The analysis showed that modern legislation has a fairly large list of strategic acts regulating the digitalization processes of various economic spheres, including the agro-industrial complex. At the same time, regulations that would consider in detail the implementation of digital technologies, the legal status of participants, and support measures from the state have not yet been adopted. The introduction of digital technologies into the activities of the agro-industrial complex is gaining momentum, which urgently requires the creation of a developed regulatory legal framework determining public relations in this area.

1 Introduction

Modern processes of globalization can be assessed in different ways, taking into account the numerous positive consequences and noting the accompanying negative trends. However, it is difficult to deny that the process of digitalization, which has covered all spheres of life, has become an integral factor in the global world transformation. Digital technologies are being introduced into all processes at an accelerated pace. The economic sphere was included in this process most dynamically because this sphere of social relations is the most sensitive to all global changes. Digitalization has naturally replaced informatization and should contribute to the active development of the most economic areas, including priority sectors, which also involve agriculture. The processes of globalization and the industrial revolution create fundamentally new conditions for the evolution of states and define new “bars” for the development of social relations.

2 Materials and methods

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To conduct a comprehensive study, the results of scientific, theoretical and practical research by specialists in the field of economics and legal sciences related to the peculiarities, which concern the introduction of digital technologies into economic relations, were used. Among them, it is necessary to note the works of N.N. Yurina, who substantively dwells on the analysis of the main directions for digitalization in agriculture in Russia, highlighting increasing productivity and reducing losses, since the introduction of digital technologies in these types of activities will give tangible results [1]. It is also worth noting that the work of Lyasnikov N.V. provides an overview of “breakthrough technologies of the fourth technological order” [2]. The legal position is represented by numerous authors, who for the most part mention that the legal regulation of the economy is a set of political, legal, social and other factors that mediate the action of legal norms, the purpose of which is to implement interdependent connections between economics and law [3, p. 142]. A.A. Darkov examined the use of digital technologies in the agricultural sector from the perspective of civil regulation. It is necessary to note the wide variety of scientific research related to the use of digital technologies in agriculture, which emphasizes the relevance of the topic in this work.

In the process of conducting the research, general scientific and specific scientific methods were used, which made it possible to comprehensively cover the theoretical and practical aspects of the issue under study. Since the processes of digitalization in the agro-industrial complex are of an applied nature, the use of such methods as analysis, synthesis, and systemic methods ensured conducting a theoretical generalization of practical results and presenting them as substantiated provisions. The functional and sociological method reflects the practical results of the introduction of digital technologies in the agricultural sector and enables the authors to analyze the positions of business entities using innovative implementations. The axiological method made it possible to identify the value and relevance of digital innovations in the modern system of economic interaction between subjects.

3 Results and discussion

As noted earlier, the digitalization process of the agro-industrial complex is based on two components – an increase in production and a decrease in costs. The positive experience of many foreign countries stimulates the demand in the agricultural sector for robotics, intelligent programs, and digital analytical systems. This is due to the fact that the introduction of technological tools can contribute to a significant reduction in labor costs in this area, where physical labor of workers is often used. The use of robotic mechanisms will simplify this process. Thus, digitalization of the agro-industrial complex is associated with changes in the quality and content of management of technological resources and decision-making processes in controlled systems. The introduction of digital tools entails a complete restructuring in the production and marketing of agricultural products, while, in theory, efficiency in indicators remain the same or increase.

Processes associated with the introduction of digital technologies lead to a qualitative change in social relations, which entails the need to update the mechanism and nature of legal regulation for issues related to the expansion of the Internet space, the introduction of new technologies, and the use of new technological systems. The main role in this process is played by the state, directing its efforts to increasing the efficiency of legal regulation in the field of economic relations, reasonably estimating the basic role in this system of interaction between subjects. The process of integration between information and legal systems changes the content and process of legal regulation in economic relations. If previously the essence of such legal regulation was the formation of favorable legal conditions for the functioning of the economic system and the creation of a stable legal framework, then in the terms of digitalization the essence of legal support lies in the implementation of goals and objectives aimed at regulating public relations that take a different shape under the influence of...
information and digital technologies, using both legal and non-legal means of influence. Thus, in the process of legal regulation two groups of means can be distinguished:

- legal means, which are elements of the mechanism for legal regulation of relations in the structure of the agro-industrial complex;
- non-legal means related to logistics, personnel, management, and information support.

Within the framework of this study, the content and effectiveness of the means for legal regulation are of interest. Legal means are quite diverse, but among them it is worth highlighting lawmaking, since it is the type of activity that creates the regulatory framework for the formation and implementation of the state’s legal policy in the field of agriculture, for creating development strategies in the agriculture and the agro-industrial complex as a whole. Over the past few years, legal documents have appeared that represent a set of strategic directions for the development of the agro-industrial complex in general and its structural elements in particular. This list of documents is updated annually with new programs, which emphasizes the state’s interest in the results of their application.

The following documents are of greatest interest:

- Strategy for the development of the information society in the Russian Federation for 2017-2030, approved by the Decree of the President of the Russian Federation on May 9, 2017 No. 203 [4]. This document establishes the definition of the digital economy, which is understood as economic activity aimed at processing large volumes of data, the purpose of which is to increase the efficiency of various types of production, technology, equipment, storage, sale, delivery of goods and services;
- Decree of the President of the Russian Federation of May 7, 2018 No. 204 “On national goals and strategic objectives of the development in the Russian Federation for the period until 2024” [5], in part 1, paragraph i) where as one of the directions for scientific and technological development in the Russian Federation the creation of a highly productive export-oriented sector based on modern technologies and with the involvement of qualified personnel is indicated, within basic sectors of the economy, namely the manufacturing industry, agro-industrial complex;
- National program “Digital Economy of the Russian Federation”, approved by the minutes of the Council Presidium under the President of the Russian Federation for Strategic Development and National Projects dated 06.04.2019 No. 7 [6], where one of the state’s tasks is to transform priority sectors of the economy, including manufacturing industry, agriculture, etc., through the introduction of digital technologies and platform solutions;
- project of the Agriculture Ministry of the Russian Federation “Digital Agriculture, with implementation period 2019-2024” [7], the goal of which was the rapid digital transformation of the industry through the introduction of digital technologies and platform solutions aimed at ensuring a technological breakthrough in the agro-industrial complex and achieving an increase in labor productivity in “digital” agricultural enterprises. According to the Center for Digital Transformation, in the agricultural sector by the second half of 2023, certain progress had been achieved - digital transformation teams consisting of competent specialists had been created, strategies and plans had been developed, and indicators had been clarified [8]. The number of regions that are trying to introduce digital tools at enterprises has increased, but the ultimate goal of doubling such enterprises has not yet been achieved;
- Decree of the Government of the Russian Federation dated November 23, 2023 No. 3309-r “On approval of the strategic direction in the field of digital transformation of the agro-industrial and fishery sectors in the Russian Federation for the period until 2030”, according to which the digitalization of services in the agro-industrial complex will be carried out in several stages and by 2028, the execution of all support measures will be completely digital.
These documents determined the directions for the development of the agro-industrial complex in the context of digitalization for the next few years, both at the federal level and at the level of the constituent entities in the Russian Federation.

Non-legal means of legal support, which are represented by various material, technical, organizational and managerial means, are also worth considering. They are quite diverse, but have a common goal of achieving a new, higher level of digitalization in the agro-industrial complex. Among the interim measures are the following:

- the use of robotic technology, which is aimed at reducing labor costs in agriculture. These include various mechanisms used for soil analysis, spraying field crops, crop monitoring, irrigation, etc. The use of such mechanisms allows you to obtain reliable information about the relevant processes, as well as apply the required measures, which significantly increases the overall efficiency of activities;

- the use of digital tools such as Internet of Things, Big Data, AI. They represent a network of connected objects that can store large amounts of data and exchange them using built-in services [9]. For example, sensors are now actively used, which are installed in the soil and allow obtaining data on humidity, temperature, soil illumination, etc.

- staffing also plays an important role [10]. To train specialists proficient in digital technologies and skills to use them, the educational platform “Land of Knowledge” was created, where educational materials from Russia’s leading agricultural experts on all topical issues are posted.

The program “Digitalization of Agriculture”, adopted within the framework of the aforementioned national project “Digital Economy of the Russian Federation,” actively promotes the use of various digital programs that can independently make certain decisions. Examples of such programs are “Smart Field”, “Smart Herd”, “Smart Greenhouse”, “Smart Agricultural Office”, etc. These programs have proven themselves positively in management activities, significantly facilitating the process of making significant decisions and reducing time costs [11]. As experts note, in the last few years there has been a clear increase in information resources on agriculture and other related issues [12]. Since the process of introducing digital technologies is quite dynamic, it is extremely important to create a new legal framework to regulate security issues when using digital tools, determine the legal status of participants in the process, and develop a support mechanism from the state.

In the ranking of digitalization in the agricultural sector, Russia took 8th place among the leading states, scoring a total of 27.2 points, while the leaders of the ranking (USA, Australia, Canada, Israel) scored 65 points and above [13]. Farmers in these countries have already realized the effectiveness of investing in digital technologies, which has resulted in an average increase in yields of, for example, 10% in the United States. In Russia today there are no such opportunities, which is due to the lack of specialists who are involved in the development and implementation of innovative technologies.

According to experts, in Russia there are two possible scenarios for the further development of the agro-industrial complex in the context of digitalization. According to the conservative scenario, large holdings of the agro-industrial complex continue to maintain low dynamics in the implementation of digital technologies for production; the state, in turn, continues to rely on control tools in the production and marketing of agricultural products. In this case, Russia, taking into account favorable conditions, continues to remain in the same place in the ranking.

In the second scenario, which is designed for a rapid transition to a new stage of development, a platform is created for storing and processing a large amount of data. The result is forming a common impersonal data bank used for the development of other government services. The focus is on supporting enterprises implementing digital technologies, and subsidies are allocated to the developers of innovative resources. In this case, Russia can significantly increase its rating by 2030, approaching the leading states.
If we focus on the scenario for active development and implementation of technological resources in the agro-industrial sector, by 2030 Russia can ensure an increase in labor productivity by 15% and in production volumes by up to 5%. At the same time, the cost of production will gradually decrease to 20% and the profitability of enterprises will increase. The introduction of artificial intelligence into the agricultural sector will reduce the time it takes to provide government services and shrink document flow. Entities involved in this area will be able to optimize their costs, thanks to modern technologies that increase yield growth, as well as enhance product sales using established channels, etc. In 2024, it is planned to complete the creation of a unified digital platform for the agro-industrial complex based on Russian software, which will allow farmers to submit all applications electronically and facilitate the collection of reports to government agencies.

But it is worth considering that the agricultural sector is quite conservative, so you should not hope for a quick change of the situation. Agribusiness, most often, is geographically distant from those centers where innovative developments take place, which prevents their direct testing and rapid implementation. There are more and more enterprises that are trying to use the achievements of science and technology to the best of their ability, but still their percentage remains quite low. For example, only 12% of companies in the agricultural industry use artificial intelligence, and just over 30% of enterprises are planning it. Unfortunately, this is less than half of all those enterprises that operate in the agro-industrial sector.

We can highlight circumstances that to a certain extent create barriers to the active use of digital technologies:

- due to the territorial characteristics of the state, many agricultural sites do not have the Internet, which significantly hinders the development and use of digital technologies. To neutralize this problem, it is necessary to provide stable communications to the main agricultural enterprises of specific regions;
- low IT literacy of the population. There are very few specialists in Russia who have the skills to create digital tools at the proper level, and even fewer who can implement them into practice. In the field of agriculture, developments from the 2000s are still used, since there are no skills and opportunities to introduce new technologies. This is also associated with staff shortages;
- keeping silent about technological developments and achievements of certain companies in order to maintain competitive advantages. Many technologies are created by special order of enterprises, but with the obligation of the contractor not to disseminate information about the project work and its results;
- lack of experimental sites where it is possible to test new technologies or production;
- the shortage of personnel in the agricultural sector is due to the low prestige of this profession, which is associated with low income levels, underdeveloped infrastructure and the lack of significant government support. An increase in government subsidies and the development of government programs to support the agricultural sector will attract new personnel to this area;

Despite the difficulties, introducing digital technologies into the agricultural sector is necessary and profitable. To implement the plans, to involve business entities in the digitalization process, the state must create the appropriate infrastructure, increase interest in this process and develop the necessary legislative framework. For this it is advisable:

- eliminate conflicts in legislation, update and finalize legal acts aimed at regulating the processes of using digital technologies;
- formation of a single data warehouse, which will facilitate the implementation of digital technologies;
- develop programs that encourage business entities to use digital tools in the process of business.
clarify the legal status of participants in the digital economy;
develop new grant programs for entities using digital innovations in agro-industrial activities, extend ongoing support programs;
create training centers for the introduction of digital technologies in agriculture;
determine test areas for testing robotic mechanisms and other technological tools;
simplify administrative procedures in regard to the use of unmanned aerial vehicles for agricultural purposes;
provide information and advisory support to interested parties that use digital programs and technologies.

4 Conclusions

At the end of the analysis, we would like to note that the legal regulation for the digitalization processes of the agro-industrial complex is carried out, to a greater extent, on the basis of program documents that are advisory in nature. To speed up this process, it is necessary to adopt regulatory documents on their basis that will consolidate the conceptual and categorical apparatus, thereby filling the gaps in the interpretation of new digital concepts and categories, the principles that should guide the subject in the process of introducing digital technologies into the agro-industrial complex. It is also necessary to formalize in legislation the content of the legal status for participants in legal relations, security measures during the implementation of economic activities and other issues that require legal regulation. The timely creation of a sustainable and relevant legal framework will create favorable conditions for improving the performance of entities from the agro-industrial complex in the context of digitalization.

References

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