Ensuring sustainable development of agriculture: legal, managerial, digital approaches

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Abstract. The article discusses modern legal, managerial, digital approaches to ensuring the sustainable development of agriculture. The norms and standards of agricultural risk insurance, budget lending, organic agribusiness modeling and food safety developed by international institutions are evaluated. Methods of comparative, legal, informational analysis and scientific generalization of theoretical knowledge revealed organizational problems of budgeting and quality control of agricultural products, preventing food losses, and combating falsification of food products. It was noted that legal measures and management standards optimize agribusiness segments, reduce the number of intermediaries, and improve the trust of suppliers and consumers through direct links. The digitalization of agriculture contributes to the transparency of data exchange while reducing information imbalances and transaction costs for participants in agricultural markets. The connection of standards and norms of legal regulation of sustainable development of agriculture with food security in the EU and the EAEU is shown. The conclusions are indicated by the positive prospects for digital management of agribusiness subsidies and digital budgeting as the level increases in the EU and the EAEU. Unlike the EU, the EAEU is building a common space for organic and digital agriculture on the principles of Eurasian integration and cooperation.
Keywords: organic digital agriculture, legal agribusiness, budget loans, insurance agricultural producers

1 Introduction

1.1 Substantiation of the relevance and novelty of the study.

The relevance and novelty of the topic is due to the need for a legal and economic substantiation of concepts related to ensuring the sustainable development of agriculture,

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agricultural territories and agro-industrial complexes while observing food and environmental safety standards. Experts focus on integrated approaches to the development of rural areas in the context of organic and environmentally friendly agriculture with a high degree of digitalization and state budget support. The mechanism of sustainable development is considered as a symbiosis of environmental, organizational and managerial, legal, information technology, financial and investment projects.[1].

The novelty of the study is due to the importance of studying the regulatory potential of legal norms in the field of agro-ecological business management and digital agriculture. The problems of assessing the harmful impact of agro-industrial enterprises on the environment according to agro-ecology standards in the EAEU and EU states are topical. The comparative analysis has shown that differences in standards hinder objective forecasts for the development of sustainable agriculture in different countries [2]. Analysts of agrarian law note the dynamics of the growth of legal norms for the transition to organic agricultural products [3].

To achieve the main goal of the work on the analysis of the organizational and legal foundations of greening, digitalization, risk insurance in agriculture, modern models of agro-ecological business management by the International Panel on Climate Change (EPIC) are considered. Italian experts C. Di Bene, M. Diacono, F. Montemurro, E. Testani & R. Farina note that such models take into account the vulnerability of the lands of the states of the Mediterranean basin, where the effectiveness of agro-ecological analysis of the consequences of climate change for growing organic vegetables is especially important [4]. The EU adopted the Regulation of the EU Parliament and the Council of the EU on organic agriculture, which performs the social function in the creation of ecologically clean agricultural landscapes, products, technologies to protect the environment and protect the health of citizens [5]. In Russia from 2018-2022 there are norms of federal laws on state financial and budgetary measures to stimulate the production of organic products in agriculture and support producers of agricultural products of improved consumer quality [6]. Digital agriculture of the Russian Federation is mentioned in the strategies for the development of its industries until 2030.

The study is based on the goals of the FAO UN Framework Program 2021-2031. and Recommendations of the UN Food Security Committee until 2030. on the introduction of rational production models for the effective and inclusive development of agriculture at the local, regional, global level. These models should ensure the sustainability of agro-food systems in the face of climate change [7]. FAO models are based on the key principles of food security and agricultural sustainability, most of which relate to responsible planned management of rational nature management with the development of organic agriculture, soil mineralization with transformed animal and crop waste [8].

The scientific significance is manifested in the fact that, based on the study of international expert assessments, innovations and contradictions in the introduction of insurance, environmental, digital innovations in agriculture have been identified. FAO experts N. Trendov, S. Varas, M. Zeng, assessing the potential of digital technologies in agriculture, note the problems of limited mass access of small farmers to digital technologies and the risks of a digital gap in electronic literacy [9].

Budgeting for digital agriculture is provided for by government acts and annual budget plans of the Russian Federation [10]. Experts, analyzing the Russian legislation on agriculture, note the stability of financial and legal measures to support innovation in the sustainable development of digital farming, crop and livestock technologies, monitoring digital platforms for agro-industrial processes (digital field, herd, machine and tractor desk, greenhouses, etc.). [11]. February 2020 the Ministry of Agriculture of the Russian Federation created the national platform «Digital Agriculture» [12].

1.2. Questions and structure of the study, hypothesis, goals, objectives

Research question 1: To analyze management models and administrative-legal approaches to the organization of agro-ecological business and organic agriculture.

Research question 2: Show the importance of digital innovation and digital agribusiness management in sustainable agriculture.

Research question 3: Define the functions of different types of food quality supervision, criteria for responsible behavior for the safety of agricultural products.

Research question 4: Determine the legal conditions for concessional lending, agribusiness risk insurance, and other measures of state support for agriculture.

The purpose of the work is to evaluate international and national legal measures and management models for environmentally friendly agro-industrial complexes in the development of digital agriculture. The norms and standards of organic agriculture, measures of budgetary support of states and digitalization of management are considered. The goal is achieved by comparing international and domestic standards of legal, managerial, informational practices in the EU and the EAEU in ensuring the sustainable development of agriculture. The tasks are defined by research questions. The hypothesis is related to the assessment of agrarian policy and legislative regulation of the conditions for improving the quality of life of citizens, employment of the rural population, and food security of states. The hypothesis of the study is expressed by the search for legal, digital, managerial models of agribusiness sustainability to climate change and the fight against air, water, and soil pollution. The article includes 5 sections: 1) introduction, 2) materials and methods, 3) research results, 4) discussions and conclusions; 5) conclusion. They include a hypothesis, goals and objectives of the study, methods for analyzing current problems, discussions and practical recommendations.

2 Materials and methods

Using the method of comparative analysis, the content of the concept of «sustainable development of organic agriculture» was studied on the basis of international FAO standards, technical regulations of the customs unions of the EU and the EAEU, norms and principles of food security, administrative, agricultural, informational, and budgetary law of states.

The method of analyzing the national management practice of digital agriculture concludes that the introduction of information and communication systems in rural areas depends on the level of budgetary security for the purchase of digital technological complexes.

By comparing international and legal norms of states on supervision of the impact of agriculture on food security in the EU, the EAEU, the levels of food control and sanitary and veterinary supervision in agro-industrial production are compared.

The method of informational and financial-legal analysis of the budgetary security of agriculture according to international standards and according to the EU and EAEU regulations marks the levels of subsidies, risk insurance and state certification of organic agricultural products.

3. Research results

In the study of «question 1» the methods of implementation of the FAO, the EU states and the EAEU of the goals of sustainable development of agriculture are compared by introducing management models and administrative and legal measures related to agro-environmental business and organic agriculture. The FAO Agriculture Strategy Guidelines 2019 [7], the International Federation of Organic Agriculture Movements (IFOAM) Guidelines for the Production, Processing, Labeling and Marketing of Organic Foods 2016 [13] were reviewed.

International Basic Standards Codex Alimentarius Commission 2020[13], Regulation of the EU Parliament and Council on the labeling of organic products 2018, Agreement of the EAEU on the recognition in the EAEU of organic products 2022 [14] were studied.

Basic norms, principles and standards of sustainable development for organic food products defined by the EU in 1999. (COROS and IFOAM standards). Sustainable agriculture in the EU since 2018 actively supported by subsidies, budget loans, tax preferences. In the EAEU by Russia, Kazakhstan, Belarus since 2018 there are laws on state support for organic agriculture [15]. In the EAEU since 2022 the provisions of the EAEU Agreement on the requirements for the production and labeling of organic products for the mutual recognition of certificates apply.

In the study of «question 2» on digital agriculture of the EU and the EAEU as a way to ensure the sustainability of agricultural development, general trends in management focus on the digitalization of organic agriculture were identified. The dependence of the level of digitalization of rural areas on the standardization of technical parameters of agro-complexes, greenhouses, pastures, farms, etc. is noted. The connection between digitalization and the level of budgetary provision of rural settlements and an increase in the effectiveness of control in the field of payments and information exchange is shown.

The comparative legal assessment method was used to analyze the regulatory legal acts of the EU and the EAEU, FAO, the International Telecommunication Union (ITU), which develop standards and principles for the management and information implementation of digital technologies to help farms, small agribusiness, and regional agro-industrial platforms. The EU is developing an exchange of best practices on the use of regional telecommunications networks and global platforms in local agro-ecological innovation.

Innovations in crop production, fisheries, and forestry have been noted, which create jobs and harmonize natural landscapes [16]. EU direct payments from the agricultural development budget are used to finance farms that apply sustainable and ecological agricultural standards for food safety, soil quality, animal husbandry and their pastures. In agricultural sector comprehensive scientific, technical and administrative measures for the digitalization of the are determined by the President of the Russian Federation in 2021 within the framework of the tasks of the state scientific and technical policy for the development of agriculture [17].

In the study of «question 3» on the legal conditions for subsidizing, lending, insurance of agribusiness, international documents and national acts of the EU and the EAEU are considered. Climate change risks and threats to food security have stepped up the adoption of regulations on digital agriculture, risk insurance and concessional lending in agriculture with state damage compensation and budget support. In Russia, the risks of destruction of agricultural crops, plantations of perennial plantations, the risks of damage to livestock and fish farms are insured by the repayment of loans by the state to agricultural producers [18].

An example of an international budgeting document for the agricultural sector is the FAO Guidelines 2021. on public spending on agriculture, which includes their classification, specification, standardization[19]. In Germany, large public subsidies are provided for organic agriculture, which is linked to the EU Directives on agricultural subsidies. According to the German expert Harald Ulmer, European agricultural policy is aimed primarily at the development of rural areas [20].

By order of the Ministry of Agriculture of Russia dated 04.05.2022 No. No. 274 the list of areas related to the conditions of preferential investment lending to agriculture was approved. Budget loans are allocated to agricultural producers of primary and subsequent processing of crop and livestock products of organic agriculture. The document defines measures to support software products for informatization and digitalization of agricultural production and products of its processing.

When studying «question 4», within the framework of the working hypothesis, FAO documents, acts of the EU and EAEU states on food security, supervision of certification of environmentally friendly products with budget support and state insurance of agricultural risks were considered [21].

The EU has general and specific standards for the production of safe food products. By the Regulation 2018 of the EU Parliament and the Council of the EU general food safety standards are approved. At the same time, the EU allows agricultural corporations and private enterprises to be guided by additional standards of national associations of agricultural producers for assessing the nutritional quality of organic farming products. National standards may be more stringent than those common in the EU [13, p.30]. For example, in Germany more stringent private organic labels and standards are applied, which are the property of farmers' associations Bioland, Demeter, Naturland, Gaa, Biopark.

Within the framework of the EAEU, food safety supervision is provided for by the Technical Regulations of the Customs Union TR TS 021/2011 «On Food Safety» (as amended on July 14, 2021). According to the technical regulations of the EAEU, developments related to new food products, agro-technological processes for their manufacture must be documented by licenses of the agricultural sanitary and epidemiological supervision authorities, consumer supervision of the EAEU states for the purpose of food security. The Federal Service for Veterinary and Phytosanitary Surveillance of Russia supervises the safety of agricultural products [22].

4. Discussions and conclusions

The debatable managerial and legal aspects of sustainable development of agriculture are the problems of insuring the risks of reduced yields, losses and damage to agricultural products during their collection, storage, transportation, and sale in the trading network.

Agribusiness experts L.Ulibina, O.Okorokova, Y.Turaev, analyzing the risk insurance of large and small agro-industrial companies, note differences in production and marketing management models, in risk indices of crop losses during harvesting and transportation, and the amount of insurance compensation. Insurers take into account the standards of national associations of insurers and FAO standards, but the sums insured often amount to 80% of the insurance cost of the risks of loss of agricultural products [23]. The problems of preventing food losses remain difficult. Such losses of agricultural products occur at the stages of harvesting, catching, sorting. FAO in 2022 developed the Voluntary Code of Practice for the Reduction of Food Loss and Waste, the purpose of which is to formalize guidelines and standards for the reduction of food loss and waste [24]. In Russia, the legal aspects of protecting the quality and safety of food products are regulated by a special law. However, the law does not include some of the conditions for preventing food spoilage and loss recommended by the FAO.

"Flexible" are the criteria for applying "soft" and "hard" measures of responsibility of manufacturers and suppliers for violations of the rules for the production of environmentally friendly and safe meat and vegetable products, given the large scale of falsification of food products. As part of the European discussions, experts I.Dererer, B. Panea, G.Ripoil note the need to increase the level of state and public control in the EU over the quality of agricultural meat products. This is facilitated by independent examinations and competitions with the assignment of federal and regional quality marks [25]. However, food security control is complicated by differences in the forms of control over the quality of animal feed at the national level. Digital certification, digital customs control, control of organic raw materials and agribusiness products are becoming more effective[26].

5. Conclusion

1. According to the norms and standards of the EU, there are several information systems in agriculture, including information and financial control over payments and data circulation on information and communication technologies.

2. The states of the EU and the EAEU should intensify the use in management practice of the principles of FAO on digital agriculture, the International Federation of Organic Agriculture Movements (IFOAM), the Food Code Commission.

3. The sustainable development of agriculture depends on the models of management and control over all stages of the turnover of agricultural products from its production to its consumption, which differ in the EU and the EAEU. According to FAO estimates, the food security of states depends on the level of food losses at different stages of production and consumption of agricultural products.

4. Digital management within the food, processing, fishery complexes is based on the standards of financing technologies for modeling and forecasting digital backups. This also applies to artificial intelligence, agricultural robotics and other digital technologies in agriculture, regulated by the laws of the EAEU states.

5. At the national level, responsibility for the quality and safety of raw materials, marketing, transportation, insurance base of meat, dairy and other food products should be strengthened.

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