SUSTAINABLE DEVELOPMENT OF AGRICULTURAL COOPERATION IN CONDITIONS OF ECONOMY DIGITALIZATION

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ABSTRACT

Introduction: The key link in the agro-industrial complex is agriculture. Cooperation is assigned a unique role as a factor contributing to the sustainability of the agricultural sector. The article aims to study the trends in the development of agricultural cooperation in the context of the digitalization of the economy, and identify problematic elements of development and determine the development trend for the future.

Theoretical framework: The theoretical basis of the research was formed by the scientific works of leading domestic and foreign scientists on the considered research problem.

Methodology: The research used methods of analysis and synthesis of economic information, statistical data, an integrated and systematic approach to assessing economic phenomena. The research used literature review, data analysis and synthesis as key methods to analyze trends, identify problems and draw conclusions.

Results and Discussion: The article discusses the existing positive shifts in the agricultural sector and why they do not provide desired dynamic development of agricultural producers. It identifies problems that slow down integration into the digital ecosystem and discusses certain problems that do not allow to increase production efficiency.

Conclusion: The key factors in the development of agricultural cooperation are identified. Conditions necessary for further development of agricultural cooperation are outlined, including effective involvement of representatives in the digital ecosystem.

Keywords: agricultural cooperation, digitalization of the economy, open innovation, production cooperative, state program, sustainable development.

Received: 18/09/2023
Accepted: 18/12/2023
DOI: https://doi.org/10.55908/sdgs.v1i12.2362
DESENVOLVIMENTO SUSTENTÁVEL DA COOPERAÇÃO AGRÍCOLA EM CONDIÇÕES DE DIGITALIZAÇÃO DA ECONOMIA

RESUMO

Introdução: O principal elo do complexo agroindustrial é a agricultura. À cooperação é atribuído um papel único como fator que contribui para a sustentabilidade do setor agrícola. O artigo visa estudar as tendências no desenvolvimento da cooperação agrícola no contexto da digitalização da economia, identificar elementos problemáticos do desenvolvimento e determinar a tendência de desenvolvimento para o futuro.

Estrutura teórica: A base teórica da pesquisa foi formada pelos trabalhos científicos dos principais cientistas nacionais e estrangeiros sobre o problema de pesquisa considerado.

Metodologia: A pesquisa usou métodos de análise e síntese de informações econômicas, dados estatísticos, uma abordagem integrada e sistemática para avaliar os fenômenos econômicos. A pesquisa usou revisão de literatura, análise de dados e síntese como métodos-chave para analisar tendências, identificar problemas e tirar conclusões.

Resultados e Discussão: O artigo discute as mudanças positivas existentes no setor agrícola e por que elas não fornecem o desenvolvimento dinâmico desejado dos produtores agrícolas. Identifica problemas que retardam a integração no ecossistema digital e discute certos problemas que não permitem aumentar a eficiência da produção.

Conclusão: São identificados os principais fatores no desenvolvimento da cooperação agrícola. São descritas as condições necessárias para um maior desenvolvimento da cooperação agrícola, incluindo a participação efetiva dos representantes no ecossistema digital.

Palavras-chave: cooperação agrícola, digitalização da economia, inovação aberta, cooperativa de produção, programa estatal, desenvolvimento sustentável.

1 INTRODUCTION

Agricultural cooperation plays a vital role in ensuring sustainability and development of the agricultural sector. However, in the context of rapid digitalization of the economy, agricultural cooperation in Russia is facing challenges in integrating into the digital ecosystem. While projects like "Digital Agriculture" are promoting digital technologies in agriculture, their impact on cooperation is unclear.

Previous studies have extensively examined various aspects of agricultural cooperation such as its benefits, types and state support mechanisms. However, there is lack of research analyzing the trends, issues and future development of cooperation specifically in the context of digitalization of the economy. This represents a clear research gap.

The aim of this research is to study the trends in development of agricultural cooperation in Russia in the context of digitalization of the economy. The study seeks to
identify problematic elements hindering its development and determine conditions necessary for its effective future growth.

The research uses both qualitative and quantitative secondary data analysis methods. Official statistics on cooperation over years are analyzed using descriptive analysis. A systematic literature review of academic papers and government reports is also conducted to understand trends and issues.

The research contributes to existing knowledge by providing a comprehensive analysis of agricultural cooperation in the emerging context of digital economy. It identifies specific challenges cooperation faces in integration. The study also outlines policy recommendations to ensure its sustainable development going forward in line with digital transformation of agriculture.

2 THEORETICAL FRAMEWORK

The findings of this study would help policymakers design targeted support mechanisms for cooperation to harness opportunities of digitalization. It would also benefit cooperation practitioners and farmers to understand reforms needed.

Agriculture is the core of the agro-industrial complex, which has a fundamental impact on food security, development of the territory, both in socio-economic and geopolitical terms. Outstanding Russian scientist A.V. Chayanov as early as the beginning of the twentieth century, argued that a joint association aimed at the production and sale of products by peasants contributes to the most efficient management of the economy, not replacing or substituting the role of everyone in the common cause, but acting as an addition to the peasant economy, serving it (Chayanov, A.V. 2014).

The origin of the cooperative movement and its formation is due to the desire of the Soviet government to rapidly modernize agriculture, increase its productivity and have clear command and administrative levers of management. At this time, collective farms, state farms, district and general agricultural enterprises (Minakov, I.A. 2016, Tkach, A. V. 2006) were actively developing, which to a greater extent took the role of a link between the growing population of the city and the peasant, ensuring food security (forecasted sales of agricultural products).

The established ties were destroyed during the perestroika period, which became one of the reasons for the crisis in agriculture, while we note that the state actively supported the farmers, and practically did not support the remaining collective farms
during the perestroika period, as well as various types of cooperatives. The formation of modern agricultural cooperation begins with the adoption of the Federal Law "On Agricultural Cooperation" in 1995, the essence of which has not changed constructively even today.

The adopted priority national project "Development of the agro-industrial complex until 2010: a priority national project (n.d.) Retrieved from https://mcx.ru", to a small extent stimulated the development of the cooperative movement to a greater extent on paper. However, over a considerable number of years, the tendency for the development of cooperation in rural areas has been minimal and only recently has begun to revive with great difficulty.

The experience of advanced countries, a number of foreign and domestic scientists (Strus, M.; Kalisiak-Mędelska, M.; Nadolny, M.; Kachniarz, M.; Raftowicz, M. 2020, Balogh, P.; Bujdos, A.; Czibere, I.; Fodor, L.; Gabnai, Z.; Kovach, I.; Nagy, J.; Bai, A. 2020, Petrikov, AV 2016), among other things, demonstrate a predisposition of cooperation to ensure the sustainability of an enterprise in the long-term, a decrease in transaction costs, ensuring a significant increase in labor productivity with a simultaneous growth of jobs, joint accumulation of financial resources to modernize the material and technical base, as well as maintaining the territorial content of rural areas.

The most interested in the development of cooperation are small farms, as well as personal subsidiary plots, due to the fact that the association gives them the opportunity to occupy competing positions in different areas of their activities.

Most scientists support the ideas of agricultural cooperation, leaving debatable methods, methods of support and changing priorities between production, processing and marketing cooperation (Petrikov, A.V. 2016, Sidorkina, M. Yu. 2017, Ishkova, E. 2016)

At the present stage, support for consumer and sales cooperation is declared to a greater extent, however, without a sufficient number of production cooperatives, the development of the first two has little presentable prospects. According to Russian legislation, agricultural cooperation is a system consisting of agricultural production and agricultural consumer cooperatives and their unions (Federal Law Russian Federation of No. 193-FZ of December 08, 1995 "On Agricultural Cooperation" (as amended) Moscow, Russia). Cooperation fully defends the interests of farmers, but it develops extremely slowly and does not use advanced management methods (Petrikov, A.V. 2016).
Few people pay attention to the fact that the modern development of agricultural cooperation takes place in the context of the digitalization of the economy, open innovations in which the formation of interaction between agricultural actors and key economic agents takes place in the context of the formation of a digital ecosystem of both the region and the country.

3 METHODOLOGY

This study aims to study the trends in the development of agricultural cooperation in the context of the digitalization of the economy, and identify problematic elements of development and determine the development trend for the future.

The theoretical and methodological basis of the research was formed by the scientific works of leading domestic and foreign scientists on the considered research problem. The research used methods of analysis and synthesis of economic information, statistical data, an integrated and systematic approach to assessing economic phenomena.

After the adoption of the Federal Law "On Agricultural Cooperation" in 1995, the dynamics of growth of agricultural cooperation was outlined in Russia, however, which did not have a clearly pronounced trend towards an increase in cooperatives, which was due to the low attractiveness and bureaucratic labor intensity of this form of management when attracting state support funds.

In European countries, state intervention in the development of the agricultural sector, according to the concept and methods used, is not something temporary, of an impulsive nature, but is a comprehensive systemic management of the agricultural sector. The fundamental ideas underlying such management are aimed at regulating agricultural production, coordinating production and marketing. You also carry out widespread control of the organizational and economic structure of the actors in the agricultural sector, in particular, the full encouragement of cooperation (both vertical and horizontal integration. As a result, the state has a direct impact on the specialization of agricultural production.

In the Russian Federation, the following dynamics of agricultural cooperation was traced: 1995. 7399 cooperatives, 2005 14572 cooperatives, 2010 12190 cooperatives, 2016 8405 cooperatives, 7,306 agricultural cooperatives are registered in 2019. Throughout the entire modern period of agricultural cooperation, there has been a decrease in the number of agricultural cooperatives. Note that, according to operational
In 2022, there has been a growth in agricultural cooperatives in Russia compared to a year earlier. The Ministry of Agriculture of the Russian Federation has prepared a rating of working agricultural cooperatives, the first place belongs to the Lipetsk region with the number of functioning cooperatives more than 700 units, the Penza region takes the second place with the number of more than 480 units, the third place belongs to the Republic of Sakha (Yakutia), where there are already only about 160. This allows us to make a conclusion about the heterogeneous structure of filling the territory with agricultural cooperation.

The agricultural sector is the least susceptible to rapid innovative innovations due to a number of features, such as significant financial costs, manual labor - not being involved in the information flow, the fundamental features of the mentality of workers in this industry, and a number of others. On the part of the state, attempts are being made in the context of the digitalization of the economy, to intensify activities to attract agricultural producers, including members of agricultural cooperation, to this area.

The digital economy, which operates in accordance with the Decree of the President of the Russian Federation of May 7, 2018 No. 204 "National and strategic objectives for the development of the Russian Federation for the period up to 2024" (Digital economy of the Russian Federation (b. D.). Received from https://digital.gov.ru/ru/activity/directions/858/) in fact, the promotion of the tasks of introducing digital technologies into the socio-economic sphere. It provides for the following areas of regulatory regulation of the digital environment, personnel for the digital economy, information infrastructure, information security, digital technologies, digital public administration.

During the implementation of the national program, conditions have been formed for a large-scale systemic digital transformation of industries and sectors of the economy. Having analyzed this national project, we do not find a clear-cut basis for transferring the agricultural industry to the digital economy.

Note that the Departmental project "Digital Agriculture" of the Ministry of Agriculture of the Russian Federation proposes the creation of "Superservice" (nd). Retrieved from https://www.mcxac.ru/o-tsentre/novosti/1129/), the goal of which is the digital transformation of agriculture through the introduction of digital technologies and platform solutions to ensure a technological breakthrough in the agro-industrial complex and achieve growth in labor productivity, to a greater extent determines the
introduction of innovations into the material base of agricultural producers, without affecting in detail the socio-economic sphere.

Note that, in our opinion, it is important that this project provides for digitalization not only of business entities, but also of the agro-industrial complex management system itself.

The project "Digital Agriculture" aims to act as a connecting link, a conductor, create all conditions for attracting digital technologies to the development of the industry, preparing representatives of the agricultural sector of the economy for an evolutionary transition, minimizing technical backwardness, but this project does not provide for the postulates of transformation, into the emerging digital economy of the country, especially the elaboration of any peculiarities regarding agricultural cooperation.

In the majority of the constituent entities of the Russian Federation, centers of competence in the field of agricultural cooperation have been created and are functioning, which are entrusted with the duties of consulting, informing, providing methodological services for the subjects of the agrarian sector of the economy of various levels, but to a greater extent designed for small and medium-sized businesses, agricultural cooperatives, and personal subsidiary plots.

Having considered the key tasks of the established centers for our country, which include the provision of free-of-charge consulting services on the creation of peasant (farm) farms, agricultural cooperatives, consultations, assistance with obtaining grants, obtaining state support, reporting and conducting economic activities, there is no clear statement creation of comprehensive conditions for the conductor of the foundations of digital development enshrined in the project "Digital Agriculture" for agricultural cooperation in the context of the digitalization of the economy.

The competencies of the agrarian digital economy are formed at the intersection of three areas - management, information technology and economics, presented in Figure 1.
The synergistic effect arising at the intersection of the presented areas, based on new tools for communication, providing information, receiving a variety of services, promoting the sale of products, in the field of interests of agriculture provides interaction on new principles.

Such changes are inevitable, based on new communication tools (e-government, social networks, digital platforms), between actors (companies - individuals and legal entities) and government authorities, financial and credit authorities and others.

The emerging competencies of the agrarian digital economy are replacing the old established models, forcing the actors of the agricultural sector to undergo a transformation process in the field of digitalization of the economy, while the old models do not disappear without a trace, but organically coexist with the new models that are replacing them.

In the context of the formation of the digital economy, the ecosystem of the region is the allocation of three contours presented in Figure 2: federal, regional, subsystem. The allocation of a subsystem contour is expedient in connection with the previously justified need to deviate from the sectoral approach in favor of structuring the regional economy from the position of groups of subjects interested in its development (behavioral type of the structure of the regional economy), demonstrating active behavior and participating in management interaction.
Inner contour - group interaction of elements of the regional socio-economic subsystem; the central contour is the regional level of management interaction; rounded outline - digital ecosystem of the region; external circuit - federal level of management interaction

In this regard, the subsystem contour acquires the boundaries of the socio-economic subsystem of the regional economy, in relation to the formation of the digital ecosystem of the region.

In order to ensure the formation and development of the digital economy within the ecosystem of the region as a subsystem of the regional socio-economic system, in the process of coordinated and ordered interaction of its elements, aimed at increasing the level and quality of life of the population, it is necessary to use a set of state regulation tools, grouped according to the following criteria: economic, fiscal, legal, institutional, institutional and infrastructural, administrative (Sirotkina, N.V. & Lanskhkh, E.A. 2011, Kolmykova, T.S. & Polyatykina, E.V. 2017, Amirova, E.F., Kirillova, O.V., Kuznetsov, M.G., & Gazetdinov, Sh.M. 2020).
4 RESULTS AND DISCUSSION

The authors could suggest a discussion on how artificial intelligence technologies are being adopted by financial institutions to drive process innovation (Almustafa et al.) and suggest reviewing corporate liability and contract laws from perspective of cooperation-industry partnerships on digital projects (Agustina et al.). Authors could consider how consumer preferences and differentiation impact adoption of digital technologies and business models (Rodionov et al. 2022), the potential of social media data and digital avatars in creating personalized user profiles (Rodionov et al. 2023), and demand-driven methods to complement their supply-side policy focus (Yuldasheva et al. 2023).

The authors could also discuss the existing positive shifts in the agricultural sector, the agricultural sector of the country, that do not provide the desired dynamic development of agricultural producers of small forms of business, cooperation, and even more so do not ensure their integration into the digital ecosystem at the proper level, which is associated with a number of problems. These include:

- most of the cooperatives are created to receive state support, grants for development, and not aimed at effective entrepreneurship in the field of agriculture;
- poor awareness of the rural population about the cooperative movement;
- lack of elaboration of involvement by the state of actors of agricultural cooperation in the digital ecosystem of the region and their weak incentive interest to change something due to the specifics of agricultural activities;
- lack of practice of using open innovations by agricultural cooperatives;
- imperfection of the regulatory framework in the field of cooperation.

At the same time, certain problems do not allow to increase the production, economic efficiency of the activities of the actors of agricultural cooperation:

- insignificant access to financial and credit resources;
- unstable and poorly predictable macroeconomic conditions market;
- rise in prices of monopolists;
- weak impact on the activities of the cooperative of regional and state bodies in order to stimulate the transition to "digital" in agriculture.
The solution of these problems will speed up the process of the cooperative movement in our country. In the context of open innovation, the paradigm should be the formation of ecosystem interaction of agricultural cooperatives as actors and main economic agents, ensuring the rapid and efficient implementation of projects, which will ensure sustainable development of both an individual agricultural cooperative and the industry as a whole.

5 CONCLUSIONS

In conclusion, based on the analysis carried out, it can be concluded that the key factors in the development of agricultural cooperation were the remaining resources (material, financial, labor); promotion of product sales through the creation of agricultural markets, fairs; support of the activities of cooperatives by specialized auditing unions, aimed at maintaining, supporting and protecting the interests of cooperatives; creation of centers of excellence developing the provision of a whole range of various services to production, processing, marketing agricultural cooperatives and peasant farms.

For the further development of agricultural cooperation, it is necessary to fulfill a number of conditions, namely: being in the core - management of the cooperative of its really interested members who have professional management skills; stable membership in the cooperative; economic benefit - "transparent" calculation and payment of remuneration for membership and effective work in the cooperative; expansion of sales markets for agricultural cooperation products, improvement of transport and logistics ties; provision of preferential terms in confirming the quality of produced and sold products of agricultural cooperation, comprehensive support both at the regional and federal levels, as well as integration, effective involvement of representatives of the agricultural sector of the regional economy and, of course, representatives of agricultural cooperation in the digital ecosystem of the regions.

Currently, there is an increase in support for agricultural marketing cooperation from the Ministry of Agriculture of the Russian Federation and regional authorities (Kuznetsova, E. G., Yakovlev, G. E. 2018).

To a greater extent, this support is based on the allocation of grants, at the same time, at their expense it is impossible to solve all the problems of cooperation, it should be expanded and supplemented with other measures aimed at the sustainable development of agricultural cooperation, popularization of the ideas of the cooperative movement,
creation of a sustainable infrastructure for the development of cooperation. Further development is impossible without the reliable establishment of production cooperation, marketing, and, provided they function effectively, stimulation of export cooperatives, which must certainly be supported by various instruments and methods from the state.

This study aimed to analyze the trends and issues pertaining to development of agricultural cooperation in Russia in the context of ongoing digitalization of the economy. Based on the analysis of secondary data and literature review, several key findings and conclusions can be drawn:

1) The review of statistics and past studies showed that while cooperation played an important role historically in Soviet era, its growth has been inconsistent and declining in recent decades. Digitalization now presents both opportunities and challenges for its revival.

2) Major problems hindering cooperation's integration digitally were identified as lack of awareness, focus on state aid over entrepreneurship, limited access to finance and weak incentives for adoption of innovations. Macroeconomic instability and rising input costs further affect viability.

3) The projects "Digital Agriculture" and centers of competence were found to focus more on individual producers and businesses rather than addressing cooperation's specific needs holistically. The competencies at the intersection of management, IT and economics required for digital economy were also not fully realized.

4) Fulfilling conditions like having professionally managed membership-driven cooperatives, stable markets, logistics and preferential support mechanisms were outlined as necessary for cooperation's further growth. However, the current support remains limited in scope compared to advanced countries.

5) In the emerging regional digital ecosystems, cooperatives need to actively participate through innovative business models. While challenges exist, harnessing open innovation holds promise if conducive environment is ensured.

6) To conclude, agricultural cooperation in Russia has immense untapped potential for sustainable development and contributing to food security. However, its effective integration into the digital economy necessitates a reliable long-term support mechanism informed by its requirements in the evolving context.
Overall, the study provides a comprehensive analysis to further the understanding of cooperation trends and policy reforms required. It also sets the stage for future case-study based research on specific regional/sectoral best practices.

**ACKNOWLEDGMENTS**

The work was carried out within the framework of the implementation of the development program of the Federal State Budgetary Educational Institution of Higher Education "South-Western State University" of the project "Priority-2030".
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